

**DEVELOPMENT AND VALIDATION OF A LOCALISED SUSTAINABLE
DEVELOPMENT GOALS FRAMEWORK FOR QUALITY EDUCATION
AND EVALUATING ITS EFFECT ON STUDENTS FROM
TRIBAL COMMUNITIES IN ATTAPPADI**

*Thesis submitted to the
University of Calicut for the award of the degree of*

DOCTOR OF PHILOSOPHY IN EDUCATION

by

SUKANYA K. U.

University Registration U.O. No.17235/2022/Admn.

Supervised by

Prof. (Dr.) SEEMA MENON K. P.

Professor



**NSS Training College, Ottapalam
Research Centre in Education
University of Calicut
2026**

DECLARATION

I, **SUKANYA K. U**, hereby declare that the work presented in the thesis entitled “Development and Validation of a Localised Sustainable Development Goals Framework for Quality Education and Evaluating Its Effect on Students from Tribal Communities in Attappadi” is based on the original work done by me under the guidance of **Prof. (Dr). Seema Menon K.P.** Professor, N.S.S. Training College Ottapalam and has not been included in any other thesis submitted previously for the award of any degree. The contents of the thesis have undergone plagiarism check using iThenticate software at C.H.M.K. Library, University of Calicut, and the similarity index was found to be within the permissible limit. I also declare that the thesis is free from AI generated contents.

Place: Ottapalam
Date:

Sukanya. K. U.
Research Scholar


Dr. Seema Menon. K. P.
Research Supervisor

Dr. SEEMA MENON K P
Professor
NSS Training College, Ottapalam
Palakkad, Kerala-679101 Research Centre in
Education, University of Calicut

CERTIFICATE

I, Prof (Dr.) SEEMA MENON K.P., do hereby certify that the thesis entitled **“DEVELOPMENT AND VALIDATION OF A LOCALISED SUSTAINABLE DEVELOPMENT GOALS FRAMEWORK FOR QUALITY EDUCATION AND EVALUATING ITS EFFECT ON STUDENTS FROM TRIBAL COMMUNITIES IN ATTAPPADI”** is a bona fide record of the research work done by **Ms. SUKANYA K. U.**, under my guidance and supervision for the award of Degree of Doctor of philosophy in Education of Calicut University. No part of the thesis has been submitted for the award of any degree, diploma or any other similar title of recognition in any other University before. The thesis is revised as per the modifications and recommendations reported by the adjudicators. Soft copy attached is the same as that of the revised copy.



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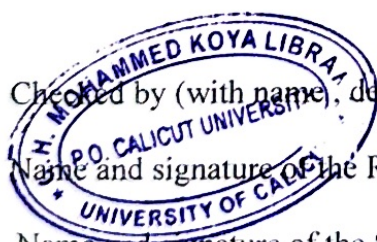


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3.	Name of the Supervisor	Dr. Seema Menon K.P, Professor, Department of Education, N.S.S Training College, Ottappalam, Palakkad.	
4.	Department/Institution	Department of Education, N.S.S Training College, Ottappalam, Palakkad.	
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Assistant Librarian

University of Calicut, Kerala.

Name and signature of the Researcher

SUKANYA K.U.

Name and signature of the Supervisor.

Prof. (Dr.) Seema Menon. K. P

Professor & Research Supervisor

Department of Education

NSS Training College Ottappalam

Research Centre in Education Kerala -879101

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Dr. Smitha. R

Principal -in-charge

Drawing and Disbursing Officer

Professor of Phys

N.S.S. Training College

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Place: Ottapalam
Date:

Sukanya K. U.

ABSTRACT

Quality education is central to sustainable human development and social equity, as emphasized by Sustainable Development Goal 4 (SDG 4). However, tribal communities in India continue to experience persistent educational disadvantages arising from socio-economic marginalization, linguistic barriers, geographical isolation, and limited access to culturally responsive schooling. In Kerala's Attappadi region—inhabited primarily by Kurumba, Muduga, and Irula tribal groups—these challenges are reflected in lower academic achievement, weak life skills, and fragile teacher–child relationships despite multiple government interventions. While global and national SDG frameworks articulate broad educational objectives, there remains a significant gap in translating these goals into locally relevant, measurable, and actionable educational strategies.

The present study aims to develop and validate a Localized Sustainable Development Goals (LSDG) Framework for Quality Education and to evaluate its effect on tribal students' learning quality, academic achievement, and life skills in Attappadi. The study adopts a mixed-methods research design with a single-group pretest–posttest and repeated-measures framework across three phases: pre-implementation (2022), mid-implementation (2023), and post-implementation (2024). A representative sample of 1,259 tribal students across Lower Primary, Upper Primary, and High School levels was selected from government and government-aided schools.

The LSDG framework was constructed by localizing SDG 4 indicators into context-specific educational variables, focusing on teacher–child relationships, learning quality, academic achievement, and life skills (problem-solving, critical thinking, and creative thinking). Data were collected using standardized and validated tools, including the Teacher–Child Relationship Scale (TARC), Learning Quality Assessment Tool (LQAT), and Life Skills Assessment Test (LSAT), supported by interviews and document analysis. Content validity was established through expert

review (CVI = 0.91), and internal consistency was confirmed through Cronbach's alpha coefficients.

Quantitative data were analyzed using Repeated Measures ANOVA, Bonferroni post-hoc tests, and Partial Eta Squared to determine changes across the three phases, while qualitative data were thematically analyzed to capture stakeholder perspectives and classroom practices. The study is grounded in a rights-based and human development approach, aligning educational quality with equity, inclusion, and community participation.

The study is expected to demonstrate that localized SDG-based educational governance leads to significant improvements in teacher–student relationships, learning environments, academic performance, and life skills among tribal students. By bridging global SDG principles with grassroots educational realities, the LSDG framework offers a scalable, evidence-based model for strengthening quality education in marginalized and indigenous contexts, thereby advancing the SDG commitment of leaving no one behind.

സംഗ്രഹം

അട്ടപ്പാടിയിലെ ഗോത്രവർഗ വിഭാഗത്തിൽപ്പെട്ട വിദ്യാർത്ഥികളുടെ വിദ്യാഭ്യാസ ഗുണനിലവാരം ഉയർത്തുന്നതിനായി പ്രാദേശികവൽക്കരിച്ച സുസ്ഥിര വികസന ലക്ഷ്യങ്ങളുടെ (Localized Sustainable Development Goals - LSDG) ഒരു ചട്ടക്കൂട് വികസിപ്പിക്കുകയും അതിന്റെ ഫലപ്രാപ്തി വിലയിരുത്തുകയും ചെയ്യുക എന്നതായിരുന്നു ഈ പഠനത്തിന്റെ പ്രധാന ലക്ഷ്യം. ഇതിന്റെ സംഗ്രഹം താഴെ നൽകുന്നു:

പഠന സംഗ്രഹം (Abstract)

അട്ടപ്പാടിയിലെ ഗോത്രവർഗ വിദ്യാർത്ഥികൾ നേരിടുന്ന സവിശേഷമായ സാമൂഹിക-സാംസ്കാരിക വെല്ലുവിളികളെ അഭിസംബോധന ചെയ്യുന്നതിനായി 'LSDG' ചട്ടക്കൂട് ഈ പഠനത്തിലൂടെ വികസിപ്പിച്ചു. പഠനത്തിന് മുമ്പുള്ള ഘട്ടത്തിൽ (2022) അടിസ്ഥാന സൗകര്യങ്ങളുടെ കുറവ്, ഭാഷാപരമായ തടസ്സങ്ങൾ, പരമ്പരാഗത അധ്യാപന രീതികൾ എന്നിവ വിദ്യാഭ്യാസ ഗുണനിലവാരത്തെ പ്രതികൂലമായി ബാധിച്ചിരുന്നതായി കണ്ടെത്തി. എന്നാൽ, LSDG ചട്ടക്കൂട് നടപ്പിലാക്കിയതോടെ (2022-2024), അധ്യാപകരുടെ വിദ്യാർത്ഥികളും തമ്മിലുള്ള ബന്ധം മെച്ചപ്പെടുകയും, പഠന നിലവാരത്തിലും അക്കാദമിക് നേട്ടങ്ങളിലും ജീവിത നൈപുണ്യങ്ങളിലും ഗണ്യമായ പുരോഗതി ഉണ്ടാവുകയും ചെയ്തു. ഡിജിറ്റൽ സാങ്കേതികവിദ്യയുടെ സംയോജനവും മാതൃഭാഷാധിഷ്ഠിത ബോധനരീതികളും ഈ മാറ്റത്തിൽ പ്രധാന പങ്ക് വഹിച്ചു.

മുഖ്യ പദങ്ങൾ (Key Words)

- സുസ്ഥിര വികസന ലക്ഷ്യങ്ങൾ (Sustainable Development Goals - SDGs)
- പ്രാദേശികവൽക്കരിച്ച SDG (Localized SDG - LSDG)
- ഗുണമേന്മയുള്ള വിദ്യാഭ്യാസം (Quality Education - SDG 4)
- ഗോത്രവർഗ സമൂഹങ്ങൾ (Tribal Communities)
- അട്ടപ്പാടി (Attappadi)
- ജീവിത നൈപുണ്യങ്ങൾ (Life Skills)
- അക്കാദമിക് നേട്ടം (Academic Achievement)

ഗവേഷണ രീതികൾ (Methods)

- ഈ പഠനം മിക്സ്ഡ് മെത്തേഡ് (Mixed Methods) സമീപനമാണ് പിന്തുടർന്നത്, അതായത് ക്വാണ്ടിറ്റേറ്റീവ് (Quantitative), ക്വാളിറ്റേറ്റീവ് (Qualitative) രീതികൾ ഒരുപോലെ ഉപയോഗിച്ചു.
- ക്വാണ്ടിറ്റേറ്റീവ് ഭാഗത്തിനായി സിംഗിൾ ഗ്രൂപ്പ് പ്രീ-ടെസ്റ്റ് - പോസ്റ്റ്-ടെസ്റ്റ് ഡിസൈൻ (Single-group pretest-posttest design) ഉപയോഗിച്ചു.

- വിവര വിശകലനത്തിനായി റിപ്പീറ്റഡ് മെഷേഴ്സ് ഓഫ് അനോവ (Repeated Measures ANOVA), ബോൺഫെറോണി പോസ്റ്റ് ഹോക് ടെസ്റ്റ് (Bonferroni Post Hoc Test), തീമാറ്റിക് അനാലിസിസ് (Thematic Analysis) തുടങ്ങിയ സങ്കേതങ്ങൾ ഉപയോഗിച്ചു.

ഗവേഷണ ഉപകരണങ്ങൾ (Tools)

ഗവേഷകൻ പ്രധാനമായും താഴെ പറയുന്ന ഉപകരണങ്ങൾ ഉപയോഗിച്ചു:

1. TARC: അധ്യാപകരുടെ കുട്ടികളും തമ്മിലുള്ള ബന്ധം അളക്കുന്നതിനുള്ള ഉപകരണം.
2. LQAT: കുട്ടികളുടെ പഠന നിലവാരം അളക്കുന്നതിനുള്ള ഉപകരണം.
3. LSAT: ജീവിത നൈപുണ്യ വിലയിരുത്തൽ പരീക്ഷ (പ്രശ്നപരിഹാര ശേഷി, വിമർശനാത്മക ചിന്ത, സർഗ്ഗാത്മക ചിന്ത എന്നിവ അളക്കാൻ).
4. LSDG Validation Tool Kit: വികസിപ്പിച്ചെടുത്ത ചട്ടക്കൂട് സാധൂകരിക്കുന്നതിന്.
5. അധ്യാപകർക്കും മറ്റ് പങ്കാളികൾക്കുമായുള്ള സെമി-സ്ട്രക്ചേർഡ് അഭിമുഖങ്ങൾ (Semi-structured Interviews).

പ്രധാന കണ്ടെത്തലുകൾ (Major Findings)

- അക്കാദമിക് നേട്ടം: ലോവർ പ്രൈമറി, അപ്പർ പ്രൈമറി, ഹൈസ്കൂൾ തലങ്ങളിലെ വിദ്യാർത്ഥികളുടെ മാർക്കുകളിലും ഗ്രേഡുകളിലും 2022 മുതൽ 2024 വരെയുള്ള കാലയളവിൽ വലിയ പുരോഗതി രേഖപ്പെടുത്തി.
- ജീവിത നൈപുണ്യങ്ങൾ: പ്രശ്നപരിഹാര ശേഷി, വിമർശനാത്മക ചിന്ത, സർഗ്ഗാത്മക ചിന്ത എന്നീ മൂന്ന് മേഖലകളിലും വിദ്യാർത്ഥികൾ മികച്ച പുരോഗതി കൈവരിച്ചു.
- അധ്യാപക-വിദ്യാർത്ഥി ബന്ധം: വെറും സഹതാപത്തിൽ അധിഷ്ഠിതമായ ബന്ധത്തിൽ നിന്നും ശാസ്ത്രീയമായ മെന്ററിംഗ് രീതികളിലേക്കും സാംസ്കാരികമായി ഉൾച്ചേരുന്ന ബോധന രീതികളിലേക്കും മാറ്റം സംഭവിച്ചു.
- Key words:
- ചട്ടക്കൂടിന്റെ സാധൂത: വിദഗ്ധ പരിശോധനയിലൂടെ LSDG ചട്ടക്കൂടിന് 0.91 എന്ന ഉയർന്ന സി.വി.ഐ (Content Validity Index) ലഭിച്ചു, ഇത് ഈ ചട്ടക്കൂടിന്റെ വിശ്വാസ്യത ഉറപ്പാക്കുന്നു.

സാമ്പിൾ (Samples)

- അട്ടപ്പാടിയിലെ ഗവൺമെന്റ്/എയ്ഡഡ് സ്കൂളുകളിൽ പഠിക്കുന്ന 1,259 ഗോത്രവർഗ വിദ്യാർത്ഥികൾ (ഇരുട്ട, മുഡുക, കുറുമ്പ വിഭാഗങ്ങളിൽപ്പെട്ടവർ) പഠനത്തിന്റെ ഭാഗമായി.
- സാമ്പിളിൽ 623 ആൺകുട്ടികളും 636 പെൺകുട്ടികളും ഉൾപ്പെടുന്നു.
- കൂടാതെ, അട്ടപ്പാടിയിലെ വിവിധ സ്കൂളുകളിലെ അധ്യാപകർ, പഞ്ചായത്ത് പ്രതിനിധികൾ, ഗോത്ര മൂപ്പന്മാർ തുടങ്ങിയവരിൽ നിന്നും വിവരങ്ങൾ ശേഖരിച്ചു.

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B	Life Skill Assessment Test – Draft (English Version)
C	Life Skill Assessment Test – Final (Malayalam Version)
D	Life Skill Assessment Test – Final (English Version).
E	Appendix as the scoring key
F	Life Skill Assessment Test – Draft (Malayalam Version)
G	Life Skill Assessment Test – Draft (English Version)
H	Learning Quality of Children – Final (Malayalam Version).
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J	Appendix as the scoring key
K	Life Skill Assessment Test – Draft (Malayalam Version)) and (Life Skill Assessment Test – Draft (English Version).
L	Life Skill Assessment Test – Final (Malayalam Version)
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P	Local Indicator Frame Work (LIF)- Draft
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ABBREVIATIONS

AI	: Artificial Intelligence
ANOVA	: Analysis of Variance
BRC	: Block Resource Centre
CVI	: Content Validity Index
ESG	: Environmental, Social and Governance
FGD	: Focus Group Discussion
ICT	: Information and Communication Technology
LP	: Lower Primary
LSDG	: Localized / Localised Sustainable Development Goals
LSG	: Local Self Government
MDG / MDGs	: Millennium Development Goal(s)
NEP 2020	: National Education Policy 2020
NEP 2020	: National Education Policy 2020
NPE	: National Policy on Education
PDI	: Panchayat Development Index
PTA	: Parent Teacher Association
QDA	: Qualitative Data Analysis
QQ Plot	: Quantile–Quantile Plot
RMSA	: Rashtriya Madhyamik Shiksha Abhiyan
RTE	: Right to Education
SDG 4	: Sustainable Development Goal 4 – Quality Education
SMC	: School Management Committee

SPSS (implicit in analysis section style — if it appears later, include)	:	Statistical Package for the Social Sciences
SSA	:	Sarva Shiksha Abhiyan
UNESCO	:	United Nations Educational, Scientific and Cultural Organization
UNICEF	:	United Nations Children's Fund
UP	:	Upper Primary
η^2 / η^2_p	:	Eta Square / Partial Eta Square

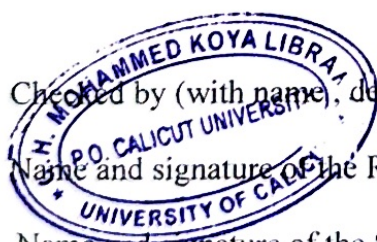


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CERTIFICATE ON PLAGIARISM CHECK

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SUKANYA K.U.

Name and signature of the Supervisor.

Prof. (Dr.) Seema Menon. K. P
Professor & Research Supervisor
Department of Education
NSS Training College Ottappalam
Research Centre in Education Kerala -879101

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INTRODUCTION

Need and Significance of the Problem

Statement of the Problem

Definition of the Key Terms

Variables of the Study

Objectives of the Study

Hypotheses of the Study

Methods of the Study

Limitations of the Study

Scope of the Study

Delimitations of the study

Organization of the Report

The study aims to provide a broader vignette for educational research related to the rural areas of Kerala specifically Attappadi. The research studies related to education through formal institutional structure have been discussed as a major concern through the ages. Education becomes a legitimate social force in propping up a standardised format which has become increasingly significant over the decade. Contemporary educational issues are complex and multidimensional, requiring research approaches that capture both measurable outcomes and the lived experiences of stakeholders. In this regard, a mixed-methods research design, integrating quantitative and qualitative approaches, offers a comprehensive framework for educational inquiry.

The impact of education on an individual is another discourse that is passed through as a construction of a state model which extends to the discussion of holistic development. The fact that the evolution of instructional technologies and learning strategies has displayed a lesser impact on children due to their exposure to multiple alternative influences. The educational conditions of learners in urban and semi-urban settings differ significantly from those of rural learners.

The factors like knowledge acquisition through various modes, skill development in an advanced level and the lifelong learning process of education is a question for the rural learners. Technological developments result in enduring effects on learners' educational experiences and outcomes. These ideas impact on the learners and the ability to develop the lifelong learning skills through social interaction is also an important development for them.

Historically, the notion of education had a clear relation with the then existing social environment. When Gandhi looked at education as a tool for an awareness of swadeshi which has a backdrop of freedom movement, Ambedkar's ideas were extremely different from that. He looked at it as a tool of empowerment which is more universal than Gandhi's ideas which adhered to a time bound movement. In an international perspective also, the idea of education is different for John Dewey and Maria Montessori.

Education is universally recognized as a foundational driver of human development, social mobility, and community empowerment (UNESCO, 2015). Global frameworks such as the Sustainable Development Goals (SDGs) emphasize that quality education is essential for reducing inequalities and enhancing lifelong learning opportunities (United Nations, 2016). SDG 4 specifically calls for inclusive, equitable, and high-quality education that enables all learners—especially those from marginalized populations—to develop foundational competencies, higher-order thinking abilities, and relevant life skills (UNESCO, 2017). In India, tribal communities continue to face systemic educational disadvantages shaped by socio-economic vulnerabilities, linguistic diversity, geographical isolation, and limited access to learning resources (Kumar & Jha, 2019). The educational challenges are particularly pronounced in Attappadi, a Scheduled Tribe-dominated region in Kerala, where students experience persistent gaps in learning outcomes, school engagement, and life-skill development (Nair & Joseph, 2021).

In recent years, the Localised Sustainable Development Goals (LSDGs) framework has attempted to contextualize SDG 4 principles to the lived realities of

Attappadi's tribal learners. Preliminary findings suggest improvements in teaching practices, classroom climate, learner engagement, and academic achievement after LSDGs implementation. However, a scholarly understanding of these transformations—particularly in relation to teacher–child relationships, learning quality, academic achievement, and life skills—remains limited. Therefore, this study aims to examine these core dimensions of quality education among Students from tribal communities in Attappadi within the SDG 4 framework.

The evolution of technology has profoundly impacted human relationships, societal structures, environmental interactions, and socioeconomic dynamics. Such transformations are instrumental in fostering the holistic development of future grassroots citizens, particularly with regard to their values, attitudes, and ethical orientation. Education is a tool that thrives and imparts value-based education, starting from early education. And these are leading us to development for the future. Needless to mention, development is essential for the fulfilment of human needs and improving the quality of human life. Such a development has to be longstanding, looking towards the future and sustainable. The Brundtland Report placed in the World Commission on Environment and Development mentioned that sustainable development is a principled development process on "meeting the needs of the present generation without compromising the fulfilment of the needs of future generations".

Education promotes sustainable development, using specific methods to change the world. Global learning for sustainable development is currently emerging from the increasing international concern with the issue of sustainable development and the demand for both global learning as well as education for sustainable

development. Education is a vital component of sustainable development, with Quality Education being one of its goals in itself. Thus, the concept of sustainable development inherently encompasses education.

Education serves as a fundamental component of the Sustainable Development Goals (SDGs), with SDG 4 focusing specifically on the provision of inclusive and equitable quality education. It highlights the importance of cultivating knowledge, skills, values, and attitudes that allow individuals to contribute effectively to sustainable development. Thus, education is essential for the realization of all facets of sustainability, and Education for Sustainable Development is crucial as it empowers learners to make informed choices and take responsible actions to maintain environmental health, promote economic stability, and advance social justice for both current and future generations.

The Government of India has been trying to make the country a full-fledged developed nation since independence. Still, there exist huge disparities. Many studies have been carried out and the findings have led to the making and implementation of various plans and policies for development, which is inclusive and sustainable.

Education plays a central role in advancing human development, social equity, and sustainable progress. Within the global development agenda, Sustainable Development Goal 4 (SDG 4) emphasizes inclusive and equitable quality education as a critical pathway for enhancing life skills and academic achievement. In the context of marginalized communities, particularly tribal populations in regions such as Attappadi, educational outcomes are shaped by complex socio-cultural, economic, and institutional factors.

While global frameworks provide broad direction, their effectiveness depends significantly on contextual adaptation at the local level. The localisation of Sustainable Development Goals (LSDGs) represents an emerging approach to aligning global targets with local realities through participatory planning, context-sensitive indicators, and decentralized governance mechanisms. However, empirical evidence on how such localisation influences educational quality, life skills, and academic achievement among tribal learners remains limited.

Hence the study addresses this gap by examining the impact of LSDG implementation on key dimensions of educational development among tribal students in Attappadi.

India enacted ‘The Right of Children to Free and Compulsory Education Act’ or ‘Right to Education Act, an Act of the Parliament of India upholding the importance of free and compulsory education for children between 6 and 14 in India under Article 21A of the Indian Constitution. The new National Education Policy and Sustainable Development Goal 4 share the goals of universal quality education and lifelong learning, Higher Education, and Teacher Training. Hence, an integrated approach is crucial for progress across multiple goals.

The history of mainstream educational policies and systems were clear and were documented through various resources. But the parallel social set and its educational history was never assessed or investigated. Even the formal education was inaccessible to those. Rurality and structural inequalities linked to caste, class and gender denied opportunities to a significant number of people to achieve upward social mobility.

In this background, to revitalize educational development, a comprehensive approach/strategy needs to be developed which envisages SDGs as the beginning to transform the process of development at the local level. Many of these SDGs directly and indirectly are contributing to the quality of education. Achieving the objectives of SDGs can and should be built based on existing experience in goal setting, monitoring and implementation. Robust follow-up and review mechanism for the implementation of the 2030 Agenda for SDGs requires a solid framework of indicators and statistical data. The goals at local governmental level taken through themes, targets and indicators are aspirational in nature, relevant and placing the global goals that are universally applicable, in line with national policies and priorities as well as considering local realities in a concise and easy to communicate manner. All these are expected to contribute to higher achievements in education.

Integrating Indian epistemic traditions i.e. including tribal ecological knowledge and community- based resource management could create more synergistic and culturally relevant pathways to achieving the SDGs. Indigenous knowledge systems in India, from sustainable agriculture to water conservation practices, naturally align with several SDGs targets but require institutional support to maximize their impact. Priya (2025) in her paper “Sustainable development goals (SDGs) and Indian epistemic traditions: A synergistic approach to global sustainability” advocates for a synergistic approach that respects indigenous cosmologies, values, and local systems of knowledge.

Educational institutions serve as key spaces for introducing learners to the legal, ethical, and cultural dimensions of knowledge ownership and innovation.

Similarly, education on tribal knowledge systems encourages ethical use, documentation, and preservation of indigenous practices, while addressing issues of biopiracy and cultural appropriation. These were the challenges faced related to informal community-based education.

From the literature review it is evident that when each is open to the vision of being “holistic”, there are substantively more commonalities than differences. But, given their core focus, these frameworks need to be encouraged to continue their challenging and fruitful work of building a peaceful world through education, while building collaborative bridges for “theory and practice”. This was reflected, for example, in the recent UNESCO-Bangkok organized Experts Meeting on “Reorienting Education to Address Sustainability”,

Quality education is one of 17 Global Goals that make up the 2030 agenda for Sustainable Development Goals. The Sustainable Development targets for 2030 call for ensuring the completion of primary and secondary education by all boys and girls, and guaranteeing equal access to opportunities for access to quality technical and vocational education for everyone and to eliminate gender and wealth disparities with the aim of achieving universal access to a quality higher education. Achieving inclusive and quality education for all reaffirms the belief that education is one of the most powerful and proven vehicles for sustainable development. Policy interventions will require improving access and improving quality, as well addressing relevant obstacles which include gender inequalities, food insecurity, health, poverty etc. Education remains central to achieving the SDGs and empowering tribal communities. (Mangalagiri, 2025).

Quality education has been increasingly conceptualised as a multidimensional process involving equitable access, effective teaching, relevant learning experiences, active student participation, and holistic skill development (Pollard & Filer, 2018). For tribal learners, whose cultural, linguistic, and socio-economic contexts differ significantly from mainstream populations, achieving these dimensions requires culturally responsive, learner-centred educational approaches (Banks, 2016). In regions like Attappadi, the intersection of poverty, malnutrition, linguistic barriers, and limited parental literacy contributes to educational exclusion (George & Mathew, 2020). Despite various governmental interventions, Students from tribal communities have historically shown low achievement in foundational literacy and numeracy, high absenteeism, and limited progression to higher levels of education (Rajan & Menon, 2017).

Teacher–child relationships are known to significantly influence learners’ emotional security, classroom participation, and academic engagement (Pianta, 1999). Similarly, learning quality—including pedagogy, assessment, and classroom resources—shapes students’ ability to understand, think critically, and construct knowledge (Darling-Hammond et al., 2020). Life skills such as problem-solving, critical thinking, and creativity are essential for preparing learners for a rapidly changing world (WHO, 2015). Yet, research on how these components function within tribal schooling systems in Kerala, particularly under SDGs localisation, remains scarce.

Education Development through Policies and Legislations

In the context of Kerala, the Kerala Education Bill of 1957 was a significant milestone in the state's educational progress. It advocated for decentralized governance in schools and encouraged local initiatives in education. Section 18 of the Bill focused on the establishment of Local Educational Authorities. The National Policy on Education (NPE) of 1986 also emphasized grassroots-level actions, including microplanning.

Following various attempts in education policies and legislation, the Right to Education (RTE) Act was introduced on August 4, 2009. This Act established education as a fundamental right for children aged 6 to 14 years and assigned the responsibility for providing this to both state and central governments. It mandates that education be free and compulsory, directing authorities to offer it in neighbourhood schools to improve access for children.

Minimum standards for elementary schools are stipulated, covering aspects such as infrastructure, teacher qualifications, and curriculum. Another groundbreaking aspect of the Act is that private schools are required to reserve 25% of their seats for children from disadvantaged backgrounds and economically weaker sections. The Act also prohibits practices like capitation fees, admission screening procedures, and the operation of unrecognized schools. Since education must be guaranteed for children up to the age of 14, there are provisions for offering special training to school dropouts.

The primary goals of the Act were to guarantee universal access to education, promote social inclusion, and ensure quality education. It aims to provide all children, irrespective of their backgrounds, with access to quality elementary education. The 25% reservation in private schools was designed to enhance social inclusion and close the gap between different societal segments. Establishing minimum standards for schools was intended to ensure that children receive a quality education. When we later consider the Sustainable Development Goals (SDGs), particularly the Goal on Quality Education and its accompanying indicators, the RTE Act has played a leading role in this area. Nonetheless, there are significant challenges and shortcomings in its actual implementation, with many regions falling behind. This is where the Localisation of SDGs and its framework can assist in monitoring the achievement of the SDGs.

Additionally, the 73rd amendment to the Constitution and its 11th Schedule propose transferring the responsibility for “Education including primary and secondary schools” to the Panchayati Raj institutions. As a result, the Kerala Panchayat Raj Act (as amended in 1999) has placed Government Pre-primary and Primary schools and their staff under the Gram Panchayats, while high schools and higher secondary schools fall under the District Panchayats. The People’s Plan Campaign, aimed at participatory planning with the allocation of funds to local governments, has created opportunities for enhancing schools, leading to improved quality education, especially through local governments facilitating various resources and infrastructure such as classrooms, offices, compound walls, water supply, toilets, playgrounds, laboratories, libraries, IT infrastructure, and furniture.

Later, under the guidance of the Ministry of Panchayati Raj, outcome-based planning was implemented using the SDGs Local Indicator Framework, particularly through the Panchayat Development Index, which eventually evolved into the Panchayat Advancement Index. The localised SDGs initiative themed around Child Friendly Villages includes quality education with relevant targets and indicators. This has equipped stakeholders with the necessary tools to evaluate, monitor, and assess progress, especially regarding quality education. In Kerala, this has been aligned with the initiative known as Nava Kerala Karama Paripaadi (New Kerala Action Programme), one of the missions under which is the Pothu Vidyabhyaasa Samrakshana Yajnam (Public Education Rejuvenation Mission).

The New Education Policy is a comprehensive plan for action. It includes all those aspects that will lead to complete inclusion of the children with disabilities in the education system. There are 5 major aspects to give a structure to all the points included in NEP 2020. They are Positive Attitude, Flexible Curriculum, School Preparedness, Individualized programme, Resources and support. “Regular schools with this inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all; moreover, they provide an effective education to the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system.” (Salamanca Statement, Spain 1994). The Salamanca Statement clearly addresses this through the Framework of Action on Special Needs Education. Biwako Millennium Framework for Action too emphasizes an inclusive, barrier-free and rights-based society for persons with disabilities in Asia

and the Pacific. This incorporates relevant targets of the Millennium Development Goals that are related to persons with disabilities (Balasundaram, 2005).

Need and Significance of the Problem

There have been many efforts in the past few years in improving the quality of education, especially of the marginalized sections of the society. This has led to the upgrading of infrastructural facilities in schools including those based on latest technologies. Information technology is being used widely in schools so as to improve the quality of education. SMART classrooms have been instituted across Kerala. All Teachers training has contributed to the upgradation of knowledge and skills of teachers in this digital era. All these are expected to improve the quality of education and educational performance of students.

Considering that all these interventions are spread across the entire state, the effects of it will also be reflected in tribal areas and also the tribal student's academic achievements. However, not many studies have been conducted so far on measuring the impact of these interventions among the tribal secondary and higher secondary school students in the recent past.

There is a critical need to examine the quality of education among students from tribal communities in Attappadi because educational disparities continue to limit their academic growth and life opportunities (Kumar & Singh, 2018). Tribal learners often face unique socio-cultural and economic barriers that impede consistent school attendance and participation, necessitating deeper investigation into their specific educational experiences (Rao & Devika, 2020). SDG 4 emphasises equity, inclusion,

and effective learning outcomes, making it essential to explore how these principles are implemented in marginalised tribal regions (UNESCO, 2016). Teacher–child relationships significantly shape student motivation, emotional well-being, and classroom engagement, particularly for first-generation learners who require additional pedagogical and socio-emotional support (Pianta & Hamre, 2006). In Attappadi, where linguistic transitions and low confidence affect student participation, understanding the role of teacher–child relationships become especially important for improving learning outcomes (Nair & Matthew, 2019).

On the other hand, it has to be noted that mere interventions at the school level alone will not address the issues of academic achievement of students, especially those of the marginalized sections of the society like that of the students from tribal communities. There is literature available which has corroborated this where socio-economic status contributes to academic achievement.

Since 2016, Sustainable Development Goals have been the global tool which is considered to be the planning and measuring tool for all development interventions. With 17 goals and 306 indicators leading to targets, they have been considered as tools which help in planning, implementation, monitoring and measuring the status of development in all sectors, including education. This also has provided scope for identifying interlinkages of various goals and sectors. This helps in identifying those sectors and goals which too contribute to the development in the sphere of education. However, there are no specific studies conducted so far on the relation between the attainment of various SDGs at various levels like national, state and local level and the educational performance.

While development interventions are increasingly designed in alignment with the Sustainable Development Goals (SDGs) and their associated indicators, a coherent framework to systematically examine the contribution of various SDGs to educational performance remains largely underdeveloped. This absence constitutes a significant lacuna in educational planning, particularly in efforts aimed at enhancing the quality of education and improving academic achievement. The need for such a framework becomes especially critical in the context of marginalized communities, such as tribal populations, where sustained improvement in academic outcomes is essential to facilitate meaningful social mobility and integration into the mainstream. Addressing these disparities must be consistent with the core principle of the SDGs Agenda 2030, which emphasizes that development processes should ensure no one is left behind.

Furthermore, the quality of learning environments—including pedagogy, resources, and assessment systems—directly influences students' comprehension and academic performance, highlighting the need for systematic evaluation in tribal contexts (Darling-Hammond et al., 2020). Existing literature indicates that Students from tribal communities often experience rote learning, limited classroom activities, and poor access to ICT, underscoring the urgency of assessing learning quality in Attappadi (Verma & Pradhan, 2017). Academic achievement among tribal learners remains an area of concern, as gaps in foundational literacy and numeracy persist despite various educational initiatives (Sharma & Kumar, 2021). A detailed assessment of achievement trends is therefore required to inform targeted interventions aligned with SDG 4 goals (UNICEF, 2018).

Life skills such as problem-solving, critical thinking, and creative thinking are essential for enabling learners to adapt to complex social and academic challenges,

and their development must be examined within tribal schooling systems (WHO, 2015). Research suggests that insufficient life-skill development can negatively impact long-term educational progress and future employability, emphasising the need for focused study in this area (Mitra & Choudhury, 2019). Considering these multidimensional challenges and the recent introduction of the LSDGs framework in Attappadi, a comprehensive study is needed to understand educational transformations and identify persisting gaps (Joseph, 2022). Such research is essential for designing context-responsive strategies that address the systemic inequities experienced by tribal learners (Sen & Patel, 2020).

Research conducted by (Priya, 2025) and (Yerramilli, 2025) highlight how Indian epistemic traditions, which are based on harmony, coexistence, and respect for the natural world, may support global sustainability initiatives. Kerala's tribal regions, particularly Attappadi and Wayanad, offer powerful illustrations of this relevance demonstrate how tribal women in Attappadi have leveraged both traditional roles and modern interventions to improve health and education outcomes, directly contributing to SDGs 3, 4, and 5. Similarly, show that sustainable livelihood practices in Wayanad, including indigenous agroecological methods, reflect a convergence between traditional knowledge and the targets of SDGs 1 (No Poverty) and SDGs 15 (Life on Land).Despite existing challenges, there have been appreciable advances in the education sector in recent times. Culturally fixed teaching, which incorporates local languages, narratives, and worldviews, enhances educational outcomes and meets SDG 4 while maintaining cultural identity (Mangalagiri, 2025). This implies that development initiatives have a higher chance of success when they are in line

with tribal worldviews. Considering the factors mentioned above, there is an urgent need to identify linkages of SDGs with educational competencies and life skills of students from tribal communities. The use of the mother tongue as the medium of instruction has gained increasing recognition as a critical factor in improving learning outcomes. Research indicates that children learn more effectively and develop cognitive and linguistic skills better when taught in their native language, especially in the early years of education.

Attappadi is one of the areas in Kerala which has comparatively higher tribal population and a study based on their issues and progress can be made applicable to the entire State. Quality education is one of the sustainable development goals and many other SDGs have direct and indirect linkage with regard to the achievement of the Goal 4 – Quality Education. Moreover, the SDGs based conceptual framework on which this study is being proposed is comparatively a novel one so that it would be useful for the academia, policy planners and local governments while planning for improving the quality of education among the students from tribal communities. This will also help them in identifying those indicators and goals in SDGs which are important in improving their academic achievement and life skills. Here comes the importance of this study. Hence the present study is entitled as “**DEVELOPMENT AND VALIDATION OF A LOCALISED SUSTAINABLE DEVELOPMENT GOALS FRAMEWORK FOR QUALITY EDUCATION AND EVALUATING ITS EFFECT ON STUDENTS FROM TRIBAL COMMUNITIES IN ATTAPPADI**”.

Statement of the Problem

The investigator seeks to develop and validate a Localized Sustainable Development Goals (LSDGs) framework for enhancing quality education and to evaluate its impact on Students from tribal communities in Attappadi. Accordingly, the study is titled “Development and Validation of a Localized Sustainable Development Goals Framework for Quality Education and Evaluation of Its Impact on Students from tribal communities in Attappadi.” This study in general aims to examine the effectiveness of a development goals framework in enhancing the quality of education among tribal communities in India. Specifically, it seeks to analyse how Sustainable Development Goals (SDGs), educational indicators, and policy interventions can be aligned to improve learning outcomes, academic achievement, and socio-educational inclusion of tribal learners, thereby promoting equitable access to quality education.

Definition of the Key Terms

Impact

Cambridge Dictionary says that impact is a powerful effect that something, especially something new, has on a situation or person.

In this study impact means, to have a direct effect.

Sustainable Development Goals

“The concept of “sustainable development” was first introduced by Brundtland (1987), who defines development as “sustainable” if it “meets the needs

of the present without compromising the ability of future generations to meet their own needs”.

The Sustainable Development Goals (SDGs) consist of 17 interrelated global objectives that were adopted by all United Nations Member States in 2015 as part of the 2030 Agenda for Sustainable Development. They serve as a common framework for promoting peace and prosperity for both individuals and the planet, in the present and for future generations. The SDGs tackle a wide array of global issues—including poverty, inequality, health, education, climate change, environmental degradation, peace, and justice—with the goal of creating a more sustainable, inclusive, and equitable world by the year 2030.

Localizing Sustainable Development Goals

Localized Sustainable Development Goals (LSDGs) refer to the process of adapting and translating the global 2030 Agenda for Sustainable Development into local contexts by developing and implementing local strategies and actions that address specific regional needs and priorities, while maintaining coherence with national frameworks. This approach emphasizes participatory planning involving local communities, multi-level governance, subsidiarity, inclusion, and dedicated local data and financing mechanisms to ensure effective achievement of the SDGs at the subnational level (United Nations, 2008; European Commission, 2024).

In the current investigation, Localization is described as the process of defining, implementing and monitoring strategies at the local level for achieving global, national, and sub-national sustainable development goals and targets. In the case of

Panchayats, localisation has been done through Local Indicator Framework and thematic SDGs based planning and implementation. It has gone steps further by developing the Panchayat Development Index under this framework, which later has been restructured as Panchayat Advancement Index.

Teachers Relationship with Children

Teacher–student relationships encompass the interactive and relational bond between teachers and students, marked by trust, respect, emotional connection, and open communication in educational settings. It involves supportive interactions that enhance students' motivation, engagement, emotional well-being, and academic success (Jowett et al., 2023; Wang et al., 2025). This relationship is built on commitment—dedicating time and effort from both teacher and student—as well as closeness (trust and rapport), complementarity (alignment of teaching and learning styles), and shared expectancy for academic achievement (Jowett et al., 2023).

Within this research context, the teacher–child relationship is conceptualized in terms of its quality as perceived and reported by the teachers themselves. This quality is evaluated using a specifically designed assessment instrument, which captures teachers' perceptions and experiences regarding their interactions and relational dynamics with the children.

In other words, the quality of the teacher–child relationship is measured using teachers' own perceptions of their interactions and affective bonds with students, as captured by a context-specific standardized assessment tool.

Learning Quality of Children

Learning quality of children is defined as the extent to which education provides a holistic, inclusive, and supportive environment that fosters the social, emotional, mental, physical, and cognitive development of each child. It encompasses safe and healthy environments, active and effective teaching, child-centred learning processes, relevant and engaging content, and supportive engagement from parents, caregivers, and communities to ensure children are prepared for lifelong learning and active participation in society (Save the Children, 2021; Wellspring Foundation, 2022; PAL Network, 2024).

In this work, the learning quality of children is defined as the overall ability and performance of students as perceived by their teachers. This perception is captured through the responses provided by teachers on a standardized assessment tool specifically developed for this purpose. The scores and feedback given by the teachers using this instrument represent the learning quality of the children, reflecting their cognitive, social, and academic competencies as observed in the classroom setting. This operational definition emphasizes relying on teachers' judgments expressed via the structured assessment tool to quantify the learning quality of children in the study context.

Academic Achievement

Academic achievement is defined as the extent to which a student attains their short-term or long-term educational goals, reflecting the knowledge or skills developed through schooling and measured by examinations, assessments, or teacher

evaluations. It encompasses performance in academic subjects and the demonstration of competencies aligned with instructional standards within an academic period (Hornby, 2006; Good, 1959; Study.com, 2016).

Academic achievement is the extent to which a student successfully attains the specified learning objectives set by the educational program. It is operationally measured by the scores obtained by the student on achievement tests or assessments conducted by the school, such as standardized tests, final exams, or cumulative grades. These scores serve as a quantitative indicator of the student's ability to meet educational goals within a given time frame. This definition aligns with common academic research where academic achievement captures a student's performance ability as reflected through grades or test scores, representing the accomplishment of learning goals and acquisition of knowledge and skills.

The term academic achievement denotes the scholastic competencies attained by a student in the current study.

Life Skills

Life skills are defined by the World Health Organization (WHO) as "abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life" (World Health Organization, 1994, p. 1).

For the purposes of this study, life skill development is limited to the competencies of critical thinking, problem-solving, and creative thinking. Life skill development is operationally defined as the score achieved by students on a purpose-designed assessment instrument, which evaluates their proficiency in the three

selected skills and reflects their capacity to apply these skills effectively across diverse contexts.

This means that the development of life skills is quantitatively measured by the performance of students on a standardized test that evaluates critical thinking, problem-solving, and creative thinking abilities.

Students from tribal communities

For the purposes of the present study, the term ‘tribes’ refers to all students from Standards I to X in the Attappadi region of Palakkad District, Kerala. This area is predominantly inhabited by tribal communities, including the Kurumba, Muduga, and Irula groups, who represent the primary focus population for examining educational experiences and outcomes within this study context.

Attappadi

Attappadi, a Block Panchayat area that includes three Gram panchayats in North-East Palakkad adjacent to Silent Valley National Park, is primarily populated by the tribal communities of Kurumba, Muduga, and Irula. The unique blend of tribal existence, ecological vulnerability, and developmental issues makes Attappadi a point of interest for many scholars. Over the decades, Attappadi has undergone significant changes due to various factors, including settler migration, land dispossession, deforestation, and emerging market dynamics. These changes have negatively impacted tribal autonomy, self-sufficiency, and cultural heritage. Established in 1962, Attappadi was one of the pioneering tribal development blocks in the nation. Nevertheless, it has consistently received low rankings on human development

metrics, grappling with severe poverty, elevated infant mortality rates, widespread malnutrition, low literacy, and inadequate infrastructure. While Kerala is known for its high literacy and public health standards, Attappadi has lagged behind, particularly concerning its tribal communities' education and health. In recent years, Attappadi has been undergoing transformation, especially due to focused initiatives by local Panchayats and various governmental interventions. It is here that SDGs based planning at the local level is important.

Variables of the Study

For the present study the following variables are in view:

Independent variable

- LSDGs-based intervention

Dependent variables

- Teachers' relationship with children
- Learning quality of children
- Academic achievement
- Life skills

Objectives of the Study

Qualitative Objectives

1. To examine the status of quality education among students from tribal communities in Attappadi in relation to Sustainable Development Goal 4

(Quality Education) prior to the implementation of the Localized Sustainable Development Goals (LSDGs) framework.

2. To design and develop a localised Sustainable Development Goals (LSDGs) framework tailored to the socio-cultural and educational context of Attappadi.
3. To validate the developed LSDGs framework through expert evaluation, pilot testing, and stakeholder feedback.
4. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Teachers' Relationship with Children
Before the implementation of LSDGs
5. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Teachers' Relationship with Children
after the implementation of LSDGs
6. To compare the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Teachers' Relationship with Children
Before and after the implementation of LSDGs
7. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Learning Quality of Children
Before the implementation of LSDGs
8. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to

- Learning Quality of Children
After the implementation of LSDGs
- 9. To compare the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Learning Quality of Children
Before and after the implementation of LSDGs
- 10. To compare the status of quality education among lower primary students from tribal communities based on SDGs framework with respect to
 - Their Achievement
Before, during, and after the implementation of LSDGs
- 11. To compare the status of quality education among upper primary students from tribal communities based on SDGs framework with respect to
 - Their Achievement
Before, during, and after the implementation of LSDGs
- 12. To compare the status of quality education among high school students from tribal communities based on SDGs framework with respect to
 - Their Achievement
Before, during, and after the implementation of LSDGs
- 13. To assess the status of quality education among lower primary students from tribal communities based on SDGs framework with respect to
 - Life skills
Before, during, and after the implementation of LSDGs
- 14. To assess the status of quality education among upper primary students from tribal communities based on SDGs framework with respect to

- Life skills
Before, during, and after the implementation of LSDGs
- 15. To compare the status of quality education among high school students from tribal communities based on SDGs framework with respect to
 - Life skills
Before, during, and after the implementation of LSDGs
- 16. To examine the current status of quality education among students from tribal communities in the context of Sustainable Development Goal 4 (SDGs– Quality Education) after the implementation LSDGs

Hypotheses

1. No statistically significant difference was observed in the mean score of achievement of lower primary students from tribal communities in Attappadi based on the SDGs framework, before, during, and after the implementation of LSDGs
2. There exists no significant difference in the mean score of achievement of upper primary students from tribal communities in Attappadi based on the SDGs framework, before, during, and after the implementation of LSDGs
3. No notable difference emerged in the mean score of achievement of high school students from tribal communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs
4. No substantial difference was identified in the mean score of life skills of lower primary students from tribal communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs

5. No considerable variation was detected in the mean score of life skills of upper primary students from tribal communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs
6. There exists no significant difference in the mean score of life skills of high school students from tribal communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs

Methodology of the Study

Method adopted

The present study adopted an explanatory sequential mixed method design

Population of the study

Students from tribal communities enrolled in primary, upper primary, and secondary schools in Attappadi form the population for this study.

Sample of the study

The sample for the study comprised 1,259 students from tribal communities, drawn from lower primary, upper primary, and secondary schools in Attappadi.

Tools and Techniques Used for the Present Study

The investigator, for the purpose of proceeding the study, used the following tools:

- A tool for assessing The Teachers Relationship with Children
- A tool for assessing the Learning Quality of Children
- SDGs Local Indicator Framework prepared and standardized by the researcher and the guide.

- LSDGs Validation Tool Kit
- Life Skill Assessment Test prepared and standardized by the researcher with the guidance of the research guide
- Document Analysis Schedule
- Semi structured Interview for the Teachers and other stakeholders
- Validation Checklist for the Localised Sustainable Development Goals (LSDGs) Framework – Attappadi
- The score obtained by the learners in the annual exam were used as the score for achievement in this study

Statistical Techniques Used for the Study

The following statistical techniques will be used for the analysis of the data:

- Preliminary statistics like mean, median, mode, standard deviation, skewness and kurtosis for testing the normality of the collected data
- Independent sample t-Test,
- Repeated measures of ANOVA
- Test of Sphericity (Mauchly's W)
- Greenhouse–Geisser Correction
- Huynh–Feldt Correction
- QQ Plot
- Normality Test
- Repeated Measures ANOVA
- Bonferroni Post Hoc Test
- Adjusted Post-Test Scores

- Eta Square (η^2)
- Eta Square p
- Partial Eta Square (η^2p)
- Greenhouse–Gas H -Test
- Taguette QDA: Taguette is an open-source qualitative data analysis tool for coding text, organizing themes, and exporting coded segments.
- Word Cloud Analysis: A word cloud displays the most frequent words in a dataset using font size to show frequency.
- Thematic Network: A thematic network shows relationships between basic themes, organizing themes, and global themes.
- Frequency Bar Chart: A bar chart showing how often names, terms, or codes appear in the data.
- Thematic Intensity Heatmap: A heatmap that shows the density or intensity of themes across participants, groups, or text segments using color gradients.
- Code–Theme–Excerpt

Limitation of the Study

- The access to data before 2015 was limited
- A continuous observation of the life skills of the same students was not practicable.
- The study focuses exclusively on tribal schools in Attappadi and includes teachers and students within the identified LSDGs intervention period. The findings are limited to the selected sample and qualitative data sources used in the research.

- Critical methodological limitations:
 - a. Lack of control/comparison group
 - b. Single-group pretest–post-test is weak for attributing causality
 - c. Threats:
 - d. Maturation (natural improvement over years)
 - e. History effects (other govt programmes)
 - f. Testing effects
 - g. Teacher changes, curriculum changes

Delimitation of the study

- Quality education under SDG 4.1.1 was examined through four dimensions: foundational learning, chronic absenteeism, academic achievement, and life skills.
- The module focused exclusively on three life-skill components: problem solving, critical thinking, and creative thinking.
- Academic achievement was measured using researcher-developed tests aligned with curriculum-based learning outcomes.
- The study was limited to students from tribal community in selected government and government-aided schools in Attappadi, Kerala.
- The intervention used a localized SDG module tailored specifically to the socio-cultural context of Attappadi.

- Data were collected only for the academic years 2022, 2023, and 2024.

Scope of the Study

The proposed study will throw light on the life skills and academic achievement of the students from tribal communities of Attappadi. The research will look at the various components which measure life skills and academic achievement. These will be analysed based on the development status of the area. This development status is measured with the indicators and targets of the SDGs framework, with global and national perspectives. The analysis of SDGs based on data will be helpful to get knowledge and understanding of the social and economic conditions of the tribal people. The review helps to understand the policies implemented by different administrative authorities for the upliftment of the tribes which would contribute to the life skills and academic achievement of Students from tribal communities, especially the local governments. This will also give an idea of the areas which need further research.

The present study is delimited to the development, validation, and evaluation of the educational impact of a Localized Sustainable Development Goals (LSDGs) Framework designed to enhance quality education among Students from tribal communities in Attappadi. The study is restricted to government and government-aided schools within the Attappadi block, which primarily serve children from the Irula, Muduga, and Kurumba tribal communities. The investigation focuses on four core dimensions of educational quality

- (a) teacher–child relationships,
- (b) learning quality,
- (c) academic achievement, and
- (d) life skills, including problem-solving, critical thinking, and creative thinking.

The scope encompasses a systematic assessment of these variables across three phases of intervention: the pre-LSDGs phase (2022), which establishes the baseline status; the mid-implementation phase (2023), which captures transitional progress; and the post-LSDGs phase (2024), which evaluates the effectiveness of the framework. Participants are limited to teachers and students from lower primary, upper primary, and high school levels within the selected tribal schools.

The study combines qualitative thematic analysis and quantitative inferential statistics, drawing upon structured tools, narrative responses, classroom observations, and comparative evaluations. The LSDGs framework developed for this research is culturally grounded and context-specific; thus, its applicability is limited to tribal educational environments with similar socio-cultural characteristics. The study does not include private schools, non-tribal populations, early childhood education centres (Anganwadis), or higher education institutions. Likewise, policy recommendations derived from the findings pertain specifically to the educational ecosystem of Attappadi and are not intended for direct generalisation to other tribal regions without appropriate contextual adaptation.

Additionally, the scope includes evaluating the current capabilities in goal-setting, monitoring, and implementation to aid in achieving the SDGs at the local

level. Acknowledging that the majority of SDGs targets and indicators need to be fulfilled at the local level due to decentralized responsibilities, the research investigates the ongoing process that connects global and national indicators with local situations.

Particular attention is given to SDG 4, which seeks to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Education is recognized as a fundamental aspect of development in India, with the New Education Policy offering a thorough plan for incorporating all learners, including those with disabilities, into mainstream education. The research indicates that without universal access to quality education, national development goals cannot be fulfilled.

By aligning local needs with national policies while taking local contexts into account, this research provides a framework for LSGs to effectively play a role in achieving the 2030 Agenda. It encompasses the principles of inclusivity, equity, and sustainability, making education and other devolved areas essential for achieving long-term development goals.

Ethics Approval Statement

This study adhered to standard ethical guidelines for educational research. Informed consent was obtained, confidentiality was maintained, and participants' rights and cultural sensitivity were respected throughout the study. Sanction letter is attached in Appendix Q

Organization of the Report

The report is presented in six chapters – Introduction, Review of Related Literature, Methodology, Analysis and Discussion, Findings, Limitation and Conclusion, Recommendations and Suggestions.

Chapter 1 Introduction gives a brief introduction to this study. The chapter discusses the need and significance of the study at this age, presents the Objectives and hypothesis as well as the methodology adopted for this study.

Chapter 2 goes through the previous studies carried out with respect to the selected variables of the study. This chapter also discusses in brief the theories behind the selected variable. As SDGs is considered as one of the new areas of research, more focus is on the detailed explanation of SDGs and its localization. The researcher focused more on the studies conducted by taking Students from tribal communities as samples.

Chapter 3 discusses in detail the procedure of the study followed by the researcher. The steps followed by the researcher for making the tools required to collect the necessary data required for this study is presented in detail in the third chapter, Methodology.

The results obtained through the detailed analysis of the data is presented in Chapter 4. The obtained results are discussed in a clear manner and are depicted in this chapter.

Chapter 5 gives a findings, limitations and conclusion of the study.

Chapter 6 gives a Recommendations and suggestions of the study. The researcher also presents a few suggestions which can be taken in the future for further studies. The researcher also presents generalisations of the study which can be taken in the future applications of the study.

REVIEW OF RELATED LITERATURE

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- *Theoretical Overview of the study*
 - *Studies Related to Sustainable Development Goals*
 - *Studies Related to Life skills*
 - *Studies Related to Academic achievement*
 - *Studies Related to Teachers Relationship with children*
 - *Studies Related to Learning Quality of children*
 - *Summary of the studies*
 - *Research gap and conclusions*
-

In this chapter, the researcher provides a summary of pertinent studies related to the issue being explored, **“DEVELOPMENT AND VALIDATION OF A LOCALISED SUSTAINABLE DEVELOPMENT GOALS FRAMEWORK FOR QUALITY EDUCATION AND EVALUATING ITS EFFECT ON STUDENTS FROM TRIBAL COMMUNITIES IN ATTAPPADI.”** This literature review investigates earlier research in the area to understand how the localization of SDGs affects educational outcomes and the development of life skills among Students from Tribal Communities. It has also played a crucial role in pinpointing the research gap, refining the study's title, choosing an appropriate methodology, and identifying suitable statistical methods for data analysis.

Review involves the systematic identification, location and analysis of documents as well as information related to the research problem in hand. Past researchers always act as a torch bearer to the present and future researches. The researcher has gone through several books, articles, research reports, government and nongovernmental documents for the purpose of studying more about the selected area for the study. The chapter provides a theoretical overview using review of related literature.

The literature that has been gathered and analysed has been systematically categorized and displayed according to particular themes to enhance clarity and facilitate understanding. To aid comprehension, the summary of research is organized into these categories:

- Studies Related to Sustainable Development Goals
- Studies Related to Localisation of Sustainable Development Goals

- Studies Related to Teachers Relationship with Children
- Studies Related to Learning Quality of Children
- Studies Related to Life skills
- Studies Related to Academic Achievement
- Summary of the studies
- Research gap and conclusions

Theoretical Overview of the Study

This section gives the theories and ideas behind the selected variables: Sustainable Development Goals, Life skills and academic achievement. A brief description of Attappadi is also given in this chapter. As this research is entirely based on Sustainable Development Goals, it is discussed in detail hereafter.

Sustainable Development Goals (SDGs)

The present investigation focuses on the Sustainable Development Goals (SDGs) and examines the process of their localisation in the tribal region of Attappadi, with particular emphasis on the education goal (SDG 4). Localisation, in this context, refers to adapting and implementing the global education targets within the unique socio-cultural, economic, and environmental settings of the community. In Attappadi, this involves aligning educational initiatives with the specific needs, priorities, and resources of the tribal population to ensure culturally appropriate and contextually relevant learning opportunities. The study explores how this localised approach impacts life skills development and academic achievement, contributing to inclusive and sustainable educational progress in the region.

There are numerous definitions and conversations surrounding the concept of development. From the 1940s through the 1960s, economic growth was seen as the main driver of global progress. Even the term "economic growth" has been interpreted differently by various schools of thought. Development and economic growth are not the same. The term "development" gained prominence in the 1970s. What, where, and with who constitutes this development was the topic of discussion. It continued by going over the elements of development, elements which lead to growth and development and the variables that influence development. The idea of human development resulted from this.

Amartya Sen was one of the many economists who had done a great deal of research on human development. Under the direction of Mahbub ul Haq, the UNDP released a report in 1990 (UNDP Human Development Report (annual publication) Oxford University Press) which defined development as a process of expanding people's options. The point is that human development involves a variety of choices, including those related to society, politics, and the economy, while economic growth merely includes income as the sole option. This conversation carried on with Amartya Sen's emphasis on "development as freedom." (Amartya Sen (1999), "The ends and means of development" Chapter 2 from "Development as Freedom", Oxford University Press. Instead of focusing solely on boosting the economy, his definition of advancement emphasizes the expansion of individual rights and liberties. Sen views freedom as the ultimate goal, but we need freedom to get there. Therefore, the aim and the means of development are freedom. But, The United Nations Development Programme (UNDP) defines development as "the process of expanding people's choices and enhancing their capabilities, including improving their education, health,

and safety” (UNDP, 2021, para. 1). Development can also be understood as a process of positive change that leads to the improvement of individuals, communities, and societies.

"Enhancement in the country's economic and social conditions" is what development means. More specifically, it describes advancements in the management of a region's human and environmental assets with the goal of creating wealth and enhancing people's quality of life. This includes a series of changes that modify behaviour, incorporate new information, enhance worker skills, increase industry knowledge, and further contribute to the creation of opportunities and growth. As a result, development is a complex process that incorporates sociological, psychological, and political facets of human existence and society with economic concerns.

The development was looked at by measuring macroeconomic variables, typically GDP per capita or per economy. The following limited the analysis, most often to economic growth, which had positive effects on the population by raising the employment rate, household income, and therefore consumption of goods and services. But this view of a partial representation of human life and activity overlooked real and urgent problems that people were having. Not only were they not addressed in time, but they also got worse and had implications for other areas of development, like poverty, rapid population growth, pollution, overcrowding in cities, health, education, resource management, and so on. So, it can also be argued that economic growth is not always a good thing for people. It definitely improves people's

material well-being by increasing the quantity of goods and services produced by the country.

The cost of environmental damage, like deforestation, land degradation, soil erosion, and air and water pollution, may be higher than the benefits of producing more goods and services during development. Greenhouse gas effects, bad weather, an irregular monsoon, global warming, acid rain, and other matters are already happening as a result of damage to the environment. In light of this, the current model of development needs to be substantially changed to promote both human life and the natural world. It also needs to show how economic growth and a friendly environment can coexist so that development can last for generations. That is why "sustainable development" is the main topic of the debate about development paradigms.

Development affects the growth and progress of people, communities, and societies as a whole. It has a number of good effects, like faster economic growth, higher living standards, and more social cohesion. Development leads to economic growth, which creates jobs, raises incomes, and helps people get out of poverty. It also makes life better by making healthcare, education, and housing better. Development brings people together and makes them feel like they are part of a community, which helps social cohesion. So, development is a way to achieve social justice for everyone. For people, communities, and societies to grow and move forward, development is very important.

Here are some of the most important reasons why development is important:

Economic Growth: Development leads to economic growth, which creates jobs, raises wages, and helps fight poverty.

Better Living Standards: Development makes living conditions better, such as better healthcare, education, and housing.

Social Cohesion: Development brings people together and makes them feel like they are part of a community, which helps social cohesion.

The emergence of global development agendas is a fascinating story of how people have gradually come to understand the complex connections between social justice, economic advancement, ecological preservation and world peace. It reflects the increasing global awareness of the need for a comprehensive approach to development that prioritizes social justice, environmental sustainability, human rights and institutional integrity in addition to material advancement. This multi-decade evolution demonstrates how scientific advancements, civil society involvement, evolving geopolitical circumstances and international debates constantly change global objectives. The Sustainable Development Goals (SDGs) were adopted in 2015, marking the conclusion of this historic journey.

For the planet and its people to survive, sustainable development is essential. To attain long-term prosperity, it entails striking a balance between social, economic, and environmental issues. Additionally, it offers humanity a wealth of opportunities to overcome the obstacles in the way of attaining economic development and growth. "Development that satisfies current needs without jeopardizing the capacity of future generations to satisfy their own." In its 1987 report, *Our Common Future*, the Brundtland Commission provided the definition of sustainable development that is currently most commonly used. Sustainable development (SD) means working

together to create a future for people and the planet that is inclusive, sustainable, and strong.

Humanity has a wealth of opportunities to overcome the constraints of economic growth and development thanks to the idea of sustainable development. In order to create a higher level of development that is embodied in the concept of sustainable development and supports prosperity for both present and future generations, sustainable development integrates economic, social, and environmental components while concentrating on the human, cultural, and social dimension, as well as on technological and scientific advancements and the interrelationships. This encourages us to preserve and improve our resource base by progressively altering the global development model and technological usage patterns. This calls for a long-term, inclusive, and integrated strategy that aids in changing our economies, environments, and societies as well as outdated attitudes, destructive patterns, and behaviours. The first decisive steps towards a sustainable future with dignity for everyone and leaving no one behind must be taken in order to respond ultimately and urgently. It seems that this new idea of sustainable development is the only way for humanity to advance, and it is also a noble goal.

The 17 comprehensive, worldwide goals that make up the Sustainable Development Goals (SDGs) must be accomplished by 2030. In order to address some of the most important issues facing the world today such as poverty, hunger, inequality, climate change, and environmental degradation, the Sustainable Development Goals (SDGs) have a broad and ambitious scope. Achieving one goal can have a positive effect on the others because they are interdependent and

connected. But the SDGs have taken a long time to develop. All stakeholders must conceptualize, comprehend, and agree in order to achieve the SDGs. The Stockholm Conference in the early 1970s marked the start of the SDGs' evolution. A number of conferences, proclamations, and agreements ensued.

The foundation for the Sustainable Development Goals (SDGs) was established in 1972 during the United Nations Conference on the Human Environment in Stockholm, Sweden. The World Commission on Environment and Development, led by Brundtland, articulated the concept of sustainable development as stated earlier. The 1990s were marked by a series of UN-sponsored conferences that focused on development for the 21st century. Among these, the Convention on the Rights of the Child was a milestone for the future of children, signed and enacted on September 2, 1990. In 1992, the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, resulted in the adoption of the first agenda addressing Environment and Development, known as Agenda 21. This served as a precursor to Agenda 30, which aims to achieve the Sustainable Development Goals. Additionally, the Cairo Conference on Population in 1994, the Beijing Conference on Women in 1995, and the World Health Organization's Health for All by 2000 initiative contributed to advancing discussions on development shaped by various determinants and underlying factors. Education remains a critical element in all these discussions.

In September 2000, representatives from 189 countries endorsed the Millennium Declaration, which led to the establishment of the Millennium Development Goals (MDGs), encompassing a set of eight goals with deadlines set for 2015. One of these MDGs focused specifically on attaining universal primary

education. The Rio+20 Summit in 2012 adopted the resolution titled “the Future We Want,” which ultimately solidified the Sustainable Development Goals as part of Agenda 30.

Only One Earth – The Stockholm Conference (1972)

Ultramodern global development ideas were first introduced at the 1972 United Nations Conference on the Human Environment in Stockholm, attended by representatives from over 100 countries. For the first time, environmental concerns were addressed on a global scale, highlighting that human progress and environmental conservation are not mutually exclusive. Held from June 5–16, 1972, this pioneering event set environmental goals for global growth and linked environmental issues with concepts like governance, development, and global governance. Its theme, “**Only One Earth**,” underscored the planet’s fragility and the need for shared responsibility.

The conference produced the **Stockholm Declaration**, containing 26 principles and a 109-point action plan for governments and international organizations. These emphasized preserving natural resources for present and future generations, laying the foundation for sustainable development. Many participating nations began integrating environmental protection, biodiversity conservation, and natural resource governance into their development strategies. The conference also sparked a new era of global environmental cooperation, leading to numerous international and national agreements and programs.

A landmark achievement was recognizing the interconnection between environmental protection and economic development, especially for developing

nations. India played a significant role, with Prime Minister Indira Gandhi's address highlighting the link between environment and poverty. She stressed that environmental conservation and poverty reduction are interdependent: poverty harms the environment, while environmental degradation perpetuates poverty.

The conference's influence was far-reaching. In India, it contributed to the **42nd Constitutional Amendment of 1976**, which added **Article 48A**, mandating the State to protect and improve the environment. Globally, Stockholm marked the start of comprehensive discussions on sustainable development, inspiring policies that consider ecological preservation as integral to economic progress. It firmly established that there is indeed “only one Earth” to protect for future generations.

Alma Ata Declaration and the Health for All by 2000

In 1975, the International Conference on Primary Health Care was held in Alma Ata, in the Kazakhstan region of the former Soviet Union, from September 6–12. Attended by 134 member nations and 67 international agencies, it was led by the World Health Organization and produced the Alma Ata Declaration, which launched the global campaign “Health for All by the Year 2000.”

The conference was grounded in the 1975 report *Alternative Approaches to Meeting Basic Health Needs in Developing Countries*. Its most significant contribution was a broad, holistic definition of health—not merely the absence of disease, but complete physical, mental, and social well-being. This perspective recognized that health cannot be achieved through healthcare measures alone, but depends on social and economic conditions such as equitable wealth distribution,

literacy, adequate nutrition, poverty eradication, and environmental quality. In essence, sustainable development was seen as both essential for improving health and as a goal that health improvements could help achieve.

The Alma Ata Declaration set out eight key objectives:

- Health Education – enabling informed and healthy lifestyle choices.
- Nutrition & Food Supply – ensuring access to nutritious food.
- Safe Water & Sanitation – preventing disease through clean water and sanitation.
- Maternal & Child Health – prenatal care, safe childbirth, and child immunisation.
- Immunisation – preventing infectious diseases.
- Control of Endemic Diseases – targeting region-specific illnesses.
- Appropriate Treatment – effective care for common diseases and injuries.
- Essential Drugs – affordable, safe medicines for all.

The Alma Ata vision prefigured much of the global development agenda. Both the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) incorporated these priorities—some directly, such as SDGs 3: Good Health and Well-being, and others indirectly, through goals on poverty, education, clean water, and reduced inequalities, reflecting health’s deep interconnection with sustainable development.

Our Common Future - The Brundtland Commission (1983-1987)

In line with the “Only One Earth” theme from the 1972 Stockholm Conference, which connected environmental sustainability, governance, and

development, the United Nations established the World Commission on Environment and Development (WCED) in 1983, led by Gro Harlem Brundtland, in response to escalating environmental degradation and increasing global inequalities. Its report released in 1987, titled “Our Common Future,” laid the groundwork for the contemporary understanding of sustainable development.

The Brundtland Commission articulated sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” The report merged environmental safeguarding, economic advancement, and social justice—the three pillars of sustainability—and highlighted their interrelatedness within the global development framework. Previously, development and environmental issues were often seen as opposing forces, and social justice was seldom included in developmental discussions.

The report expanded the definition of sustainability to encompass food security, human settlements, population dynamics, industry, and energy alongside environmental issues like deforestation, biodiversity decline, and climate change. This comprehensive approach acknowledged that achieving sustainable development necessitated addressing both short-term needs and long-range challenges.

Agenda 21: The Rio Earth Summit (1992)

The 1992 Rio Earth Summit, officially known as the United Nations Conference on Environment and Development (UNCED), is seen as a significant milestone in the quest for sustainable development. Taking place in Rio de Janeiro, Brazil, from June 3 to June 14, it built directly on the foundation laid by the 1987 Brundtland Report, transforming its vision into tangible global commitments.

The summit culminated in the Rio Declaration on Environment and Development, which included 27 guiding principles that delineate national rights and responsibilities in promoting sustainability. One of its most impactful outcomes was Agenda 21, a thorough action plan for sustainable development applicable at local, national, and global scales. Agenda 21 tackled the disparities pointed out in the Brundtland Report: the unsustainable production and consumption habits of the North alongside the poverty and challenges faced by the South, underlining the connections among environmental, economic, social, and governance issues.

Important international agreements were also established. The United Nations Framework Convention on Climate Change (UNFCCC) committed countries to confront climate change within the wider context of sustainable development. The Convention on Biological Diversity (CBD) centred not only on the conservation of biodiversity but also on its sustainable utilization and the fair and equitable distribution of benefits derived from genetic resources—merging environmental protection with economic and social fairness.

The Rio Summit clearly established that developmental progress and environmental protection are intertwined objectives. Although its primary focus was on environmental sustainability, the agreements, treaties, and frameworks developed there integrated the concept that sustainable development is the ultimate goal. Many of these principles would later become key components of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs).

In this context, the Rio Earth Summit can be viewed as a crucial milestone, laying the groundwork for a collaborative global strategy for sustainability—

connecting environmental responsibility, economic advancement, and social equity for both current and future generations.

Programme of Action – ICPD (1994)

As international conferences progressed with diverse themes, agendas, and methodologies, it became evident that sustainable development was a common priority. A significant milestone in this evolution was the 1994 International Conference on Population and Development (ICPD) that took place in Cairo. With participation from 179 nations, it resulted in the Programme of Action, which revolutionized global perspectives on population issues by placing women's empowerment and reproductive rights at the forefront of demographic and development strategies.

Building upon the Health for All by 2000 initiative, the ICPD Programme of Action highlighted the close interconnection between gender equality, healthcare, and education as essential to development as a whole. In the past, population policies often depended on coercive measures and numerical benchmarks. The Cairo conference represented a transformative shift, moving from target-oriented population control to a rights-based approach that recognized reproductive health as an integral component of individual well-being—aligning with the WHO's comprehensive definition of health encompassing physical, mental, and social well-being.

This change also recognized the impact of external factors like poverty alleviation, social justice, and human welfare on reproductive health results. The

Programme of Action shifted the focus from treating population as solely a regulatory concern to integrating it within the wider context of sustainable development.

It underscored the necessity for collaborative, multi-faceted strategies, bringing together poverty reduction, gender equality, education, and health policies. These principles significantly shaped subsequent international agreements and were incorporated into the Sustainable Development Goals (SDGs). Indeed, SDGs targets focusing on poverty eradication, quality education, gender equality, universal health coverage, and reproductive rights all stem from the ICPD vision.

Thus, the Cairo ICPD serves as a pivotal point in merging population, human rights, and sustainable development, transforming the global dialogue from control to empowerment, and influencing policy frameworks that continue to steer development initiatives around the globe.

Beijing Declaration and Platform for Action (1995)

The Fourth World Conference on Women, which took place in Beijing from September 4–15, 1995, was a pivotal moment in promoting gender equality and empowering women globally. With participants from 189 nations and various NGOs, the event resulted in the Beijing Declaration and Platform for Action—a detailed policy framework focusing on 12 essential areas: poverty, education, health, violence against women, armed conflict, economic inequalities, decision-making, institutional frameworks, human rights, media representation, environmental concerns, and the rights of girls.

These focus areas are closely linked to the Sustainable Development Goals (SDGs), particularly SDGs 5 (Gender Equality), SDG 4 (Quality Education), SDGs 3 (Good Health and Well-being), and SDG 10 (Reduced Inequalities). The Platform advocated for a participatory, rights-based approach, calling on governments to incorporate gender perspectives into all policy domains.

Subsequent assessments—Beijing +5, +10, +15, and +20—evaluated achievements and obstacles, impacting the development of the SDGs' formulation, objectives, and monitoring processes. By connecting social, economic, and environmental aspects through a gender perspective, the Beijing Conference transformed the development narrative from a focus on mere economic growth to one centered on inclusive, equitable, and sustainable human development. This shift ensured that gender equality remained a fundamental component of the 2030 Agenda, influencing global priorities for a more equitable and sustainable future.

Millennium Declaration and Millennium Development Goals (2001 – 2015)

At the beginning of the 21st century, the international community brought together years of concepts, beliefs, and strategies into a comprehensive framework during the Millennium Summit in 2000, leading to the Millennium Declaration, which was approved by 191 countries. Initiated in 2001, it laid out eight Millennium Development Goals (MDGs) accompanied by 21 specific targets aimed at alleviating extreme poverty and hunger, fostering gender equality, enhancing maternal and child health, combating diseases, protecting the environment, and reinforcing global partnerships.

The MDGs were influenced by various UN conferences and declarations from the 1990s, including the 1995 Copenhagen Declaration on Social Development, which suggested broad social development initiatives. A significant precursor was the 1996 report titled “Shaping the 21st Century,” which proposed six measurable “International Development Goals”: cutting poverty in half, achieving universal primary education, abolishing gender inequality in educational settings, lowering infant and child mortality rates, decreasing maternal mortality, and guaranteeing universal access to reproductive health by 2015.

Another important document was UN Secretary-General Kofi Annan’s 2000 report “We the Peoples: The Role of the United Nations in the 21st Century,” which, along with “Shaping the 21st Century,” shaped the discussions at the Millennium Summit. In 2001, Annan released a “Roadmap towards the implementation of the United Nations Millennium Declaration,” formally establishing the MDGs.

The MDG framework was based on three main pillars—human capital, infrastructure, and human rights:

- Human capital: education, healthcare (covering HIV/AIDS, tuberculosis, malaria, and reproductive health), and nutrition.
- Infrastructure: energy, clean water, information and communication technology (ICT), sustainable agriculture, transportation, and environmental management.
- Human rights: empowerment of women, reducing violence, political participation, equitable access to public services, and secure property rights.

Drawing inspiration from the capability approach of Amartya Sen and Martha Nussbaum, the MDGs sought to enhance human potential and improve living conditions, providing measurable global targets that directed development initiatives until they were succeeded by the SDGs in 2015.

The Millennium Development Goals (MDGs), established in 2000, set forth eight international objectives with 21 specific targets to be accomplished by 2015.

Goal 1: Eradicate Extreme Poverty and Hunger

1A: Reduce by half the percentage of individuals living on less than \$1.25 per day.

1B: Ensure decent job opportunities for women, men, and youth.

1C: Halve the number of people experiencing hunger.

Goal 2: Achieve Universal Primary Education

2A: Guarantee that all children, regardless of gender, complete their primary education.

Goal 3: Promote Gender Equality and Empower Women

3A: Eliminate gender imbalances in primary and secondary education by 2005 and at all educational levels by 2015.

Goal 4: Reduce Child Mortality

4A: Decrease the mortality rate of children under five by two-thirds.

Goal 5: Improve Maternal Health

5A: Lower the maternal mortality ratio by three-quarters.

5B: Ensure universal access to reproductive health services.

Goal 6: Combat HIV/AIDS, Malaria, and Other Diseases

6A: Halt and reverse the spread of HIV/AIDS.

6B: Ensure universal access to treatment for HIV/AIDS by 2010.

6C: Stop and reverse the spread of malaria and other major diseases.

Goal 7: Ensure Environmental Sustainability

7A: Incorporate sustainable development principles into policies and reverse the loss of environmental resources.

7B: Significantly diminish biodiversity loss by 2010.

7C: Halve the percentage of people without sustainable access to safe drinking water and sanitation.

7D: Enhance the living conditions of at least 100 million slum dwellers by 2020.

Goal 8: Develop a Global Partnership for Development

8A: Promote an open, rule-based, and non-discriminatory trading and financial system.

8B: Address the specific needs of least developed countries (LDCs).

8C: Consider the needs of landlocked countries and small island developing states.

8D: Solve the debt issues faced by developing countries for long-term sustainability.

8E: Provide affordable essential medications in developing nations.

8F: Increase access to new technologies, particularly ICT, through cooperation with the private sector.

These objectives established a cohesive framework for addressing global poverty, inequality, disease, and environmental issues.

It was adopted by 191 United Nations members. The MDGs were not only about member states; several organizations that have been supporting development worldwide also pledged to aid in the pursuit of the MDGs. At least twenty-two of these foreign organizations stepped up to offer their support.

Evolution of Global Development Agendas: From MDGs to SDGs add para

Global development frameworks have evolved significantly over the past few decades, reflecting changing priorities and growing recognition of interconnected challenges. The Millennium Development Goals established in 2000 provided a focused set of targets aimed at reducing poverty, improving health, and expanding education (United Nations, 2015).

While the MDGs achieved notable successes, including increased school enrollment and reduced extreme poverty, they were criticized for their top-down design, limited scope, and insufficient attention to inequality within countries (Sachs, 2012). These limitations led to the development of the Sustainable Development Goals, adopted in 2015, which introduced a more comprehensive and integrated framework.

The SDGs emphasize universality, inclusivity, and interdependence among goals, addressing economic, social, and environmental dimensions simultaneously (United Nations, 2015). However, scholars argue that the breadth and complexity of the SDGs pose significant challenges for implementation, particularly in resource-constrained settings (Fukuda-Parr, 2016).

Consequently, while the SDGs represent a more holistic vision of development, their effectiveness depends on how they are translated into local contexts.

A Vision for Change: The Sustainable Development Goals and the 2030 Agenda

Beyond merely listing objectives, the Sustainable Development Goals offer a logical framework for tackling the world's most urgent issues. Instead of concentrating on personal issues, the SDGs acknowledge the connections among hunger, health, education, economic opportunities, environmental degradation, peace, and justice.

They aim to eradicate poverty in all its manifestations, eradicate hunger and malnourishment, encourage lifelong learning, guarantee gender parity, supply clean water and sustainable energy, support inclusive institutions, encourage decent work, lessen inequality, safeguard ecosystems, fight climate change, and cultivate peaceful societies.

The Sustainable Development Goals (SDGs) are a set of 17 global goals that the United Nations established in 2015 to replace the Millennium Development Goals as the framework for development between 2015 and 2030. Ending extreme poverty within 15 years while guaranteeing the long-term peace of both people and the planet is a universal, indivisible, and revolutionary vision. The Sustainable Development Agenda was developed as a plan for prosperity, the planet, and people. The goals are interconnected and address poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, urbanization, the environment, and social justice. These goals seek to reduce poverty, protect the environment, and guarantee prosperity through equitable development and environmental sustainability.

These objectives are a component of the broader 2030 Agenda for Sustainable Development, an evidence-based framework that has 232 indicators and 169 targets

that need to be accomplished by 2030. (2015, United Nations General Assembly). Countries are free to choose their own priorities and ideals under this non-binding agreement. Following the general steps of the policy-planning cycle, from goal and indicator prioritization to policy review, decision-making, and implementation, they are primarily implemented at the national level.

The Sustainable Development Goals (SDGs) have been characterized as universal, transformative, and integrative, encompassing the concerns of all countries and aiming to link environmental sustainability and human development goals under a single global agenda, whereas the Millennium Development Goals (MDGs) addressed poverty reduction in developing nations.

In order to address poverty, hunger, health, education, gender equality, and environmental sustainability, the United Nations (UN) adopted the Millennium Development Goals (MDGs) in 2000. The Sustainable Development Goals (SDGs), a collection of 169 targets and 17 goals designed to advance sustainable development worldwide, were adopted by the UN in 2015. Poverty, education, health, gender equality, clean water and sanitation, and climate action are just a few of the many topics that are covered by the SDGs (United Nations, n.d.).

To gauge progress toward sustainable development, the SDGs include precise goals and metrics. For instance, Goal 7 of the SDGs seeks to guarantee that everyone has access to modern, affordable, dependable, and sustainable energy. The percentage of the population with access to electricity is one of the metrics used to track progress toward this objective.

According to the United Nations (n.d.), the Sustainable Development Goals (SDGs) are "a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030." They are a thorough framework designed to guarantee sustainable growth by balancing the environmental, social, and economic facets of development.

All aspects considered, the Sustainable Development Goals are a major international endeavour to advance sustainable development and deal with some of the most important issues of our time. All nations and stakeholders must work together and be committed to achieving the SDGs.

The 17 SDGs are classified into five categories, namely:

People (goals 1-6): These goals focus on eradicating poverty, ensuring food security, promoting good health, providing quality education, achieving gender equality, and ensuring access to clean water and sanitation.

Planet (goals 7-9): These goals aim to ensure access to affordable and clean energy, promote sustainable industrialization, innovation, and infrastructure, and combat climate change and its impacts.

Prosperity (goals 10-12): These goals focus on reducing inequality, promoting sustainable economic growth, and fostering innovation and sustainable consumption and production.

Peace (goal 16): This goal aims to promote peaceful and inclusive societies for sustainable development, provide access to justice, and build effective, accountable, and inclusive institutions.

Partnerships (goal 17): This goal aims to strengthen the means of implementation and revitalize global partnerships for sustainable development.

The complex connections and relationships between the different Sustainable Development Goals and their related targets are referred to as the SDGs interlinkages. In order to create a complex network of relationships, these connections are made both within and between individual goals. This interconnectedness highlights how achieving one goal can affect and have an impact on achieving other goals.

For integrated governance and policy coherence, it is essential to comprehend these connections. A more thorough and successful strategy for sustainable development is ensured by integrated governance, which suggests a holistic approach that takes into account the relationships and interdependencies among various goals and targets. Aligning different policies to prevent conflicts and contradictions and make sure that advancements in one area don't impede those in another is known as policy coherence.

To put it simply, developing a cohesive and cooperative strategy for achieving the SDGs requires an understanding of the connections between the targets and the SDGs. By addressing interrelated issues and encouraging concerted efforts across multiple development dimensions, this holistic approach increases the likelihood of attaining sustainable development.

The five Ps are crucial elements that promote the SDGs:

- People: ensuring everyone is included while putting a focus on fairness, respect, and basic needs.
- Planet: Preserving Earth's ecosystems and reestablishing the health of the environment.
- Promoting equitable economic growth that places a high priority on environmental sustainability is what prosperity is all about.
- Peace: Encouraging fairness, respect for the law, and conflict-free communities.
- Collaboration: Strengthening global solidarity through coordinated actions from many parties.

What Sets the SDGs Apart?

The SDGs are essentially different from earlier frameworks in a number of respects.

- First, they emphasize the universality of concerns like inequality, climate change, and peace.
- Because they are interrelated, improvements in one area will not have a detrimental effect on another.
- Because they were developed through the most thorough consultation process in UN history, they are inclusive.
- They emphasize the value of data and support comprehensive statistics to track disparities and inform policy choices.
- They support localization, recognizing that in order for goals to be successfully implemented, they must be adjusted to local and national conditions.

Unlike the MDGs, the SDGs are applicable to all people and nations, the rich and the poor. They stress the significance of fairness, transparent data, community involvement, and consistent policies. "Leave No One Behind" is a core philosophy that calls for concentrating on the most vulnerable populations, including women, children, people with disabilities, indigenous peoples, refugees, and the very poor.

Fostering an Innovative Development Ethic

The progress of the SDGs has altered the global outlook on development. It signifies a change from fragmented and altruistic tactics to progressive, systemic, and rights-based ones. The Sustainable Development Goals (SDGs) seek to establish a world with equitable economic systems, inclusive social structures, and resilient environmental systems. They exhibit a commitment to connection, creativity, accountability, and group responsibility.

In the face of global challenges like pandemics, climate disasters, growing inequality, and geopolitical tensions, the SDGs promise that a better future is achievable if humanity unites with courage, empathy, and resolution.

In order to monitor progress, inform policy, and ensure accountability of all stakeholders, a strong framework of indicators and statistical data is necessary for a follow-up and review mechanism for the 2030 Agenda for Sustainable Development. At the local, national, regional, and international levels, indicators will serve as the foundation for tracking progress toward the SDGs. A strong indicator framework will transform the SDGs and their goals into a management tool that will assist nations and the international community as well as subnational and local levels in creating

implementation plans and allocating funds appropriately. Additionally, they will act as a report card to gauge their advancement toward sustainable development and to help guarantee that all parties involved are held accountable for reaching the SDGs.

We also emphasize that sustainable development goals should be aspirational, action-oriented, clear and simple to convey, global in scope and universally applicable to all nations, while also taking into consideration various national realities, capacities, and developmental stages and honouring national policies and priorities. It is also acknowledged that in order to achieve sustainable development, the goals should be prioritized and address priority areas.

Achieving sustainable development requires localizing the SDGs. It entails adjusting the SDGs' implementation to the unique circumstances of every nation or area. To do this, local priorities must be determined, local stakeholders must be involved, and local policies and plans must incorporate the SDGs. As policies at the local level, SDGs localization can also help guarantee that no one is left behind in the development process.

Localising Sustainable Development Goals

“Localizing” is the process of considering local contexts in the achievement of the 2030 Agenda, from the setting of goals and targets, to determining the means of implementation and using indicators to measure and monitor progress. Localization relates to how the SDGs can provide a framework for local development policy and to how local and regional governments can support the achievement of the SDGs

through action from the bottom and to how the SDGs can provide a framework for local development policy.

A structural foundation for the nation's democratic decentralization was established by the 73rd and 74th Constitutional Amendments. Following the Gram Panchayat Development Plan (GPDP) initiative, all of the nation's Gram panchayats began preparing development plans. With this strategy, all Gram panchayats are expected to base their programs and plans on regional goals. The Gram Sabha's recommendations are used by Gram Panchayats to formulate their plans. education as well as the fields that support it. Local governments have the opportunity to carry out many of these initiatives at the local level thanks to the GPDP.

In order to serve as a point of convergence between national governments, community-based groups and other local actors, as well as local and regional governments and their associations, the UN launched the Local 2030 platform. To accomplish the SDGs by 2030, different parties must effectively collaborate.

To make it their own, they might use the SDGs, which are universal and a roadmap for progress. The goals are represented by interconnected themes, and fulfilling a theme is the same as fulfilling a goal of some sort. The Government of India has chosen a thematic approach since these are relatable to the community and local elected representatives (ERs). It attempts to provide the Gram Panchayats a vision of the theme's purpose and core ideas. This has to be brought into a Local Indicator Framework (LIF).

The localization of the SDGs aids local actors and stakeholders in collaboratively finding solutions and executing activities aimed at meeting the targets for SDGs attainment at the community level. This approach is particularly crucial for achieving Goal 4 – Quality Education. Localization focuses on how local and higher-tier governments, particularly sub-national governments, strive towards realizing the SDGs through planning and implementation from the grassroots level, as well as how the SDGs framework can facilitate this process. Therefore, it involves participatory methods in planning, execution, and monitoring.

The Local Indicator Framework (LIF), initially created in Kerala and subsequently in India, serves as a valuable set of indicators for tracking progress on the 2030 Agenda for Sustainable Development. Indicators play a pivotal role in monitoring advancements towards the SDGs at local, national, regional, and global scales. They aid in formulating strategies and distributing resources by transforming the SDGs and their objectives into a practical management tool.

At the global scale, SDGs are evaluated using international targets and indicators to gauge progress among different countries. The SDGs India Index, developed by NITI Aayog, assesses the advancement of SDGs across states and provides rankings based on selected indicators from the NIF. States are developing their own State Indicator Frameworks, with some advancing to create District and Block Indicator Frameworks. Ultimately, this process leads to data and frameworks at the Gram Panchayat level. With the Gram Panchayat development plan established as part of the People's Plan Campaign and Quality Education being one of the SDGs, it is crucial to analyse educational status through the lens of the SDGs, including their

goals, targets, and indicators in any region of the country. This is particularly relevant in Kerala, where the local governance structure is robust, and education is a key delegated function supported by its institutions and personnel.

The following lists the main themes for the LIF:

- Theme 1 Poverty free and enhanced livelihoods in Village
- Theme 2 Healthy Village
- Theme 3 Child Friendly Village
- Theme 4 Water sufficient Village
- Theme 5 Clean and Green Village
- Theme 6 Self-sufficient infrastructure in village
- Theme 7 Socially secured Village
- Theme 8 Village with Good Governance
- Theme 9 Engendered Development in Village

These nine themes for localizing SDGs in Panchayati Raj Institutions in India are interwoven with the Sustainable Development Goals.

The idea and implementation of the Local Indicator Framework for SDGs (LIF-Kerala) to track and assess local progress toward the objectives originated in Kerala. A collection of indicators that represent the state's distinct social, economic, and environmental priorities are incorporated into LIF-Kerala. It makes it possible for local governments to monitor their progress, pinpoint problems, and create focused plans for sustainable growth.

Likewise, to track success at the local level, the Indian government created the Local Indicator Framework for SDGs (LIF-India). While allowing for customization and localization of indicators depending on the unique requirements of various states and regions, LIF-India is consistent with the national-level indicator architecture. It helps local governments to share best practices, monitor their progress, and support evidence-based decision-making.

“Goals” are a broad and interdependent future development framework. “Targets” are actionable points for achieving the goals. The targets need to be fulfilled to achieve the goals. “Indicators” are needed to gauge the attainment of goals. A quantitative statistic that offers data for decision-making is the indicator. In order to achieve the SDGs, the Local Self Governments (LSGs) formulate the Gram Panchayat Development Plan (GPDP) and oversee its implementation based on the localised SDGs targets and indicators. The state planning department, line departments, LSG officials, elected representatives, and others have all been consulted in order to adapt the SDGs targets and indicators at the LSG level.

The resulting Local Indicator Framework encompasses the 5Ps and represents the UN statement in which all nations agreed to set out on a path to a better future for all, where no one is left behind, including Gram Panchayats (MoPR, 2023). They should be quantifiable, be capable of generating required information from the LSG databases and statistical systems of the line departments. From the list indicators as per the national indicator framework, the local self-government can:

- a). Drop indicators that are not relevant to LSGs in their state
- b). Include indicators that are fully aligned
- c). Improve indicators that are partially aligned and
- d). Include indicators that are missing.

Existing expertise in goal-setting, monitoring, and implementation can and should be used to help achieve the SDGs. The objectives at the local government level, as expressed through themes, targets, and indicators, are aspirational in character, pertinent and align with national policies and priorities while also taking into account local realities in a clear and understandable way.

Local government is guaranteed in the localization of SDGs through an iterative process that links national and global indicators down to the grassroots level. The majority of the SDGs' targets and indicators must be met locally. The majority of SDGs pertain to topics that have been devolved to the local governments.

Education is the most important factor in a developing nation like India. The New Education Policy is a thorough action plan. It covers every facet that will result in the full integration of disabled students into the educational system. If education is still inaccessible to every person in the nation, we will fail as a nation. The 2030 Agenda for Action and the Sustainable Development Goals have given inclusive education for the SDGs new life. With the passage of SDG 4, which seeks to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all," the agenda establishes a comprehensive universal education program.

Only when the several elements that have contributed to the growth of the education sector are taken into account can education be accomplished. These are dispersed among several other SDGs. In this regard, the incorporation of sustainable development goals into educational systems encourages the inclusion of these important sustainability concerns in regional and worldwide contexts in the curriculum. It also demonstrates how education has been incorporated into the conversation about sustainable development. Thus, determining the connections between different objectives is necessary. Many of these can only be accomplished through local initiatives. Therefore, a framework for local development policy is required in order to localize the SDGs. This will also show how local and regional governments can support the achievement of the SDGs through action from the bottom. Gram Panchayat Development Plan provides an opportunity to achieve these.

It is crucial for national education policies, curricula, teacher training, and assessment procedures to explicitly integrate these themes. Notably, human rights education provides a fundamental framework for addressing the rights of individuals with disabilities, making sure that such content is presented inclusively so that all learners, regardless of their abilities, can benefit equally.

The role of SDG 4 and the relation with respect to 29 subjects transferred to the Panchayats shows that there are areas in which Panchayats have a role and the potential of contributing to the quality of education. Those subjects with respect to goal four are:

- Education including primary and secondary school, Technical training and
- Vocational education, Adult and non-formal education and Libraries

The intricate sustainability issues that civilizations face transcend borders and various subject areas when it comes to educational materials like curriculum. Therefore, important topics like poverty, climate change, and sustainable manufacturing must be covered in education. In order to prepare students to comprehend and react to the changing world, the Sustainable Development Goals are being incorporated into educational systems. This encourages the inclusion of these important sustainability issues in both local and global contexts in the curriculum. Additionally, education has become entwined with the conversation about sustainable development. It discusses certain global mechanisms that helped inclusive education for sustainable development come into being and demonstrates how these two streams of change created solid foundations for the movement over time.

Clustering the targets and setting priorities for the strategic interventions to address the outcome follow next after the inter-sectoral goal has been decided. Prioritizing the interventions can be done by taking into account the amount of money available and how simple the work is to complete. By mapping vulnerable populations according to factors like age, family size, occupation, and place of residence, Gram Panchayats are able to evaluate the requirements of each group. To accomplish the aims, Gram Panchayats can map resources, services, human resources, and schemes. Gram Panchayats have the authority to take action to enable communities and community-based organizations to take part in programs. Gram Panchayats can motivate and promote mobilization from socio-political-religious leaders, as well as host awareness-raising programs and house visits. To get wider approval for this, the Gram Panchayat can discuss the issues identified and prioritized

in the Gram Sabha meeting. It is better to start with solving the most relevant issues accordingly and find out the solution of the problems also.

A set of key tasks is given in each theme for the easy initial discussion of the participants. This also will give them an idea that SDGs is all about coordinated efforts for achieving results of quality of education. The following methodology may be helpful in planning for the Gram Panchayats to achieve the quality of education.

1. Setting the dreams or objectives to achieve the goals
2. Develop action plan for achieving the objectives
3. Resources to help in implementing the action plan
4. Identify people or human resources that can support to implement this action plan

A set of modified targets and indicators are proposed based on the core SDGs and other associated SDGs related to the theme. This will help to monitor the progress of the outcomes and targets. While the national level targets and indicators remain the same, Gram Panchayat level targets and indicators are modified for easy monitoring. Targets are brought down to the operational level of a Gram Panchayat based on the availability of data at the level of a Gram Panchayat.

At the local level, the pursuit of the Sustainable Development Goals (SDGs) should be based on leveraging existing experiences in setting goals, monitoring outcomes, and executing plans. Goals at the Gram Panchayat (GP) level are crafted to align with national priorities while being adapted to local circumstances. These objectives are structured around themes, targets, and indicators that are both aspirational and feasible. The localization of the SDGs is implemented through a

continuous process that connects national and global data with grassroots realities. Activities are devised with specific timelines and milestones anchored in the identified targets and indicators. These activities constitute the essence of particular projects, which are subsequently integrated into the Gram Panchayat Development Plans (GPDP).

Panchayats fulfill various roles throughout this process. Not every activity is directly carried out by them—some are conducted by government departments, agencies, or community groups. In some instances, Panchayats concentrate on planning, while in other situations, they facilitate, promote, support, or oversee initiatives. They may also advocate higher government levels to meet local demands. Important actions at the GP level include advocacy, initiation, development, facilitation, capacity building, mobilization, execution, and evaluation of activities.

This process signifies the formation of strategic movements that aim to realize long-term local objectives. Each Panchayat ought to have a vision for every theme, which is then translated into targeted goals that align with relevant SDGs. These vision statements are further subdivided into feasible local targets, the majority of which correspond to national targets. Clearly articulated indicators are crucial for tracking progress. Panchayats should define these goals and indicators from their own viewpoint, ensuring they are contextually relevant.

Targets and indicators are organized into categories of immediate, short-term, and long-term priorities. It is vital to tackle all three timelines concurrently—taking prompt action on pressing issues, executing short-term plans, and establishing foundations for long-term results. This integrated strategy guarantees continuous

advancement toward the achievement of the SDGs at the grassroots level.

The Sustainable Development Goals (SDGs), particularly SDG 4, strive to provide inclusive, equitable, and high-quality education for everyone. In Attappadi—a rural and tribal area in Kerala—this framework holds particular significance due to its unique socio-economic, cultural, and geographic obstacles. While both global and national SDGs frameworks set forth broad objectives, their adaptation to the local Gram Panchayat context is essential for addressing conditions such as elevated dropout rates, insufficient infrastructure, language challenges, and socio-cultural barriers.

The Gram Panchayat Development Plan (GPDP) acts as the primary tool for converting SDG 4 into practical strategies. Panchayats, along with schools, community organizations, and government bodies, collaborate to improve enrolment, upgrade facilities, encourage community engagement, and track educational progress. This includes both direct interventions and support for initiatives led by other stakeholders.

An important aspect of this approach is the Local Indicator Framework (LIF), which allows for monitoring education-related indicators tailored to the local context, such as attendance, transition rates, learning outcomes, and access to digital resources. Using the LIF, Panchayats can establish phased objectives—immediate (enhancing enrollment and infrastructure), short-term (staff training, and culturally and linguistically responsive teaching), and long-term (developing life skills, critical thinking, and employability).

In Attappadi, education must be viewed in conjunction with wider development issues such as poverty, health inequities, and preserving cultural heritage. The SDG 4 framework advocates for an integrated approach that ensures educational projects contribute to comprehensive community development. By integrating education into sustainable development strategies, the region can close learning gaps, boost human capital, and empower tribal youth while protecting cultural identity.

This method demonstrates how global objectives, when adapted through participatory planning and effective monitoring, can produce focused, impactful results in marginalized areas like Attappadi, linking quality education to sustainable and inclusive growth.

Theory Related to Attappadi: The Tribal Nuclei of Kerala

A tribe consists of individuals who share the same language, culture, religion, or background. Every tribe, also referred to as the Adivasi's or the original occupants, is unique and often has traditions that distinguish it from other ethnic groups. The people in the tribe are devout, modest, and submissive. Most of these tribal communities are economically poor, physically dangerous, and culturally inaccessible. They were a uniform people living in isolated, steep, and forested environments. Moreover, their lack of organisation and knowledge often made it difficult for them to view the many socioeconomic issues from the right perspective. Tribal people are the oldest group of people living in India today. Approximately 476 million indigenous peoples, or 6.2% of the world's population, reside in 90 different nations. The world's second-largest tribal population is found in India. Indian society

has always included tribal communities, dating back to the time of the Ramayana and the Mahabharata. The indigenous people of the nation have distinctive lifestyles and customs along with rich traditions, cultures, and heritage. In spite of certain regional differences, the tribes have a lot in common, such as living in a relatively isolated location and being more homogeneous and self-sufficient than the non-tribal social groups. According to GOI (2011) reports, the districts of Wayanad (31.24%), Idukki (11.51%), Palakkad (10.10%), and Kasaragod (10.08%) have the highest concentration of Scheduled Tribes (ST) in the state. The Attappadi region of Palakkad District is referred to as the tribal nuclei of Kerala and is one of the 43 tribal blocks in the nation.

Attappadi, a region of the Palakkad district of Kerala nestled in the Silent Valley National Park and Nilgiri ranges of the Western Ghats, has a Scheduled Tribe population of 27,121 with three distinct Scheduled Tribes—the Irular (77.6 percent), the Mudugar (15.7 percent) and the Kurumbar (6.7 percent) and they located in three Gram Panchayats -Agali, Pudur and Sholayur. A total of 66,171 persons reside in Attappadi, of which 41 percent are tribes. The literacy rate of tribes is only 38.62 percent and above 80 percent of tribes are below poverty line (Census, 2011). It is a tribal block in Kerala is no exception, where historical disparities and socio- economic challenges have hindered the educational progress of its indigenous population.

In India, Scheduled Tribes, commonly referred to as "Adivasis,"¹ have been relegated to "low status" and are frequently socially and physically cut off from the broader populace. To address their socio-economic backwardness, several welfare programs were started after independence. Tribally-specific education differs from

public schooling. Only after taking into account their culture should it be administered. The failure of the numerous educational initiatives among tribal members indicates that their ability to learn and acquire information differs greatly from that of the general population. Tribal education emphasises the value of Non-Formal Education (NFE) for tribal pupils at the primary school level in this regard. This is a reference to education in a setting that is friendly to tribes. Tribal pupils are treated well by alternative schools under non-formal education. It was started under the Sarva Shiksha Abhiyan (SSA), which was implemented in India during the District Primary Education Programme (DPEP) era. This plan was established in accordance with the 1986 National Policy on Education. Although the Indian Constitution provides for the protection of the tribal community and provisions for the educational advancement of tribal children, there is still a growing gap between tribes and other groups in the educational system. The demand for knowledge about alternative schools and tribal education was heightened by India's current educational system and the low status of tribal education.

The Union and State Government have together introduced a number of policies, programmes for different measures to provide education and eradicate educational barriers for the tribals. The educational programmes are mainly implemented by two Ministries, namely, the Ministry of Human Resources Development through the Department of Education and Ministry of Tribal Affairs. The State Government has offered scholarships and subsidies that incentivise girls and young women to seek secondary and tertiary education. Vocational training schemes are equally important for girls who do not plan to pursue more traditional

professional courses. There are two promising new initiatives announced by the State Government. The Gotra Bandhu Scheme aims to engage tribal teachers in primary schools and the Gotra Valsalya Nidhi scheme which is an endowment for tribal girl children born after April 2017 to ensure they are registered at birth, immunised and educated to a minimum level of Standard 10. The endowment can be extended to paying for higher education (STDD, 2020)

Even though Kerala has excellent public health and literacy rates, the people of Attappadi particularly the indigenous population remain extremely behind in these areas. The educational landscape of Attappadi presents an intricate blend of advancement and ongoing issues, making the SDG 4 framework particularly significant. Although school enrollment is nearly universal and there are multiple educational institutions including 16 Lower Primary Schools, 5 Upper Primary Schools, various High Schools, and several tribal hostels—educational outcomes still fall short of both state and district averages. The literacy rate stands at approximately 62%, significantly trailing Kerala's overall achievement of over 90%, with earlier statistics showing an even lower figure of 54%, underscoring a longstanding educational disadvantage.

Persistently high dropout rates pose a major issue, especially among girls, whose educational and literacy attainment is notably lower. This suggests that while schools are accessible, challenges with student retention and quality of education are prevalent. Contributing factors include a curriculum that is inadequately adapted for students from tribal communities, a lack of vocational and job-focused educational

opportunities, and restricted options for skill development outside of academics—particularly in sports and extracurricular activities.

The existence of both public and private schooling alternatives, along with hostel accommodations for boys and girls, provides a fundamental framework for education delivery. Nonetheless, the trend of many students attending schools outside Attappadi signals a lack of confidence in the local institutions' ability to deliver quality education. This situation necessitates targeted interventions in line with SDG 4, emphasizing inclusive and equitable education, gender equality in learning opportunities, culturally appropriate teaching methods, and life skills development.

Incorporating skill-based training, sports initiatives, and career counselling into the local curriculum could help tackle employability challenges and decrease dropout rates. Enhancing the involvement of Gram Panchayats in educational planning, backed by the Local Indicator Framework (LIF), can facilitate ongoing oversight and locally tailored solutions. By addressing deficiencies in quality, relevance, and inclusivity, the educational system in Attappadi can more effectively align with the vision of SDG 4, empowering the region's youth and tackling deep-seated educational inequalities.

Theoretical Framework of Life Skills

Life Skills have been considered as an important part in shaping a person's future. However, defining life skills is also important. What do we mean by life skills, why are they important, what constitutes the spectrum of life skills, when and where do we require them, how can one achieve these life skills and many such questions

arise when we try to define life skills. First and foremost is that the term life skills is a broad term. Many have tried to define life skills. Many international organisations, UN agencies, academics and governments have tried to define life skills according to the situations in which they are working. Policies and programmes have evolved out of these definitions. In a very simplistic way, life skills are the skills required for the human kind to live in this world. But this explanation does not suffice.

Everyday life is lived through many challenges, aspirations, demands as well as opportunities. In order to fathom through these required abilities, capabilities and capacities. These are about knowledge and skills. However, it is beyond knowledge and skills, but also about how one approaches these issues, how her knowledge and skills are used, what is the attitude of the person with regard to the issue at hand and how one uses the knowledge and skills that have been gained over time to do this. It is also about changes in behaviour too.

Thus, as Ozmete (2011) mentions, Life skills are a set of abilities and competencies that help individuals navigate the challenges and demands of everyday life, both personally and professionally. They encompass a range of skills that enable effective communication, problem-solving, decision-making, and adaptability, among others. The study categorizes life skills into cognitive (critical thinking, decision-making), social (communication, teamwork), and emotional (self-awareness, stress management) domains. These skills are not innate but are developed through structured education and real-world experiences. These do not happen in a vacuum and so the environment or the surrounding conditions in which one lives also becomes crucial. It goes on to understand the social, cultural, economic, political, professional

and family environment. Thus, it is not about education alone which brings in life skills but overall development becomes important. That is where the role of sustainable development and the goals envisaged for 2030 become a major factor.

Many academics and practitioners consider life skills as a set of tools to lead an effective life. This set of tools are applicable to many situations and not just for one aspect in life. For example, an effective communication skill one possesses is applicable to many situations in life. It can be applied in job situations, professional contexts and also on personal matters.

The World Health Organisation has tried to define life skills as abilities for adaptive and positive behaviour, that enable individuals to deal effectively with the demands and challenges of everyday life. This definition was developed in the context of their pursuit for life skills for Psycho social competence. WHO had defined Health as a state of physical, social and mental wellbeing and not just absence of diseases. Psychosocial competence becomes important in this. WHO has defined Psychosocial competence as a person's ability to deal effectively with the demands and challenges of everyday life. It is a person's ability to maintain a state of mental well-being. This is about one's ability to adapt to various situations and requires behavioural change. As one can see, this definition is closely related to the definition of life skills. Or it can be argued that life skills include skills for psychosocial competence.

This was just on the life skills for psychosocial competence. Likewise, there are innumerable situations and innumerable life skills. It differs from place to place and contexts to contexts. However, we can still consolidate these into a few core sets of life skills. This includes decision making, problem solving, creative thinking,

critical thinking, effective communication, interpersonal relationship skills, self-awareness, empathy, coping with emotions and coping with stress.

At every point of life, people are faced with the need for decision making. Any action one takes is dependent on a decision made. There could be many options, but a decision has to be made. Thus, the core competency to make decisions becomes one of the important skills in the core set. This skill is well connected with another skill, that of problem solving. Many decisions are about dealing with problems and hardships. Here again, identifying the solutions, prioritising them and finally making a decision is crucial. Such a problem solving and decision-making action cannot happen without a creative thinking. Actually, this skill of creative thinking helps people to search for available opportunities, potentials, barriers, difficulties, limitations and understand the consequences of actions. Creative thinking is not only about dealing with problems, but also about thinking for the future. This is definitely intertwined with critical thinking which is the ability to analyse the opportunities and others mentioned above as well as relevant information including experiences and learnings.

Even if the person has mastered the skills of decision making, how effectively she communicates is important. It is not only about language skills, but using the language to suit the needs as per the society, people and culture. It is about both verbal and nonverbal communication. It is not only about expressing what we decide, what we know and what we have understood, but also about our thinking, aspirations, needs and fears. This is important for developing interpersonal relationships, which itself has a set of skills. This cannot happen without knowing ourselves who and what we

are and that is where the self-awareness skills become important. For interpersonal relationships, while knowing ourselves is important, It is also important to know about the life of others, their feelings and emotions. They would be different from us, but having empathy will help us to understand them.

This would become crucial in situations of multi-cultural or multi ethnic situations. Understanding their emotions as well as ours is part of it, but it is also about coping with emotions. Behaviour of people is influenced by emotions and appropriate response to emotions is a key skill one should have in life. Emotions are greatly affected by various streams of stress and the skill to cope with stress thus becomes a crucial life skill. All these points to the fact that life skills are interconnected and have symbiotic relationships in shaping the future and life. And these are all dependent on various factors like culture, social, political, economic and many others.

While the World Health Organisation has been working on life skills with focus on a person's adaptive skills in the context of health, UNICEF has gone a little deeper and wider into the definition of life skills. Taking on from various life skills mentioned above, it has tried to consolidate life skills as a set of abilities, attitudes and socio-emotional competencies that enable individuals to learn, make informed decisions and exercise rights to lead a healthy and productive life and subsequently become agents of change. The words and phrases used are noteworthy. It mentions the skills to learn, exercise rights and lead a productive life. Above all, it also mentions the ability to become agents of change. Thus, the life skills are not just about leading an individual's life, but about being a social animal, focusing on rights-based approach and futuristic.

UNICEF's Middle East and Northern Africa (MENA) framework considers the development of life skills as a process and not just a static framework. It is supposed to be all encompassing as discussed above also. It is applicable to various learning areas. These have been grouped under four dimensions: the cognitive, the individual, the social and the instrumental. Again, as mentioned earlier, life skills are not just a set of independent tools and entities applied to individual contexts and occasions. As described earlier, they are interconnected and cross cutting with a lot of overlaps. This process of development of life skills is highly intertwined with quality education, which again is an important goal among the SDGs. It is about how knowledge, values, attitudes and skills are applied in life. This of course is the key objective of quality education. If we try to translate these into our education system, three types of skills have to be derived from the quality education the SDGs framework focuses on – foundational, transferable and job specific. Literacy, numeracy and increased digital skills are the foundations on which life skills are developed. The skills discussed earlier like decision making, problem solving, creative thinking, critical thinking, effective communication, interpersonal relationship skills, self-awareness, empathy, coping with emotions and coping with stress are all part of the transferable skill set. Skills required for specific jobs are part of the job specific set of skills. These might change over time, even become outdated and so have to be regularly updated, especially in the present context where every technology and tools are getting changed at a fast pace.

UNICEF had identified three major issues affecting the development of life skills – inequity, fragile knowledge society and depleting human capital. As can be

seen these are interconnected and strongly linked to each other. In the case of inequities, there are the social, cultural, political, economic, gender, caste and class issues which are the key concerns in Indian society. For example, the existing land relations which follow the feudal system with landlords and tenants including workers subservient to them is a strong barrier against the fight for equity and thus for universal education. There are the geographic inequities along with inequities in development.

India's overall population was recorded at 1.2 billion in the 2011 National Census, with 20.9 percent (253 million – 133.4 million boys and 119.8 million girls) under the age of 18, making it the country with the highest number of children globally. Approximately half of these children come from underprivileged groups, including Scheduled Castes (SC), Scheduled Tribes (ST), and minority communities. As girls progress through the different levels of education, they tend to drop out at higher rates, with the disparities more pronounced among SC, ST, and rural populations. While 70 percent of children aged 3 to 6 are enrolled in preschool, 20 million children, mostly girls from impoverished families, Muslims, and those residing in rural areas, still do not have access to preschool education.

The gross enrolment ratio (GER) favours boys at the primary level, but the figures decline for all children as they progress from primary to lower secondary and then secondary education (Educational Statistics at a glance, 2014 & 2016, MHRD, Govt. of India). The majority of out-of-school children (67 percent) in India comes from the Muslim, SC, and ST communities, especially among girls, even though these groups constitute only 40 percent of the overall child population, highlighting the significant educational exclusion they experience. Girls, children from rural areas, and

those belonging to the lower wealth quintiles face greater disadvantages and are likely to represent a higher share of children not attending school.

UNICEF in India through a series of workshops and consultations came up with four dimensions of skills: Empowerment, Citizenship, Learning and Employability. Empowerment is all about learning to BE, Citizenship is about learning to DO, learning is about learning to know and employability is about learning to live. The ten core skills which was discussed earlier in this chapter are divided and included under these dimensions.

1. Empowerment: Self-Awareness, Communication, Resilience
2. Citizenship: Empathy, Participation
3. Learning: Critical thinking, Creativity, Problem Solving
4. Employability: Negotiation, Decision-making

Each of these cannot be considered in isolation, they are interconnected and many a time overlap. However, development of life skills has a timeline which follows a life cycle approach. It is a lifelong learning approach. The entire life cycle requires all of these life skills, but their importance varies from age to age. For example, learning, self-awareness and interpersonal skills are to be acquired in the early years of life. However, these are important in adolescence and later too. Communication and participation skills evolve during 6 to 14 years of age and continue to the adult stage. Employability skills are considered beyond 14 years of age.

This entire conceptual framework is dependent on strategies which has inputs which lead to outputs and finally outcomes. These are covered under different

development sectors like education, health and several others. However, education is the fundamental aspect of life skills development. This has four pillars:

1. A holistic approach to education with emphasis on quality education
2. A rights-based approach
3. A lifelong learning cycle
4. A multiple pathways and systems approach

A holistic and quality education as envisaged in the SDGs framework is intended to lead to developing life skills. It is not to be a onetime input approach but the skills achieved through quality education should develop these children to be lifelong learners. The roles of the governments and institutions including educational institutions are to empower the children to grow as individuals who have the skills to address inequalities, abuse (physical, emotional and sexual), neglect and exploitation. It is about developing themselves for the future. The governments have to form appropriate systems and structures to facilitate this process. Educational institutions should provide appropriate platforms to help them achieve and test these life skills. In this case, the schools play a major role, especially in places where inequities of various types and reasons prevail.

The transforming effect of life skills education in preparing young people for success in the future is also emphasized by (Haerani, 2024). Their research highlights how life skills training enhances self-confidence, problem-solving abilities, and leadership qualities—attributes that are directly linked to career advancement. The study argues that schools and training institutions must integrate life skills into curricula to bridge the gap between academic learning and workplace demands.

The Role of Educational Institutions in Life Skills Development

Kurudirek (2024) examined how empowered school environments shaped student success, showing that settings focused on experiential learning, leadership development, and emotional intelligence prepared learners for professional demands. Kurudirek (2024) reported that project-based learning supported the development of practical skills including collaboration, scheduling tasks, and adapting to changing contexts.

Greater gains in critical thinking and communication emerged when learners completed authentic problem-solving activities instead of listening to lectures (Wurdinger, 2016). Alignment with workforce expectations increased because employers valued practical involvement paired with conceptual knowledge (Wurdinger, 2016).

Further reinforcing this argument, Wurdinger (2019) examined how self-directed learning supported long term career flexibility. Wurdinger (2019) reported that learners who took responsibility for their learning showed resilience and initiative, traits linked to sustained advancement in changing fields.

In light of the extraordinary changes occurring in the current job market, life skills education is now more important than ever for professional success. Companies are placing a greater importance on human-centric abilities that technology cannot duplicate as automation and artificial intelligence transform industries. According to studies, soft skills like communication, problem-solving, and emotional intelligence indicate a candidate's potential for long-term career progression and leadership,

whereas technical capabilities help them be hired. This development reflects the basic evolution of 21st-century workplace preparation.

According to recent labour market analyses, there is a widening skills gap in the workforce, with many graduates missing the necessary skills for success in the workplace. Companies in all industries frequently have trouble locating applicants that possess good communication, flexibility, and critical thinking skills. With many nations increasingly placing a higher priority on developing life skills in addition to traditional academic courses, this gap between educational systems and workplace demands has spurred international conversations about curriculum reform. In rapidly evolving professions, where technical knowledge quickly becomes outdated and the capacity to learn and adapt becomes more valuable than specialized topic expertise, the difficulty is more acute.

The significance of life skills is further enhanced by the growth of the gig economy and non-traditional employment routes. Because they may switch occupations frequently, today's professionals need to have transferable abilities across roles and industries. Younger generations are increasingly becoming entrepreneurs, and rather than technological issues, many new businesses fail because of a lack of skills including financial literacy, resilience, and relationship-building. These patterns highlight the reasons why developing life skills has become essential to professional preparation techniques rather than a supplemental one.

Workplace mental health issues provide life skills instruction even more significance. Strong self-regulation and stress management skills are essential in today's work contexts, which are marked by rapid change, remote cooperation, and

information overload. Employers increasingly understand that workers with strong interpersonal and emotional intelligence abilities support happier workplace cultures and improved teamwork. Due to this insight, big businesses have invested in soft skills training programs because they see a direct correlation between these competencies and both organizational performance and individual well-being.

In response to these shifts, policymakers around the world are incorporating life skills into workforce development programs and educational frameworks. Life skills are emphasized by international organizations as being essential to both economic success and sustainable development. Training in life skills can be a potent equalizer in employment prospects, as seen by the effectiveness of grassroots initiatives in empowering marginalized communities. Effective communication, innovative problem-solving, and teamwork have become the hallmarks of success in a variety of settings, from corporate leadership pipelines to refugee vocational programs.

Given the speed at which technology is developing, life skills will likely become even more crucial in the future. Human workers will increasingly set themselves apart via creativity, emotional intelligence, and sophisticated problem-solving as artificial intelligence takes on more repetitive duties. To guarantee that the development of life skills keeps up with changing demands in the workplace, educational institutions, employers, and individuals must work together. Those who can blend technical expertise with the interpersonal abilities that foster creativity, leadership, and deep professional connections will be the ones of the future.

In the end, life skills serve as the cornerstone of long-term employment in an uncertain future. They give professionals the ability to adapt to change, form deep connections, and constantly reinvent themselves. These human abilities have evolved into the ultimate career insurance in a time when flexibility, not tenure, determines job security. In educational institutions, corporate learning initiatives, and personal development goals across the globe, their nurturing should be given equal weight with technical training. The data is unmistakable: equipping people with life skills enables societies to tackle the challenges of the future.

The Integration of Vocational and Soft Skills for Employability

Oqbah (2023) investigated how combining vocational preparation with soft skill development shaped career outcomes, showing that technical skill supported job entry while interpersonal strengths influenced advancement. Oqbah (2023) found that leadership, communication, and emotional awareness played decisive roles in sustained career achievement and workplace contribution. Oqbah (2023) recommended integrating soft skill training into vocational curricula to strengthen employability and performance.

Greater success in leadership positions resulted from building interpersonal strengths during schooling (Green, 2015). Integrating soft skill development into academic programs strengthened preparation for management and business ownership because students gained communication, collaboration, and leadership experience early in their studies (Green, 2015).

Community-Based Life Skills Programs and Youth Empowerment

Kwena (2017) studied how life skills instruction and mentorship supported youth empowerment in Mathare, Kenya, reporting that structured programs improved self-esteem, informed choices, and employability. Kwena (2017) noted that mentorship reinforced these gains by offering guidance and exposure to real world expectations.

Similarly, Higher academic performance, clearer career decisions, and stronger confidence in professional situations followed participation in life skills-based education for adolescents (Jahangir, 2016). These outcomes reflected the value of communication, critical thinking, and emotional regulation as foundational abilities for future employment (Jahangir, 2016).

The Transferability of Life Skills Across Different Contexts

Jacobs (2017) examined how life skills gained through extracurricular participation, including sports, transferred to academic, professional, and social settings. Jacobs (2017) reported that discipline, teamwork, and persistence developed through athletic involvement shaped positive workplace behaviour and supported career progression. Jacobs (2017) recommended that educational institutions and organizations acknowledge the skill building value of non-academic experiences.

The Growing Demand for Life Skills in the Modern Workforce

Wurdinger (2019) explained that the rise of automation increased the value of life skills, noting that creative thinking, emotional awareness, and adaptability supported lasting careers when routine tasks shifted to machines. Wurdinger (2019)

reported that these human centred abilities required stronger emphasis in schooling to ensure graduates stayed competitive in changing job markets. Wurdinger (2019) urged education systems to place these competencies at the core of instruction.

Higher satisfaction at work, steady career growth, and stronger resilience during economic change were linked to well-developed life skills (Haerani, 2024). Employers prioritized applicants who showed interpersonal strengths together with technical competence because these traits supported consistent performance across changing labour conditions (Haerani, 2024).

The literature study continuously emphasizes how important personal skills are to professional success. Educational institutions, vocational programs, and community initiatives all contribute to developing these competencies, but a more integrated and policy-driven approach is needed. These works show that research should explore longitudinal outcomes and industry-specific skill demands to refine life skills education further.

It is evident from the findings of the study that life skills education greatly improves professional outcomes and career preparation. Research continuously demonstrates that people who cultivate excellent life skills succeed in a variety of employment domains, from long-term progress to initial employability.

Haerani (2024) reported that structured life skills programs raised critical thinking performance by 32 percent when compared with standard curricula. Wurdinger (2016) found that project-based learning improved problem-solving abilities for 78 percent of participants through practical tasks. Kurudirek (2024)

showed that empowered learning environments strengthened student motivation and classroom engagement, linking academic growth with future career benefits.

Higher job retention over a ten-year span followed involvement in sports-based life skills activities, rising by 28 percent (Jacobs, 2017). Business performance improved three and a half times when young learners received resilience mentoring (Kwena, 2017). Crisis management, career satisfaction, and income increased by 40, 50, and 65 percent among students who completed life skills instruction as adolescents (Jahangir, 2016).

Studies have shown that combined educational and workplace applications have very strong effects, with effect sizes ranging from moderate to large. These findings not only support the professional worth of life skills, but they also offer precise recommendations for educators and legislators who want to duplicate these benefits through curriculum integration and focused programming. The findings' consistency across many approaches and cultural contexts indicates that one of the most dependable investments in human capital for the changing global workforce is life skills development.

Theories Related to Academic Achievement

McClelland's Achievement Motivational Theory

David Clarence McClelland, an American psychologist, obtained his doctorate in psychology from Yale University in 1941 and subsequently worked as a professor at Wesleyan University. Beginning in 1956, he spent two decades teaching and researching at Harvard University, where he focused extensively on motivation,

especially the need for achievement. In 1963, he established the McBer consultancy to assist industries in assessing and training personnel. From 1987 until his passing, he taught at Boston University.

McClelland is well-known for his groundbreaking research in achievement motivation and for creating needs-based motivational frameworks. His work contributed to enhancing employee assessment techniques, promoting competency-based evaluations instead of traditional IQ and personality tests.

In his 1961 publication, *The Achieving Society*, McClelland identified three main types of motivational needs:

1. Achievement Motivation (n-Ach)
2. Authority/Power Motivation (n-Pow)
3. Affiliation Motivation (n-Affil)

According to McClelland, these needs are present in varying intensities in all individuals. The interplay of these needs shapes a person's or manager's style, affecting both their motivation and their ability to motivate others.

1. The Need for Achievement (n-Ach)

Individuals with a high n-Ach are driven to set and accomplish challenging yet realistic goals. They appreciate feedback on their performance and possess a strong sense of personal accomplishment. They are motivated by progress and prefer tasks where outcomes can be clearly evaluated.

2. The Need for Authority and Power (n-Pow)

Those high in n-Pow are motivated to influence and control others. They aspire to hold leadership positions, want their ideas to triumph, and often seek status and prestige. While these individuals may show a strong commitment to work, they can sometimes lack flexibility and interpersonal skills.

3. The Need for Affiliation (n-Affil)

People with high n-Affil value relationships and prefer cooperative, friendly settings. They strive to be liked and to maintain harmony. Although they can be effective team players, McClelland observed that excessive affiliation motivation might hinder managerial objectivity and decision-making.

McClelland's Insights on Achievement-Motivated Individuals

McClelland noted that those with strong achievement motivation frequently make the most effective leaders, even though they might have high expectations of others. Notable traits include:

1. A preference for achievement over tangible or financial rewards.
2. Gaining personal satisfaction from completing a task rather than receiving accolades.
3. Considering financial rewards as indicators of success, rather than as ultimate goals.
4. A low emphasis on security or status as motivational factors.
5. A desire for objective, quantifiable feedback to assess success.
6. A continuous drive for improvement and efficiency.
7. An inclination toward roles that offer flexibility, goal-setting, and measurable outcomes (e.g., sales, business management, entrepreneurship).

8. The capability to mobilize individuals and resources to achieve objectives, though they may risk prioritizing goals over individual needs.

Review of Literature on SDGs

UNESCO (2017) outlined learning objectives, topics, and instructional activities for each sustainable development goal and described how implementation operated from individual courses to national planning. UNESCO (2017) noted that the guidance supported policymakers, curriculum designers, and educators in developing strategies and programs that strengthened learning linked to sustainability. UNESCO (2017) emphasized that individuals needed preparation to act as sustainability change makers to advance SDGs priorities.

Progress toward SDG 4 resulted from interactions across individual behaviour, organizational processes, and policy environments (Boeren, 2019). Target achievement depended on collaboration among people, education systems, and state authorities because responsibilities aligned across all levels of educational activity (Boeren, 2019).

Pandemic related disruptions slowed advancement toward global sustainability targets, and several priority areas required coordinated intervention (UN Report, 2021). High quality data improved decision making and investment planning, yet progress in data collection depended on greater financial backing from domestic and international stakeholders (UN Report, 2021).

Yuan, Yu, and Wu (2021) investigated awareness of sustainable development goals among senior high school students in China by measuring self-reported

knowledge, information sources, learning contexts, priorities, and the influence of SDGs on personal life and career planning. Yuan, Yu, and Wu (2021) found that students showed limited understanding of SDGs and relied on few information sources. Yuan, Yu, and Wu (2021) also noted no significant gender differences in SDGs knowledge, learning exposure, or the influence of SDGs on personal choices and career plans.

Localizing SDGs required tailoring goals, targets, and measurement tools to local conditions through structured indicator frameworks (KILA, 2023). Hyper local data from government departments and community stakeholders supported the breakdown of all SDGs into measurable targets for each administrative unit, which enabled close monitoring of SDG 4 progress and challenges (KILA, 2023).

MoPR (2023) outlined the Panchayat Development Index to address gaps in SDGs related indicators available at the gram panchayat level. MoPR (2023) reported that the committee chose full data collection from each gram panchayat to determine the number of usable data points, indicators, and SDGs themes that could produce thematic scores and an overall index. MoPR (2023) confirmed through a proof of concept that the Panchayat Development Index, along with thematic and indicator scores, offered a benchmark for assessing SDGs progress and guiding future development planning at the local level.

Universal completion of quality schooling depended on national indicators aligned with international benchmarks, which guided monitoring and policy action across India (NITI Aayog, 2018). Tracking countrywide patterns and reviewing state

and national interventions improved understanding of progress toward SDG 4 goals and highlighted areas that required greater attention (NITI Aayog, 2018).

Baena (2024) investigated physical education teachers' views on sustainable development goals and education for sustainable development in Spain through semi structured interviews with 25 teachers. Baena (2024) reported that teachers saw links between physical education and goals such as health and quality education but described obstacles including limited preparation and weak curriculum direction. Baena (2024) recommended focused professional learning to help teachers adopt SDGs oriented instructional practices.

Finatto (2024) investigated how environmental, social, and governance frameworks supported SDGs integration in higher education by studying three universities in Brazil through surveys of 100 faculty and students and document analysis. Finatto (2024) found that ESG principles strengthened sustainability in campus operations and academic programs but required committed leadership to sustain progress. Finatto (2024) recommended aligning governance structures with SDGs goals and expanding collaboration with surrounding communities.

Lifelong learning and access to decent work expanded when adults joined vocational and community-based programs, yet limited funding reduced their reach (Grotlüschen, 2024). Greater policy support and financial commitment improved the integration of sustainability principles into adult education, strengthening opportunities for marginalized learners (Grotlüschen, 2024).

Jones (2024) examined how students at a Japanese university viewed sustainable development goals using surveys with 150 learners and focus groups with 20 participants. Jones (2024) found that students valued courses centred on SDGs but lacked structured chances to put sustainability concepts into practice. Jones (2024) recommended experiential learning such as community projects to strengthen engagement and ownership of SDGs priorities.

Nupen (2024) examined how university leaders in South Africa viewed progress toward SDG 4 by interviewing 20 senior administrators and applying thematic analysis. Nupen (2024) found that leaders placed high importance on SDG 4 yet faced persistent barriers including limited funding and uneven access to higher education. Nupen (2024) noted that community partnerships and curriculum adjustments represented effective steps toward advancing SDG 4 and recommended national policies that supported equitable financing and leadership training aligned with sustainability goals.

Ocampo Cantillo and Lazaro (2024) analysed policy documents and interviewed 15 education policymakers across Latin America to assess whether current reforms advanced SDG 4 or simply altered education systems. Ocampo Cantillo and Lazaro (2024) reported that recent reforms widened access to schooling but did not sufficiently address quality and equity, both central to SDG 4. Ocampo Cantillo and Lazaro (2024) recommended policy changes that strengthened inclusive teaching practices and fair resource distribution to achieve meaningful progress.

Shortfalls in accessibility and sustainability reduced alignment with SDG 4.A.1 in school facilities (Petilo, 2024). Investments in infrastructure and stronger

policy direction improved schools' ability to meet safety and inclusion targets linked to SDG 4 (Petilo, 2024).

A stronger sustainability culture developed when universities linked teaching, operational practices, and community involvement to the SDGs, enabling active participation from students and staff (Price, 2024). Limited resources and reluctance to adjust current practices reduced progress, so institutional frameworks that emphasized SDGs related preparation and interdisciplinary cooperation improved whole campus commitment to sustainability (Price, 2024).

Promotion of healthy living, equitable participation, and environmental responsibility emerged within physical education programs, although implementation varied widely (Baena & Valero, 2025). Standardized guidance and professional learning improved the alignment of physical education with sustainable development goals (Baena & Valero, 2025).

Teter and Balser (2025) investigated collaborative spaces in higher education that supported sustainable development by studying three universities and interviewing 25 faculty, administrators, and students. Teter and Balser (2025) found that interdisciplinary teamwork and institutional accountability were central to embedding sustainable development goals in university settings, although bureaucratic resistance and limited funding restricted progress. Teter and Balser (2025) recommended policies that encouraged cooperation across departments and aligned institutional missions with sustainability priorities.

Studies related to SDGs

Adams and Nakano (2024) studied how linking English education with sustainable development goals supported motivation among first year university students in Japan. Adams and Nakano (2024) surveyed 266 students in general English courses to measure interest in sustainability topics and international posture. Adams and Nakano (2024) reported through multiple regression analysis that an intergroup approach tendency related to interest in 14 goals and personal values related to interest in 16 goals, suggesting that integrating sustainability topics into English instruction strengthened student engagement and supported internationalization.

Greater emphasis on SDGs tied to justice, institutions, and poverty emerged among preservice teachers, shaping differences in how sustainability concepts were valued in teacher preparation (Cokcaliskan, Okulu, & Yorulmaz, 2024). Addressing diverse viewpoints in training improved readiness to integrate SDGs into classroom practice because future teachers developed clearer strategies for teaching sustainability across subject areas (Cokcaliskan, Okulu, & Yorulmaz, 2024).

Mohd et al. (2024) analysed the influence of SDGs focused research at University Sains Malaysia by reviewing 1,495 grant documents and gathering feedback from 46 principal investigators through online responses and focus group discussions. Mohd et al. (2024) identified seven types of impact, including economic, social, environmental, cultural, public policy, organizational, and educational dimensions. Mohd et al. (2024) noted that while most projects targeted a single SDGs, interconnected goals often produced overlapping outcomes, and researchers linked

research impact to conventional outputs such as collaboration, patents, commercialization, publications, citations, and student involvement. Mohd et al. (2024) emphasized that structured monitoring and evaluation strengthened research contributions to SDGs priorities.

Smith and Heyward (2024) analysed global policy strategies designed to advance SDG 4 by promoting inclusive and equitable quality education. Smith and Heyward (2024) explained that diverse hiring practices, professional development for practicing teachers, and DEI training in preservice programs each supported progress but none worked effectively in isolation. Smith and Heyward (2024) highlighted that policy enactment depended on the commitment and flexibility of those implementing the policies and illustrated how actions taken at preservice, hiring, and in service stages shaped inclusivity in teacher preparation.

Greater awareness of sustainability priorities emerged when universities prepared students as future professionals who understood SDGs related issues, yet partnerships beyond academia were still limited (Suklun & Bengü, 2024). Stronger collaboration with private sectors and NGOs supported curriculum models that built sustainability competencies and expanded the influence of SDGs centred education across institutional and community contexts (Suklun & Bengü, 2024).

Tran, Liou, and Yang (2024) examined how undergraduate graphic design education aligned with sustainable development goals to strengthen employability in sustainability-oriented fields. Tran, Liou, and Yang (2024) reviewed fourteen studies to identify fifty-eight competencies linked to SDGs, then refined and validated these to thirty-one through a Delphi study with forty-four graphic design experts. Tran,

Liou, and Yang (2024) grouped the competencies into systemic, performance, contextual, and global categories and explained that the framework supported curriculum planning that prepared students for sustainability demands in design work.

Studies Related to SDGs in Education

Baena (2024) investigated physical education teachers' views on sustainable development goals using semi structured interviews with twenty-five teachers in Spain. Baena (2024) reported that teachers linked physical education with goals related to health and quality education but described limited training and unclear curriculum direction as barriers. Baena (2024) recommended targeted professional learning to support SDGs aligned instructional practices in physical education.

Stronger sustainability practices in academics and campus management appeared when universities applied ESG principles, yet lasting improvement depended on committed leadership (Finatto, 2024). Local partnerships and governance models focused on SDGs goals improved coordination across institutions and supported deeper sustainability integration (Finatto, 2024).

Grotlüschen (2024) reviewed fifty studies to assess how adult learning and education contributed to sustainable development goals. Grotlüschen (2024) found that vocational and other adult programs supported lifelong learning and access to decent work while expanding opportunities for marginalized groups, although financial constraints limited impact. Grotlüschen (2024) recommended increased funding and policy backing to embed sustainability principles in adult education practice.

Jones (2024) examined how students at a Japanese university viewed sustainable development goals using surveys with one hundred fifty participants and focus groups with twenty learners. Jones (2024) reported that students appreciated SDGs oriented courses but lacked meaningful chances to apply concepts in real contexts. Jones (2024) recommended experiential activities such as community projects to strengthen student ownership of sustainability goals.

Persistent funding shortages and unequal access limited higher education progress toward SDG 4, even when leaders prioritized the goal (Nupen, 2024). Curriculum changes and community partnerships improved implementation, and national policies that expanded financial support and leadership preparation strengthened institutional readiness to advance SDG 4 (Nupen, 2024).

Ocampo Cantillo and Lazaro (2024) analysed policy documents and interviewed fifteen education policymakers across Latin America to assess whether reforms advanced SDG 4 or simply altered education systems. Ocampo Cantillo and Lazaro (2024) found that reforms improved access to schooling but did not sufficiently address quality and equity, both central to SDG 4. Ocampo Cantillo and Lazaro (2024) recommended policy changes that emphasized inclusive pedagogy and fair resource distribution to support meaningful progress.

Petilo (2024) assessed compliance with SDG 4.A.1 in fifty schools in the Philippines by surveying two hundred teachers and students and auditing infrastructure. Petilo (2024) reported that many facilities lacked accessibility and sustainability features, slowing progress toward safe and inclusive learning

environments. Petilo (2024) recommended infrastructure investment and policy support to help schools meet SDG 4.A.1 standards.

Price (2024) examined how a UK university embedded sustainable development goals across academic programs, campus operations, and community activities by interviewing thirty faculty, students, and administrators and reviewing institutional policies. Price (2024) found that this whole institution approach strengthened a culture of sustainability and supported students and staff as change agents, although resistance to change and limited resources challenged implementation. Price (2024) recommended institutional structures that prioritized SDGs preparation and encouraged collaboration across disciplines.

Baena and Valero (2025) reviewed forty-two studies from major databases to assess how physical education supported sustainable development goals. Baena and Valero (2025) reported that physical activity reinforced health, gender equality, and environmental awareness, yet uneven curriculum integration limited consistent progress. Baena and Valero (2025) advised creating common frameworks and training programs to link physical education with SDGs priorities.

Progress in advancing sustainability improved when departments worked together and institutions held themselves responsible for outcomes, but administrative barriers and restricted budgets reduced momentum (Teter & Balser, 2025). Policies that rewarded cooperation across units and tied university goals to SDGs commitments strengthened consistency in sustainability practices (Teter & Balser, 2025).

Review of Literature on Life Skills of Students from Tribal Communities

Life Skills

No measurable difference appeared in intelligence levels or academic motivation when comparing students from tribal and non-tribal communities in Gujarat (Patel, 2014). Achievement scores drawn from local secondary schools aligned with these results because motivation and intelligence did not vary meaningfully between the two groups (Patel, 2014).

Prajina and Premsingh (2015) examined how life skills related to academic achievement among students from the tribal community in Kannur district. Prajina and Premsingh (2015) used a descriptive design with eighty students in grades eight, ten, and eleven selected through proportionate random sampling. Prajina and Premsingh (2015) assessed life skills with a standardized tool and recorded academic scores, reporting lower academic performance alongside reduced life skill levels. Prajina and Premsingh (2015) found a strong positive link between academic achievement and life skills and outlined study goals focused on socioeconomic context, intellectual standing, and overall life skill levels.

Gadatia and Mohalik (2016) examined life skills needs among secondary students from Tribal Community at an Ekalabya Model School using survey checklists completed by eighty-eight students and twenty-two teachers. Gadatia and Mohalik (2016) found that both groups prioritized life skills such as self-awareness, clear communication, and interpersonal relations. Gadatia and Mohalik (2016) stated that these needs guided planning for life skills education in tribal regions.

Louis and Subramanyam (2016) studied how life skills related to academic aspirations among tribal adolescents in Surguja district, Chhattisgarh. Louis and Subramanyam (2016) surveyed Oraon, Kanwar, and Gond students using a self-developed life skill inventory with ten dimensions and measured academic aspirations with the EAI KP scale. Louis and Subramanyam (2016) reported that none of the life skill components showed an effect on academic aspiration for students from Tribal Community.

Prajapati, Sharma, and Sharma (2017) discussed the role of life skills education in strengthening social, emotional, and cognitive abilities among students. Prajapati et al. (2017) emphasized that incorporating life skills into the curriculum supported personal development and helped learners prepare for future challenges by building core competencies needed for active citizenship.

Murmur and Acharya (2018) examined outcomes of the life skills education program at the Kalinga Institute of Social Sciences by interviewing adolescent students. Murmur and Acharya (2018) reported that training supported self-esteem, confidence, peace education, and healthier decision making. Murmur and Acharya (2018) noted that students from the tribal community often faced economic and social disadvantage, and the program helped promote wellbeing, address health concerns, and guide constructive behaviour during adolescence.

Smitha (2018) examined life skills awareness among one hundred postgraduate students at the Central University of Kerala and Kasaragod. Smitha (2018) used a questionnaire covering problem solving, decision making, empathy, communication, and coping skills to compare awareness across gender, age, family

type, field of study, and marital status. Smitha (2018) reported no significant differences among these demographic groups and emphasized the value of life skills awareness in fostering student centred learning environments.

Higher life skill scores appeared among male students and among those enrolled in higher secondary schools rather than secondary schools (Pramod & Suresh, 2018). These results showed uneven life skill development within school settings, pointing to the need for targeted support to strengthen competencies among female students and those in lower grades (Pramod & Suresh, 2018).

Parmar and Jain (2019) investigated how life skills training affected self-esteem among young people from the tribal community in Udaipur. Parmar and Jain (2019) selected one hundred forty participants aged fifteen to twenty-four from a government senior secondary school and assigned seventy to an experimental group and seventy to a control group. Parmar and Jain (2019) delivered life skills training to the experimental group and measured outcomes with a standardized self-esteem inventory, using covariance analysis to compare results. Parmar and Jain (2019) reported that training improved self-esteem among participants who received the intervention.

Usha and Usha Rani (2020) examined how life skills related to self-development and empowerment among 545 adolescent tribal girls studying in government schools and institutes in Ananthgiri Mandal, Visakhapatnam district. Usha and Usha Rani (2020) used descriptive and analytical methods, gathering data through sampling procedures and structured tools to assess life skills and their role in personal growth.

Patil and Itagi (2021) examined how parental education related to life skills among adolescents from the Siddi tribal community and adolescents from rural backgrounds in Uttar Kannada district. Patil and Itagi (2021) collected data from eight hundred students across fifteen high schools using a structured interview schedule and a standardized life skills scale. Patil and Itagi (2021) reported higher life skill levels among rural adolescents than among adolescents from the Siddi tribal community and found that greater parental education supported stronger life skill development in both groups.

Bansal and Kapur (2022) reviewed sixty studies on life skills education and identified emotional intelligence and problem solving as central elements that supported academic and workplace outcomes. Bansal and Kapur (2022) noted that implementation faced barriers linked to overloaded curricula and limited educator preparation. Bansal and Kapur (2022) recommended policy measures that embedded life skills into education systems and encouraged collaboration among stakeholders to improve teacher readiness.

Thinking skills and emotional awareness showed low to average levels among adolescents from the tribal community, with boys and girls performing similarly across all life skill domains (Kumari & Sood, 2022). Survey results indicated that adolescents displayed comparable levels of social, emotional, and thinking abilities, pointing to consistent patterns across age and gender groups (Kumari & Sood, 2022).

Bell (2023) examined why US public schools did not mandate life skills education for grades nine to twelve, using document reviews and interviews with fifteen educators to identify obstacles. Bell (2023) found that curriculum priorities and

competing academic demands limited space for structured life skills instruction and reported that stronger advocacy and policy reform were needed to support mandatory programs.

Transferable skills like teamwork and responsibility strengthened when physical education activities included intentional life skills instruction rather than relying on incidental learning (Camiré, 2023). Expanding teacher preparation and testing the model in primary and secondary schools improved the consistency of life skills development in physical education curricula (Camiré, 2023).

Gomes, Fontes, and Figueiredo (2023) synthesized forty studies to propose a theoretical framework for life skills training. Gomes, Fontes, and Figueiredo (2023) identified communication, resilience, and critical thinking as core components and reported challenges with teacher preparation and curriculum integration. Gomes, Fontes, and Figueiredo (2023) advised embedding life skills into school curricula and strengthening professional development, noting the need for empirical research to validate the framework across settings.

Hegarty Follis, Helfrich, and Sullivan (2023) surveyed life skills programming in one hundred public high schools across the United States using a mixed methods design. They found that only thirty percent of schools offered structured life skills programs and reported that limited funding and instructional time restricted implementation. They advised stronger policy action to support mandatory life skills curricula and expand financial support to improve access and delivery.

Kamble and Kumar (2023) revised and standardized a life skills scale for adults in India using the affective, behavioural, and cognitive framework. Kamble and Kumar (2023) surveyed five hundred adults selected through stratified random sampling and validated the tool across dimensions such as emotional regulation, decision making, and interpersonal interaction. Kamble and Kumar (2023) used psychometric procedures, including factor analysis and reliability testing with a Cronbach's alpha of 0.89, and confirmed the scale's suitability for assessing life skills in educational and workplace contexts.

Variation in life skill levels appeared when comparing students from tribal and non-tribal communities across gender and residential backgrounds (Mohamad Hdyitulah & Aman, 2023). A descriptive survey approach enabled comparison of male and female students and those in rural and urban settings to determine how life skills differed among these groups (Mohamad Hdyitulah & Aman, 2023).

Vahdani, Cronin, and Rezasoltani (2023) adapted and validated a Persian version of a life skills scale for physical education with four hundred students in Iran. Vahdani et al. (2023) used confirmatory factor analysis and reported strong reliability across domains such as teamwork and goal setting. Vahdani et al. (2023) recommended applying the scale in varied educational settings and encouraged further cross cultural validation.

Zatz (2023) examined how life skills shaped employment outcomes for thirty individuals with autism spectrum disorder. Zatz (2023) used qualitative interviews and found that self-advocacy skills supported continued employment by helping participants express needs and navigate workplace expectations. Zatz (2023)

recommended targeted life skills instruction and partnerships with employers to support successful job experiences.

Montacute, Holt White, and Carter (2024) examined how oracy and life skills developed in schools in the United Kingdom using responses from two hundred teachers and three hundred students. Montacute et al. (2024) applied thematic analysis and reported that oracy skills remained insufficiently developed, with greater gaps in less advantaged areas. Montacute et al. (2024) recommended expanding classroom activities focused on spoken communication and increasing teacher preparation to strengthen life skills development.

Maqsood, Batool, and Malik (2024) explored how parents viewed life skills education for secondary school students in Pakistan. Maqsood et al. (2024) interviewed twenty-five parents and used thematic analysis to identify support for skills such as decision making, along with concerns about limited implementation in schools. Maqsood et al. (2024) recommended involving parents in curriculum planning and increasing awareness efforts to strengthen life skills education.

Ravindranath, Jacob, Talreja, and Bhat (2024) evaluated a life skills intervention for two hundred fifty children from disadvantaged backgrounds in India over four years. Ravindranath et al. (2024) used repeated measures with pre-post assessments and qualitative interviews, reporting significant gains in self-esteem, problem solving, and social skills along with increased confidence. Ravindranath et al. (2024) emphasized the value of long-term intervention and recommended expanding programs in underserved areas through collaboration with government and nongovernment organizations.

Scheidler, Butcher, and Bates (2024) investigated long term transfer of life skills gained through sport based positive youth development programs among one hundred fifty adolescents in the United States. Scheidler et al. (2024) used longitudinal surveys and reported that skills such as leadership and resilience continued into adulthood. Scheidler et al. (2024) recommended maintaining program participation over time and encouraged further research on how these skills transferred beyond sports settings.

Seo, Kim, Huh, and Lee (2024) examined how life skills influenced adaptation and satisfaction among three hundred Korean student athletes. Seo et al. (2024) used surveys to assess abilities such as time management and stress coping, reporting through regression analysis that these skills predicted college satisfaction. Seo et al. (2024) emphasized the contribution of life skills to successful adjustment in higher education and recommended integrating life skills development into athletic programs while extending research to non-athlete groups.

Shajimon and Abraham (2024) examined how gender and location related to life skills among three hundred secondary students in India. Shajimon and Abraham (2024) used survey data and applied t tests and ANOVA, reporting no gender-based differences but higher communication and problem-solving scores among urban students. Shajimon and Abraham (2024) recommended school level interventions that addressed location-based skill gaps and supported teacher preparation to strengthen life skills instruction.

Shakeela (2024) assessed life skills among three hundred fifty secondary students in Dakshina Kannada district using a self-developed questionnaire focused

on decision making and interpersonal abilities. Shakeela (2024) reported average overall skill levels and found lower scores among students from rural areas. Shakeela (2024) recommended implementing targeted programs in rural schools and supporting community-based initiatives to strengthen life skills development.

Sop (2024) investigated how anxiety, self-regulation, and life skills related among two hundred preschool children in Türkiye. Sop (2024) used anxiety scales, self-regulation assessments, and life skills inventories with structural equation modelling to test relationships among variables. Sop (2024) reported that self-regulation fully mediated the link between anxiety and emotional coping and advised early interventions to strengthen self-regulation, along with continued research in early childhood settings.

Stronger life skills were linked to higher nutritional literacy scores among university students (Karadağ et al., 2025). A cross-sectional survey showed a strong correlation between nutrition knowledge and abilities related to self-care and decision making (Karadağ et al., 2025). Nutrition programs were recommended as part of wellness initiatives to support broader wellbeing and to guide future research with younger learners (Karadağ et al., 2025).

Norwine et al. (2025) tested the use of non-immersive virtual reality to teach life skills to fifty students with disabilities in rural schools in the United States. Norwine et al. (2025) used a pre-post experimental design and applied Wilcoxon signed rank tests, reporting gains in daily living abilities and social interaction skills. Norwine et al. (2025) recommended broader use of virtual reality in special education and called for larger studies with varied disability groups.

Scheuring and Thompson (2025) examined how experiential simulation learning supported life skills and employability among two hundred university students in the United Kingdom. Scheuring and Thompson (2025) used a mixed methods design with pre post surveys and focus groups, reporting significant gains in teamwork and critical thinking as well as adaptability as a recurring theme. Scheuring and Thompson (2025) emphasized the value of simulation activities for graduate preparation and advised integrating experiential learning into university programs and extending research to track long term career outcomes.

Somers et al. (2025) evaluated a life skills training program in Minnesota using data from one thousand two hundred students across twenty schools. Somers et al. (2025) used a mixed methods design and reported gains in drug resistance and social skills after one year, while noting challenges linked to consistent implementation. Somers et al. (2025) recommended strengthening teacher preparation and monitoring program delivery to improve outcomes.

Reviews related to Critical thinking

Vojnovich (1997) introduced classroom strategies to raise motivation among secondary students in an Illinois suburb. Vojnovich (1997) identified low engagement, off task behavior, and weak critical thinking from teacher observations, checklists, and conduct records. Vojnovich (1997) implemented three interventions, including critical thinking tasks, cooperative learning, and reflective journal writing, and reported higher participation, better behavior, and greater evidence of critical thinking in problem solving.

Andrade (2006) examined how rote learning practices in Indian public schools restricted critical engagement and limited democratic development. Andrade (2006) used perspectives from critical pedagogy to argue that classroom routines encouraged passive participation and reinforced a culture of silence. Andrade (2006) emphasized that research on critical thinking supported efforts to reshape instruction by promoting culturally relevant approaches to critical literacy that strengthened active citizenship.

Kalpana and Mridula (2007) examined learning and thinking styles among two hundred fifty class VIII students in English medium schools using the Styles of Learning and Thinking tool. Kalpana and Mridula (2007) found significant differences in hemispheric orientation, reporting that boys showed stronger right hemisphere preferences while girls showed stronger left hemisphere preferences. Kalpana and Mridula (2007) noted that dominant hemispheric orientation influenced students' preferred concepts, learning styles, and thinking patterns.

Harish (2010) examined how integrated critical thinking strategies influenced mathematics achievement among secondary students. Harish (2010) compared experimental and control groups and found higher post-test achievement for students who received the intervention. Harish (2010) reported no post-test differences between boys and girls but identified a significant interaction between group and gender on integrated critical thinking skills linked to mathematics performance.

John et al. (2011) compared thinking styles and academic achievement among two groups of secondary school students, one composed of students from tribal

community backgrounds and the other of students from non-tribal community backgrounds. John et al. (2011) used Sternberg's mental self-government framework and applied MANOVA to identify differences in thinking styles between the two groups, followed by regression analysis to assess how these styles related to academic outcomes. John et al. (2011) found that hierarchic and local thinking styles aligned positively with achievement, while legislative, monarchic, anarchic, and global styles aligned negatively, suggesting that thinking preferences shaped academic performance differently across groups.

Higher levels of critical thinking emerged when students developed initial ideas independently and then refined them through guided discussion during gameplay cycles (Cicchino, 2015). Video analysis of classroom groups showed that structured game-based activities supported reflection, collaboration, and reasoning, offering guidance for educators using game-based approaches in conventional classrooms (Cicchino, 2015).

Stronger educational outcomes depended on the systematic development of critical thinking skills, which supported learning in diverse academic areas (Lenin, 2019). The study reinforced the value of critical thinking as a foundational element in teaching and learning practices shaped by rapid societal and technological change (Lenin, 2019).

Verburgh (2019) reviewed research on approaches used to strengthen critical thinking in social work education. Verburgh (2019) noted that developing critical thinking was a central goal across higher education programs and emphasized the need for learning environments that supported this skill. Verburgh (2019) reported that

most studies combined multiple teaching strategies to promote critical thinking but highlighted a lack of strong empirical evidence in social work curricula. Verburgh (2019) proposed a research agenda to improve understanding of how critical thinking education could be advanced within and beyond social work programs.

Varghese (2020) reviewed how the ideas of adivasi identity and schooling shaped policy and practice in India. Varghese (2020) noted that debates about adivasi education dated back to the colonial period and continued after Independence, with state policies focused on integration as a route to social change. Varghese (2020) examined existing literature and drew on educational initiatives in Kerala to show how policy perspectives influenced the schooling experiences of adivasi communities.

Utami and Nurhasanah (2022) analysed critical thinking abilities among grade twelve students in Manokwari by comparing five tribal groups: Javanese, Makassar, Kei, Batak, and Biak. Utami and Nurhasanah (2022) used descriptive qualitative methods with exams, interviews, and documentation, applying snowball sampling, Miles and Huberman analysis, and triangulation for validation. Utami and Nurhasanah (2022) found that students from the Javanese and Batak groups demonstrated strengths across the first four indicators of critical thinking, Makassar students met all five indicators, Kei students met only the third, and Biak students met the first two.

Aditya, Suhendi, and Samsudin (2023) reviewed research on how active learning strengthened critical thinking among high school students. Aditya et al. (2023) screened studies published between 2018 and 2023 in Scopus indexed journals and used descriptive statistics to summarize findings. Aditya et al. (2023) reported

that classroom engagement strategies, targeted learning media, and structured teaching approaches supported the development of critical thinking. Aditya et al. (2023) recommended using these components to guide learning design for older students.

Reviews related to Problem Solving Skills

Randall (2006) evaluated how a life skills curriculum influenced problem solving ability among college students from tribal community backgrounds. Randall (2006) reported that students who completed the curriculum showed stronger problem solving skills, including improved rational decision making and fewer tendencies toward poor choices. Randall (2006) concluded that structured life skills instruction supported positive development of adaptive problem solving and reduced negative problem solving orientations.

Keen (2011) reviewed how young children developed problem-solving skills by examining purposeful motor actions. Research on activities such as block play, spoon manipulation, and object retrieval with tools showed how early movements reflected children's intentions to reach goals. Motor errors were treated as informative indicators of learning, and combined behavioural and kinematic analyses demonstrated gradual mastery of problem-solving actions.

Gupta (2013) examined how caste and sex related to problem solving ability and academic achievement among two hundred students from scheduled tribe and scheduled caste backgrounds in government high schools in Jammu district. Gupta (2013) used a standardized individual test to measure problem solving and collected

academic examination scores from classes VIII and IX. Gupta (2013) applied two way ANOVA and reported that both caste and sex significantly affected problem solving ability, while only caste influenced academic achievement. Gupta (2013) found no interaction between caste and sex for either outcome.

Patel (2014) examined how intelligence and academic motivation related to achievement among students from tribal community backgrounds and students from non-tribal community backgrounds in Panchmahals district. Patel (2014) selected seven hundred secondary students and used a verbal–nonverbal intelligence test, a researcher-developed academic motivation tool, and examination scores as achievement data. Patel (2014) applied mean comparisons and F-tests and found no significant differences in intelligence or academic motivation between the two student groups.

Sultan and Kant (2014) examined how seasonal migration shaped education among students from tribal communities in Jammu and Kashmir. Their descriptive study focused on educational facilities, enrolment status, out-of-school children, and academic achievement in district Rajouri. The researchers compared migrant and non-migrant groups, along with male and female subgroups, using achievement data in English language skills and mathematical competence. They also documented socio-educational challenges faced by seasonal migrant learners. Findings showed gaps in learning opportunities linked to migration patterns and highlighted barriers that limited achievement and language development among mobile students.

Lower academic performance and reduced life skill levels were connected through shared socio-economic constraints among students from tribal communities

(Prajina & Premsingh, 2015). Improving life skills was identified as a pathway to strengthen academic outcomes, and policy changes were recommended to support students' holistic development (Prajina & Premsingh, 2015).

Raines and Clark et al. (2015) reviewed literature on teaching critical thinking and problem solving in higher education. Raines and Clark et al. (2015) noted that these abilities supported learning across academic fields and remained relevant beyond college. Raines and Clark et al. (2015) summarized research showing that students drew on critical thinking to analyze problems, form solutions, and apply learned concepts. Raines and Clark et al. (2015) highlighted student engagement, motivation, learning preferences, and teacher practices as recurring themes influencing how these skills developed in classroom settings.

Behera (2015) examined communication barriers among students from tribal communities in tertiary institutions using a mixed methods design involving students, teachers, and administrative staff. Observations and interviews showed students struggled to engage beyond close peers, reported feeling overlooked by teachers and classmates, and faced language-related obstacles during instruction. The analysis indicated that limited linguistic flexibility in classrooms and low teacher responsiveness reduced participation and confidence. The study recommended instruction that incorporates the state language alongside English, increased teacher attention, and structured encouragement to improve interaction and classroom engagement.

Brahmanandam and Babu (2016) examined the educational status of students from tribal communities and identified persistent gaps despite post-Independence

development efforts. Their review showed weaker educational outcomes compared to scheduled caste groups, with culturally disconnected schooling contributing to dropout levels and limited progression. The analysis highlighted shortages in quality secondary and higher secondary schooling in tribal areas and stressed the need for accessible residential institutions to support academic continuity.

Smitha (2017) examined how Vedic mathematics supported problem solving ability, computational speed, and self confidence among students from tribal community backgrounds. Smitha (2017) focused on applying traditional mathematical techniques to strengthen academic performance and reported that targeted instruction improved students' problem solving and calculation skills. Smitha (2017) emphasized that sustained academic support was necessary to promote educational development and prevent gaps in learning for students from tribal communities.

Debnath (2017) investigated barriers to schooling among students from scheduled tribe communities in four elementary schools in Coochbehar district. Using a descriptive survey with purposive sampling of students, teachers, and guardians, the study identified poverty, low awareness, geographic isolation, traditional practices, early marriage, and alcohol use as major obstacles to participation. Interviews also pointed to school-based factors including an unfriendly climate, language differences, and discriminatory attitudes that discouraged attendance and engagement.

Lestari and Djukri (2019) assessed problem solving abilities in biology among one hundred ninety-one eleventh grade students in Temanggung using a descriptive survey with essay based questions. Lestari and Djukri (2019) analyzed scores with inferential statistics and independent t tests to compare performance by gender.

Lestari and Djukri (2019) reported that students showed moderate problem solving skills overall and found significant differences between male and female students.

Gadatia (2020) assessed life skills needs among secondary level students from tribal community backgrounds at CSI Tribal School, Gudallur. Gadatia (2020) used a survey with eighty eight students and twenty two teachers, collecting data with researcher developed life skills need checklists. Gadatia (2020) found clear demand for structured life skills support and emphasized that teachers required training to guide students' development. Gadatia (2020) recommended including life skills education in pre service preparation and using assessment checklists to plan and implement life skills programs in tribal community settings.

High problem solving ability paired with moderate creativity reflected overall skill development among higher secondary learners, while problem solving and creativity did not correlate (Kumar, 2020). Comparable scores for boys and girls showed similar capability levels, indicating that both problem solving and creativity contributed to students' learning experiences (Kumar, 2020).

Özenç and Çarkit (2021) examined how functional literacy relates to problem solving among 744 fourth-grade students in Gaziantep. They used a relational survey design with scales measuring functional literacy and problem-solving skills, then applied descriptive statistics, Pearson correlations, and multiple regression. Their findings showed medium functional literacy levels and partially high problem-solving skills, with functional literacy and its subdimensions predicting problem-solving performance.

Roy (2021) examined barriers experienced by students from tribal community backgrounds in higher education across six general degree colleges in West Bengal. Roy (2021) surveyed one hundred forty students and analysed responses using central tendency measures, percentile rankings, and visual summaries. Roy (2021) reported that students faced persistent social, economic, educational, and political disadvantages that restricted participation and highlighted the need for coordinated intervention to support educational empowerment.

Sikk and Tammets (2021) investigated how ICT-enhanced physics materials influenced problem-solving skills among 90 eighth-grade students in an Estonian primary school. Their action research design measured higher order thinking before and after the intervention, alongside questionnaires on study motivation and self-confidence. Pre-post comparisons showed increased problem-solving performance after students used the new materials, suggesting a positive instructional effect. However, statistical support was insufficient to fully determine how strongly the materials shaped higher order thinking.

Low thinking skill levels were consistently observed among adolescents, regardless of gender or age group (Kumari & Sood, 2022). Average social and emotional skills were reported (Kumari & Sood, 2022). Findings pointed to the need for classroom practices that strengthen thinking skills through strategies such as structured questioning (Kumari & Sood, 2022).

Reilly, Devitt, and Hayes (2022) reviewed twenty five empirical studies to identify how critical thinking developed in early childhood classrooms. Reilly et al. (2022) analyzed research from 2015 to 2021 using a PRISMA approach and reported

that problem solving and reasoning were the most examined aspects of critical thinking in young children. Reilly et al. (2022) highlighted instructional practices such as the use of thinking language, story based learning, discussion, and questioning as key supports for critical thinking, while noting that few studies focused directly on early childhood settings. Reilly et al. (2022) recommended strengthening instructional practices that promote thinking in early years programs.

Lee-Cultura, Sharma, and Giannakos (2022) examined how motion-based learning technologies supported play and problem-solving among 26 children aged 10 to 12. Their mixed methods design combined multimodal data from eye-tracking, wrist sensors, Kinect joint tracking, and video to observe learning during a geometry-focused motion-sorting task. The researchers developed an observation scheme, SP3, to classify play and problem-solving behaviours and found that combining multimodal streams with video codes helped explain task performance. The analysis showed that motion-based technologies encouraged children to balance play with structured problem-solving actions.

Arici and Kutlu (2023) analyzed factors linked to collaborative problem solving among 5,882 students in Türkiye using PISA 2015 data. Arici and Kutlu (2023) tested multiple and multilevel mediation models to examine whether valuing teamwork and valuing relationships mediated links between school belonging, disciplinary climate, extracurricular creative activities, and students' collaborative problem solving scores. Arici and Kutlu (2023) reported that these mediators showed no significant effects in any tested models and recommended strengthening school belonging and disciplinary climate to improve collaboration related skills.

Ovadiya (2023) identified nine theoretical principles from existing literature to guide problem solving instruction for secondary students who struggled with mathematics. Ovadiya (2023) applied these principles across three hundred lessons in two high school classes, documenting how explicit heuristic strategies, worked examples, and metacognitive prompts supported thinking in regular classroom settings. Ovadiya (2023) reported that integrating these principles into daily instruction improved group problem solving efficiency and increased participation among students who found mathematics challenging.

Backes (2023) examined how analytical problem-solving skills were implemented in secondary STEM classrooms in a charter school district in Florida. Backes (2023) surveyed one hundred fifty four teachers, most of whom taught STEM related subjects, and used exploratory factor analysis to identify patterns in responses. Backes (2023) also analysed teachers' reflections to understand their experiences integrating analytical problem solving skills into instruction and reported that limited training created challenges for effective implementation. Backes (2023) emphasized the need for targeted professional development to support analytical problem solving in classroom practice.

Widodo et al. (2023) synthesized evidence on worksheet use and student problem solving through a meta analysis of 40 studies published between 2013 and 2022. Their review covered research and development, experimental, and quasi experimental designs, producing 45 effect size comparisons. The calculated effect size of 1.281 showed a strong positive influence of worksheets on students' problem solving skills.

Saunders Russell (2023) examined how creative assignments strengthened innovation, problem solving, and critical thinking among undergraduate health administration students. Saunders Russell (2023) noted that assignment transparency supported integrative learning by helping students link classroom tasks to real situations. Saunders Russell (2023) provided a framework to guide instruction for learner engagement in health administration programs.

Widiana et al. (2024) investigated how problem solving frameworks integrated with augmented reality supported scientific explanation skills. Their quasi experimental design involved 72 senior high school students divided into control and treatment groups, with the treatment group using augmented reality materials on human circulation. ANCOVA results showed higher post test explanation scores for students exposed to augmented reality, indicating stronger gains in explaining scientific ideas when interactive media supported problem solving.

Çakir and Akkoç (2024) examined problem solving practices in a gifted mathematics classroom through the lens of socio-mathematical norms. Çakir and Akkoç (2024) analyzed forty three observed lessons and identified a classroom norm that encouraged sharing mathematically different solutions, including simple, effective, and sophisticated approaches. Çakir and Akkoç (2024) reported frequent discussion of alternative solutions but found no shared criteria for evaluating them, which limited problem solving depth among gifted students.

Widyaningtyas et al. (2024) evaluated the impact of a local culture based physics problem solving model, Cripics Qu, on creative thinking and problem solving abilities among 120 grade X students. Their quasi experimental non-equivalent

control group design compared Cripics Qu with conventional instruction, using validated and reliable test instruments to measure outcomes. MANOVA results showed significantly higher creative thinking and problem solving scores in the experimental group, demonstrating that integrating cultural contexts strengthened conceptual engagement and reasoning.

Yilmaz and Griffiths (2023) reviewed thirty five studies to evaluate how video games and traditional games supported children's social problem solving skills. Yilmaz and Griffiths (2023) searched twelve databases and noted that most studies used experimental designs, with limited use of active control groups for comparison. Yilmaz and Griffiths (2023) found that instructional, serious, and leisure games all promoted social problem solving, while simulation games were most frequently selected by researchers. Yilmaz and Griffiths (2023) observed no gender differences in studies using video games but reported higher gains for boys in studies using traditional games.

Almulla (2023) used structural equation modelling to examine how creativity and critical thinking mediated links between 21st century skills and academic outcomes among 297 undergraduate and postgraduate students at King Faisal University. Almulla (2023) reported that creativity and critical thinking supported learning motivation, cooperation, peer engagement, peer interaction, and smart classroom environments. Almulla (2023) found that these skills also strengthened problem solving and academic achievement, leading to a model that connected higher order thinking with academic success in Saudi higher education.

Liu, Gu, and Xu (2024) examined how the Stanford design thinking model supported creativity, self efficacy, inventive problem solving, and technology related motivation among seventy pre-service teachers in a quasi experimental study. Liu et al. (2024) assigned thirty six participants to design thinking activities embedded in a modern educational technology course and thirty four to regular instruction over twelve weeks. Liu et al. (2024) used pre and post measures with multiple statistical tests and reported significant gains in creative confidence, inventive problem solving skills, and motivation toward technology among participants who completed design thinking tasks.

Tampubolon and Sipahutar (2024) designed and tested a project based learning module to improve learning outcomes, critical thinking, and problem solving skills in an animal development course. Tampubolon and Sipahutar (2024) followed the 4D development model, validated the module with material, learning, and layout experts, and collected student feedback to assess feasibility. Tampubolon and Sipahutar (2024) reported that the module received high validation ratings and strong student responses, and experimental testing showed higher post test scores in cognitive achievement, critical thinking, and problem solving when compared with a control group. Tampubolon and Sipahutar (2024) recommended wider implementation and further trials to strengthen evidence.

Reviews Related to Creative Thinking

High levels of creative thinking ability appeared among urban high school students in Dharwad taluk, with no cases of low creative thinking reported (Kumari

et al., 2014). Scores showed that school type, age, and gender did not affect students' creative thinking levels (Kumari et al., 2014).

Jabeen and Khan (2013) examined links between creative thinking skills, self concept, and academic performance among ninth grade students in Budgam district, Jammu and Kashmir. They randomly selected 300 high achievers and 300 low achievers from two educational zones and assessed creativity using Mehdi's 1973 verbal test and self concept using Sharma's 1972 inventory. Their findings showed that high achievers performed better in fluency, flexibility, and originality and also held higher self concept scores than low achievers. They further noted strong positive correlations between self concept, creativity, and academic achievement for both achievement groups.

Bordhan (2015) explored how intelligence and self concept related to creative thinking among 200 male students in higher secondary classes in Rewari district, Haryana. He selected students through random sampling in government schools and focused on dimensions of creativity. His analysis showed that intelligence and self concept had a positive association with creative thinking. He further noted that higher levels of intelligence aligned with stronger originality, flexibility, and fluency. Students with higher self concept also showed stronger performance in these three dimensions.

Creative growth among children from Tribal Communities required supportive relationships, enriched programmes, and revised teaching practices that aligned with their needs (Kar, 2015). The study pointed to the value of redesigned

methods, recognition systems, and classroom environments for strengthening creative development (Kar, 2015).

Susan and Rajaguru (2016) compared creativity and academic achievement among underachieving secondary school students from Tribal Communities and non Tribal groups in Nilgiri district, Tamil Nadu. They worked with 587 students from Tribal Communities and 479 students from non – tribal communities, examining gender distribution within each group. Their findings showed a significant difference in creativity between the two groups, while academic achievement did not differ. They also reported higher levels of fluency, flexibility, and originality among non Tribal underachievers than among students from Tribal Communities.

Bera (2017) investigated how creative thinking related to academic achievement, emotional intelligence, and adjustment among socially backward secondary school students in Paschim Medinipur district, West Bengal. He worked with 606 ninth grade students from Bengali medium schools and assessed links between key variables. His findings showed a positive association between creative thinking and academic achievement. He also reported no meaningful difference in creative thinking levels between students from Scheduled Caste and Scheduled Tribe backgrounds.

Devita Boro (2018) examined creative thinking abilities among elementary school students from Tribal Communities in West Kameng district, Arunachal Pradesh. She assessed 100 students in grades seven and eight using a verbal creative thinking test developed by Baquer Mehdi in 1971. Her results showed no meaningful gender based difference in creative thinking among grade seven students. She also

found an equal level of creative thinking between male and female students in grade eight.

Mehta and Khajuria (2018) studied how socioeconomic status and intelligence related to creative thinking among eighth grade students in Sirsa district. They selected 200 students through random sampling and assessed creativity using the Baqer Mehdi verbal test. They measured socioeconomic status with a scale by R. A. Singh and S. K. Saxena used an intelligence test by Radhey Shyam Jalota. Their analysis with mean, standard deviation, correlation, and t test showed weak links between socioeconomic status, intelligence, and creative thinking.

Thapliyal (2018) examined how academic anxiety related to creativity among students from Tribal Communities. He compared mean scores of elaboration, originality, and total creativity between students with high and low academic anxiety using t ratios. His results showed that students with low academic anxiety displayed higher elaboration and originality than those with high anxiety. They also scored higher on total creativity.

Kumari and Mishra (2020) compared creative potential among 300 male pre-adolescent students from General Category, Scheduled Caste, and Scheduled Tribe backgrounds. They used the Baqer Mehdi test to assess creativity and analyzed results with spreadsheet based tools. Their findings showed that students from Scheduled Tribes scored higher than those from Scheduled Castes. They also noted that students from the General Category recorded the highest creative potential overall.

Adam Malik and Ubaidillah (2020) examined how experiment models and gender shaped the development of students' critical and creative thinking skills. They used a quasi-experimental approach with data from 328 students across five Indonesian colleges, applying multivariate tests to compare outcomes. Their work showed that the learning model played a stronger role than gender in influencing learning results. They also reported that the Multiple Skill Laboratory Activity Model supported growth in critical and creative thinking more than the Higher Order Thinking Laboratory model.

Parikh, Maddulety, and Meadows (2020) examined how Design Thinking training supported the creative development of fifth grade students at the Base of the Pyramid in Mumbai. They used a quasi experimental approach involving 70 students, comparing a training group with a control group across two action research cycles. Their evaluation of worksheets and intervention test sheets showed that divergent thinking instruction strengthened ideation during creative tasks. They also found that mixed method analysis helped capture socio cultural influences and informed the need for strategies that supported creative confidence. Language of instruction emerged as a barrier when it differed from the home language of students, highlighting challenges in concept expression.

Khandate (2020) compared values and creativity among students from Tribal Communities in Gadchiroli district. He selected 200 students through random sampling, with equal representation from urban and rural locations. He assessed values using the Personal Value Scale by Shery and Verma and measured creativity

with the Baqer Mehdi scale. His analysis showed no meaningful difference in values or creativity between students in urban and rural areas.

Improved creative thinking followed drama based English instruction, shown through higher post test scores on fluency, flexibility, and originality compared with pre test results (Desai, 2020). The findings supported the use of drama activities to enhance creativity and language learning among students from Tribal Communities, with recommendations for broader adoption across colleges and further research on teacher performance and student achievement (Desai, 2020).

Prihatin, Wiyanarti, and Kurniawati (2021) explored how Project Based Learning supported the development of creative thinking. They used a qualitative descriptive approach with data from interviews and documentation involving one social studies teacher and 25 seventh grade students. Their results showed that well planned and systematic implementation of Project Based Learning strengthened students' creative thinking, as reflected in project outcomes. They also noted difficulties that included class management, time planning, limited understanding of lesson goals, and the need for clearer project examples.

Capron Puozzo and Audrin (2021) assessed how a creativity focused intervention influenced self efficacy and creative self efficacy. They gathered data through a self reported questionnaire to measure both constructs. Their quantitative results showed no noticeable impact of the intervention on either self efficacy or creative self efficacy. Their qualitative data indicated that students linked creativity with learning and viewed creative processes as helpful, even when difficult.

Yildiz and Yildi (2021) investigated links between creative thinking and scientific process skills among preschool children. They used a correlational design supported by quantitative methods and gathered data through standardized instruments, including the Torrance Tests of Creative Thinking Figural Form A, a scientific process skills scale, and a home environment questionnaire. Their analysis showed a moderately positive relationship between scores of creative thinking and scientific process skills. They also explored whether gender, parents' education, preschool duration, and home environment related to these abilities.

Saeed and Ramdane (2022) reviewed research on how creative thinking models shaped creative thinking skills in high school students. They examined eight studies with 542 students that applied models including Creative Problem Solving, Future Problem Solving Program International, SCAMPER, and quantum based CPS learning. Their review showed that the use of these models improved students' creative thinking skills. They also noted gains in academic performance, idea comprehension, and higher order thinking.

Mishra, Deb, and Dash (2023) investigated the creative thinking skills of secondary school students from Tribal Communities in Sundargarh district, Odisha. They adopted a descriptive survey design and purposely selected 100 students from this community. Their analysis showed no meaningful difference in creative thinking when comparing students by gender. They also reported no gap in creative thinking between students from rural and urban locations.

Ayasrah et al. (2023) investigated how university students practiced creative thinking and how this practice related to academic achievement at the Jordan

University of Science and Technology. They selected 1159 students through random sampling and analyzed their responses using a Likert scale. Their findings showed that students practiced creative thinking at a moderate level, with an average score of 2.96. They also reported gender based differences, noting higher creative thinking practice among male students. Creative thinking practice showed a close relationship with academic achievement, with about one fifth of students who achieved well also reporting moderate levels of creative thinking practice.

Studies related to Achievements

Ana Morais (2006) (2006) examined how pedagogy and students' social background shaped their ability to recognize and apply rules during science problem solving. She focused on the micro context of problem solving to understand students' recognition and realization rules and the challenges they faced. Her results showed a clear link between social class and the coding orientations students used while solving science problems, which influenced their success in recognizing and applying problem solving rules.

Chowdhury (2006) explored how selected family variables related to social preference, academic achievement, and self-concept among elementary school students. Examination scores were used to measure academic achievement, while social preference and self-concept were assessed alongside family factors. His analysis showed no meaningful links between the family variables studied and students' social preference, academic performance, or self-concept. He noted that peers and friendships showed positive indications for shaping self concept and academic outcomes.

Strong correlations between learning approach and course satisfaction appeared among students in problem-based programmes across four professions (Grahame, 2006). Differences in learning patterns across disciplines and limited change in approach over time pointed to the need for clearer guidance when planning problem-based curricula (Grahame, 2006).

More precise instructional decisions and improved use of achievement information appeared after teachers engaged in an extended action research process that shifted their beliefs about their influence on student learning (Helen S., 2006). The work showed that leadership support, ongoing collaboration, and structured reflection were central to helping teachers use data to improve instruction, while also revealing the practical challenges leaders faced during implementation (Helen S., 2006).

Marvin (2006) evaluated how cooperative group work influenced spelling achievement among fourth grade students, including learners with special needs. He applied a return to baseline design with 27 students who completed weekly spelling tests based on words from the grade level reader. His findings showed that cooperative groups improved spelling performance for both students with special needs and their peers compared with individual learning techniques. He concluded that cooperative grouping supported academic gains and helped integrate students with special needs in regular classrooms.

Equivalent cognitive outcomes in science concept attainment were observed among boys and girls after six weeks of analogy-based instruction (Bolatito, 2007).

Results from pre and delayed post tests indicated that socio cultural analogies helped bridge understanding for both groups (Bolatito, 2007).

Georgios (2007) investigated how selected cognitive factors related to performance in non-algorithmic quantitative problem solving in university level physical chemistry. He drew on nine studies involving first year chemistry students at the University of Ioannina, using open book problems that required students to work without supplied data. His analysis with Spearman and Pearson correlations showed weak links between scientific reasoning and problem solving, with working memory showing slightly stronger but still limited association. He reported that functional mental capacity and disembodied ability aligned most strongly with successful problem solving.

Gottfried Spangler (2007) studied how adrenocortical activity related to school performance and type A behaviour among first grade students. He measured salivary cortisol in 20 six-year-olds across three school days and three holiday days, collecting samples in the morning and at noon. His results showed no cortisol differences between school and holiday periods and no clear cortisol response linked to school attendance. He reported lower morning cortisol among children showing type A behaviour and among those with non-optimal school performance, indicating links between behavioural patterns and adrenocortical activity.

Patrick (2007) examined how authoritarianism, dominance, and need for achievement were related among 103 external undergraduate students in Australia. He measured authoritarian attitudes, dominance, and directiveness to test whether authoritarians were motivated to achieve. His findings showed that pro authority

behavior correlated with achievement motivation for both males and females, while authoritarian attitudes aligned with achievement motivation only for males. Dominance and directiveness were linked to achievement motivation for both sexes, and principal component analysis indicated that directiveness primarily reflected dominance. Additionally, achievement motivated females scored higher on self-esteem, reflecting influences of traditional socialization.

Bruce (2014) examined factors linked with academic performance among Indian high school students in Seattle. He focused on five variables, including self concept, achievement motivation, anti Indian discrimination, culture conflict, and family instability. His findings showed that achievement motivation and culture conflict aligned most strongly with academic performance. He recommended targeting these variables when planning support programs for urban Indian students.

Mary (2014) examined how locus of control and different reinforcement types influenced performance in programmed instruction among adolescent boys. She worked with 78 eleventh and twelfth grade students and compared three reinforcement conditions, including no confirmations, confirmations, and feedback paired with monetary exchange. She measured gains from pre to post testing and the number of correct responses. Her analysis showed no meaningful differences in gain scores across reinforcement types, and she interpreted the results in terms of differing motivational orientations among students with internal and external locus of control.

Reviews Related to Teachers' Relationship with Children

Ally et al. (2017) examined the impact of a mobile learning project on access to education in a school in Pakistan, aligning with SDG 4 on inclusive and equitable

quality education. The study involved 74 students from Grades 8 to 10 using tablet computers to access electronic learning materials from the Aptus local server without Internet connectivity. Findings showed that students improved their ability to use mobile technology for learning, and both students and parents reported increased knowledge and interest in studying. Teachers observed heightened engagement and focus during classroom activities.

Inclusive teacher preparation in Ghana showed limited effectiveness in developing knowledge, values, and pedagogical practices needed for inclusive classrooms, affecting progress toward SDG 4 (Nketsia et al., 2020). Surveying 167 final-year trainees and 13 teacher educators in three colleges, the study found that the Special Education Needs course emphasized a medical model of SEN, and only a minority of trainees acquired the skills required for inclusive education.

Education emerged as a central driver for achieving the Sustainable Development Goals, with SDG 4 emphasizing quality education for all (Williams, 2020). Jennifer Williams described how a simple inquiry on social media led to the formation of Teach SDGs, a global network connecting classrooms to the UN's goals. The initiative expanded from a small group of educators to over 40,000 worldwide, demonstrating how teaching practices intersect with multiple SDGs, including health, gender equality, climate action, and justice.

Schools in Africa were found to be ill equipped to deliver the quality education envisioned in SDG 4, and teachers required additional training to implement its ideals (Nakidien et al., 2021). Two empirical studies—one on citizenship and social

cohesion at the high school level and another on assessment for learning at the primary level—highlighted gaps in educational provision and teacher preparedness.

Integration of artificial intelligence in education showed potential to advance Sustainable Development Goal 4, but research remains limited to higher education, excluding school-level teachers (Dewa, 2024). A literature review of 22 Scopus indexed publications from 2010 to 2023 using VOS viewer revealed relationships among authors, institutions, and keywords, highlighting gaps in teacher engagement. Findings emphasized the need for teacher involvement in AI implementation to ensure equitable and sustainable educational outcomes.

Higher school quality was linked to reduced child labour in cocoa agriculture among fifth grade children in rural Côte d'Ivoire (Wortsman et al., 2024). Analysis of 2,168 students across 41 primary schools showed that better infrastructure and teaching materials were associated with lower participation in cocoa work, while domestic and economic activities were unaffected. The findings suggest that investing in quality education can both improve learning outcomes and reduce child labour.

The Digi Craft program effectively developed digital competence among Spanish children aged 6–12, supporting educational sustainability and aligning with SDG 4 (Cabezas-González et al., 2024). Using semi-structured interviews with students and teachers across sixteen centres, the study highlighted positive outcomes in digital literacy after three years of program implementation.

Strong links emerged between quality learning processes, supportive classroom environments, and learning outcomes among 2,425 high school students in West Purwokerto, Indonesia (Yanuarto et al., 2025). Using SEM-AMOS analysis, the

study showed that content-process integration was weaker, indicating the need for curriculum reform, teacher training, and inclusive practices. Findings highlighted that realizing SDG 4 requires a holistic approach addressing multiple interconnected educational dimensions.

Parental involvement in former Model C schools in Tshwane South District, South Africa, was found to be limited, affecting progress toward SDG 4 on quality education (Hlongwane & Lekhetho, 2025). Using a mixed methods approach grounded in Epstein's and Hoover-Dempsey and Sandler's models, the study identified low attendance at parent-teacher meetings and minimal support for children's schoolwork as key challenges, largely linked to socioeconomic constraints.

Alamin et al. (2025) examined the educational challenges faced by students from nomadic communities in Sudan, highlighting the influence of cultural, ethnic, and political factors on access to schooling. They used a triangulation method, combining literature review and expert consultation, to identify eight key barriers, including inadequate data, poverty, nomadic lifestyles, insufficient qualified teachers, and inconsistencies in curriculum content and instructional language. The study also proposed solutions such as curriculum redesign and awareness campaigns to support inclusive education, linking the findings to the achievement of SDG 4 on quality education.

Eriksen (2025) investigated the psychological learning environment in Zambian kindergartens, focusing on teacher-child interactions in conflict situations. Using a qualitative design with classroom observations and teacher interviews, the study revealed that teachers employed physical and verbal forms of violence, despite a government ban on corporal punishment since 2003. Findings also highlighted

pedagogical beliefs aligned with research on positive teacher–child relationships, though gaps remained between these beliefs and actual practices. The study linked these issues to SDG 4, specifically target 4a on safe, non-violent, and inclusive learning environments.

The list of studies reviewed is presented in Table 1.

Table 1

Summary of Studies Sustainable Development Goals (SDGs)

Sl. No	Author(s)	Year	Title of the Study	Country	Findings Summary
1	Boeron	2017	Activities for each Sustainable Development Goal&Implementation Operated from Individual Courses to Natioanal Planning	UN	Target Achievement Depended on Collaboration Among People Education Systemand State Authorities,Respo nsibilities a Aligned across all levels of educational activity Limited understanding of SDGs and Relied on Few Information Sources, No Significant Gender Differences in SDGs Knowledge, Learning Exposure or influence of SDGs on Personal Choices PE teachers see SDGs value but lack training and guidance.
2	Yuan,Yu and Wu	2021	Awareness of Sustainable Development Goals Among Senior High School Students in China	China	
3	Baena-Morales	2024	physical education teachers' perceptions of SDGs and education	Spain	

			for sustainable development		
4	Finatto	2024	Environmental, Social, & Governance Frameworks Supported SDGs Integration in Higher Education.	Brazil	Aligning Governance Structures with SDGs Goals & Expanding Collaboration with Surrounding Communities. Adult learning aids SDGs but lacks sufficient funding and policy support
5	Grotlüschen	2024	The Role of Adult Learning and Education (ALE) in Achieving SDGs	US	Students appreciate SDGs courses but lack hands-on engagement opportunities.
6	Jones	2024	students' perspectives on SDGs at a Japanese higher education institute	Japan	Leaders prioritize SDG 4 but face challenges like funding and access
7	Nupen	2024	South African Higher Education Leaders' Perceptions of SDG 4 Realization	South Africa	Policy Changes that Strengthened inclusive Teaching Practices & Fair Resource Distribution to Achieve Meaningful Progress
8	Ocampo Cantilo & Lazaro	2024	Current Reforms Advanced SDG 4 or Simply Altered Education System	Latin America	Many schools lack SDG 4.A.1-compliant facilities, requiring better infrastructure and policies.
9	Petilo	2024	Cross-Evaluation of Educational Facilities in Compliance with SDG 4.A.1	Philippines	A whole-institution SDGs approach empowers staff and students as
10	Price	2024	A Whole-Institution Approach to Embedding SDGs in Higher Education	UK	

11	Beana & Valero	2025	Professional Development as a Mechanism for SDG Alignment in Physical Education	Korea	sustainability change agents. Standardized guidance & Professional Learning Opportunities Helped Physical Education Programs align more Effectively with SDG goals. Collaboration and accountability help embed SDGs in universities, but face barriers like bureaucracy and limited funding.
12	Teter and Balser	2025	Collaborative Spaces in Higher Education for Sustainable Development	USA	

Summary of Studies Related to Localising sustainable development goals (LSDGs)

Sl. No	Author(s)	Year	Title of the Study	Country	Findings Summary
1	Adams and Nakano	2024	Connecting Student Interest and Motivation in English to the Sustainable Development Goals	Japan	Linking English learning with SDGs boosts student motivation and global awareness. Multiple SDGs-related research impacts were identified in higher education, emphasizing the need for consistent monitoring and evaluation.
2	Mohd et al	2024	Research Impact Assessment on Sustainable Development Goals in Higher Education Institutions: A Qualitative Study	Malaysia	A three-pronged policy approach—hiring diversity, educator training, and DEI programs—is vital
3	Smith and Heyward	2024	Policy Efforts to Meet UNESCO's Sustainable Development Goal 4: A 3-Pronged Approach	US	

					for achieving SDG 4.
4	Suklun and Bengü	2024	Raising Awareness of Sustainable Development Goals in Higher Education Institutions	Turkey	Universities can enhance SDGs awareness by embedding sustainability in education and partnering with external sectors. Graphic design education was aligned with sustainability by identifying 31 key SDGs-related competencies for curriculum enhancement.
5	Tran, Liou, and Yang	2024	Identifying and Validating Sustainable Development Goals-Related Key Competencies in Undergraduate Graphic Design Education	Taiwan	ESG frameworks help integrate SDGs in universities but need strong leadership and community ties
6	Finatto	2024	How Environmental, Social, and Governance (ESG) Frameworks Promote SDGs Integration in Universities	Brazil	Reforms expand access but fall short on quality and equity, hindering true progress toward SDG 4
7	Ocampo Cantillo and Lazaro	2024	Are Educational Reforms Transforming SDG 4 or Merely Reshaping Education Systems	Latin America	

Summary of Studies Related to Life Skills of Students from Tribal Communities

1	Prajina P. V and Godwin. J. Preamsingh	2015	Study of life skills in relation to the academic achievements of tribal children	India	Students From Tribal Communities showed low life skills and academic performance, with a strong link between them
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2	Gadatia and Mohalik	2016	Life Skill Need Assessment among Tribal Students at Secondary Level	India	Students From Tribal Communities needed life skills training, especially in self-awareness, communication, and relationships. Life skills showed no impact on Students From Tribal Communities' academic aspirations.
3	Inez Rose Louis and Dr. Vani Subramanyam	2016	Effect of Life Skills on Academic Aspiration	India	Life skills education builds social, emotional, and cognitive abilities for future readiness
4	Ravindra Prajapati	2017	Significance of Life Skills Education	India	Life skills education at KISS boosted self-esteem, well-being, and helped prevent antisocial behavior among Students From Tribal Communities.
5	Raghunath murmur and Dr. Sunita acharya	2018	Impact of Life Skill Education in Tribal: A Study on Kalinga Institute of Social Sciences (KISS) Adolescent Students	India	Postgraduates showed similar life skills awareness across demographics, supporting integration into education for better learning.
6	Smitha	2018	A Study on awareness of life skills among post graduate students	India	Tribal adolescents had low to average life skills, with higher levels in males and higher secondary students
7	Dr. Pramod D and Dr. K.P. Suresh	2018	Life skills of school-going tribal adolescents of Thiruvananthapuram district	India	

8	Keerti Parmar and Kalpana Jain	2019	Effectiveness of Life Skills Training for Enhancing Self-Esteem among Tribal Youths	India	Life skills training positively enhanced self-esteem among tribal youths.
9	Dr. P. Usha and C.H Usha Rani	2020	Self-development of adolescent tribal girls	India	Life skills supported self-development and empowerment in tribal adolescent girls.
10	Pooja Patil and Sunanda Itagi	2021	Parental education and life skills among tribal (Siddi) and rural adolescents	India	Rural teens had better life skills than Siddi peers, boosted by higher parental education
11	Bansal and Kapur	2022	Facets of Life Skills Education – A Systematic Review	India	Emotional intelligence and problem-solving enhance outcomes, but are hindered by curriculum overload and untrained educators.
12	Suman Kumari and Vishal Sood	2022	life skills among tribal adolescents	India	Tribal adolescents had similar life skills, with low thinking and average social and emotional skills.
13	Bell	2023	Why US Public Schools Do Not Mandate Life Skills Education as a Core Curriculum for Students in Grades 9–12	US	Curriculum priorities limit life skills mandates, calling for advocacy and policy change.
14	Camiré et al.	2023	The Two Continua Model for Life Skills Teaching	US	Teamwork and transferable skills can be developed through sports, supported by teacher training for

15	Hegarty Follis et al.	2023	titled Life Skill Programs: An Exploratory Survey of School Based Programming in the Public High School Setting	US	effective implementation. Only 30% of schools had structured life skills programs, limited by funding and time constraints.
16	Kamble and Kumar	2023	Measuring the ABC of Life Skills: Life Skills Scale Revision and Standardisation for Adult Population	India	The revised life skills scale was reliable, supporting use in adult education and workplace settings.
17	Mohamad Hdyitulah and Dr. Aman	2023	Comparative study of the extent of Life Skills among Tribal and Non-Tribal Adolescents in relation to their Gender and Locale	India	Life skills varied between tribal and non-tribal adolescents based on gender and locale.
18	Vahdani et al.	2023	Cross-Cultural Adaptation and Psychometric Properties of the Persian Version of the Life Skills Scale for Physical Education	Iran	The Persian life skills scale proved reliable for teamwork and goal-setting, supporting broader educational use. Self-advocacy boosted job retention in individuals with ASD, supporting targeted programs and workplace partnerships.
19	Zatz	2023	Life Skills and Employment Outcomes for Individuals with ASD	US	Oracy was weak in disadvantaged areas, prompting calls for classroom focus and teacher training.
20	Montacute et al	2024	Life Lessons 2024: The Development of Oracy and Other Life Skills in School	UK	

21	Maqsood et al.	2024	Parents' Perceptions of Life Skills Education for Empowering Secondary School Students: A Qualitative Exploration	Pakistan	Parents valued life skills but saw poor school integration, urging involvement and awareness efforts.
22	Ravindranath et al	2024	Effectiveness of Life Skills Intervention for Children from Disadvantaged Backgrounds: Insights From 4-Year Longitudinal Study	India	Life skills programs boosted confidence and social skills, supporting long-term interventions for disadvantaged children.
23	Scheidler et al	2024	Long-Term Life-Skill Transfer from Sport-Based Positive Youth Development Programs	US	Leadership and resilience from sports programs lasted into adulthood, supporting long-term engagement and wider research
24	Seo et al	2024	The Effects of Life Skills of Korean College Student Athletes on Adaptation and Satisfaction in College Life	Korea	Time management and stress coping boosted college satisfaction, supporting life skills training in athletics.
25	Shajimon and Abraham	2024	Influence of Gender and Locale on Life Skills among Secondary School Students	India	Urban students had better life skills than rural peers, with no gender differences, suggesting targeted rural support.
26	Shakeela	2024	A Survey Study on the Status of Life Skills of Secondary Students of Dakshina Kannada District	India	Rural students showed lower life skills, calling for targeted support and interventions

27	Sop	2024	The Relationship between Preschool Children's Anxiety and Life Skills: The Mediating Role of Self-Regulation	Turkey	Self-regulation mediated anxiety's effect on coping, supporting early childhood interventions.
28	Karadağ et al	2025	Relationship Between Nutritional Literacy and Healthy Life Skills of University Students	Turkey	Nutritional literacy linked to better self-care and decision-making, supporting nutrition education.
29	Norwine et al.	2025	Using Non-Immersive Virtual Reality to Teach Life Skills to Students with Disabilities in Rural Schools	US	Non-immersive virtual reality significantly improved daily living skills and social interactions among students with disabilities.
30	Scheuring and Thompson	2025	Enhancing Graduate Employability – Exploring the Influence of Experiential Simulation Learning on Life Skill Development	UK	Simulation learning boosted teamwork, critical thinking, and adaptability for graduate employability.
31	Somers et al	2025	Evaluation of Life Skills Training in Minnesota: Implementation and Early Impact Findings	US	Life Skills Training improved drug resistance and social skills, but needed better implementation support.

Summary of Studies Related to Critical Thinking

1	Vojnovich, Christine M	1997	Improving Student Motivation in the Secondary Classroom through the Use of Critical Thinking Skills, Cooperative	US	Critical thinking, cooperative learning, and journaling boosted motivation, participation, and
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			Learning Techniques, and Reflective Journal Writing		problem-solving while reducing behavioural issues
2	Andrade	2006	tension and possibilities in promoting critical literacy in Indian public education	India	Rote learning in Indian schools limits critical thinking; culturally relevant critical literacy can foster active citizenship. Boys favored right-brain and girls left-brain thinking, showing distinct learning and thinking styles.
3	Kalpana and Mridula	2007	Styles of Learning and Critical Thinking among school going students	India	Integrated critical thinking boosted math achievement, with notable group-gender interaction but no gender-based score difference Thinking styles differed by group, with hierarchic and local styles boosting performance, while others hindered it Game-based learning fostered critical thinking through independent thinking, collaboration, and reflection in students.
4	Harish	2010	The Impact of Integrated Critical Thinking on Mathematical Achievement for Secondary Students	India	The study highlights the
5	Stanley V. John, et.al	2011	Thinking Styles and Academic Performance Among Tribal and Non- Tribal Students	India	
6	Marc I. Cicchino	2015	Using Game-Based Learning to Foster Critical Thinking in Student Discourse	US	
7			Critical Thinking and its Importance in		

	I Lenin	2019	Education clarified the role of critical thinking abilities in educational processes and the significance of critical thinking for students enrolled in various types of educational programmes	India	essential role of critical thinking in modern education and its importance across all learning programs.
8	Verburgh	2019	Effectiveness of approaches to stimulate critical thinking in social work curricula	Europe	Mixed methods support critical thinking in social work, but more empirical research is needed. Current educational approaches toward Adivasi communities lack cultural responsiveness and call for more inclusive, democratic models to support meaningful social transformation.
9	Charles Varghees	2020	Adivasi and schooling: a critical reflection on perspectives	India	Critical thinking skills varied by tribe, with Makassar students showing the highest levels across all indicators. Active learning methods effectively enhance critical thinking skills in high school students
10	Aprilla N. Utami and Farida Nurhasanah	2022	The critical thinking ability of indigenous students in West Papua based on their tribe	Indonesia	
11	Raldy Aditya et al	2023	Exploring High School Students' Critical Thinking Skills Using Active Learning	Indonesia	

Summary of Studies Related to problem Solving Skills

1	Monte Lee Randall	2006	The Effect of A Life Skills Curriculum On The Problem-Solving Abilities Of Tribal College Students	US	The Life Skills curriculum improved tribal college students' problem-solving and decision-making abilities. Tool use and purposeful actions help trace the early development of problem-solving skills in young children.
2	Rachel Keen	2011	The Development of problem solving in young children	USA	Sex and caste affected problem-solving ability, while only caste influenced academic achievement; no interaction effect was found. Seasonal migration disrupts Students From Tribal Communities' education in Jammu and Kashmir, affecting enrolment, academic achievement, and language and math skills, with notable gender and migration-based differences Students From Tribal Communities in tertiary education face
3	Dr. Renu Gupta	2013	Problem Solving Ability and Academic Achievement Among the Students Belonging to Scheduled Tribe and Scheduled Caste Categories	India	
4	Shazia Sultan and Dr. Kumar Vivek Kant	2014	Impact of Seasonal Migration on Education of Tribal Communities in Jammu and Kashmir	India	
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	Smruti Sudha Behera et al	2015	Communication Barriers Faced by Tribal Students in Tertiary Education	India	communication challenges that can be reduced through flexible language use, supportive teaching, and inclusive practices
6	T. Brahmanandam and T. Bosu Babu	2016	Educational Status among the Scheduled Tribes: Issues and Challenges	India	Scheduled Tribes face low educational progress due to culturally disconnected education and lack of quality schools, emphasizing the need for nearby residential instituti ons. Vedic Mathematics improved Students From Tribal Communities'
7	Dr. Smitha S, June	2017	Empowering Tribal Population Through Indian Intellectual Traditions Of Vedic Mathematics	India	problem-solving skills, speed, and confidence, emphasizing the need for targeted academic support. Major educational barriers for ST students in Coochbehar
8	Pradip Debnath, P. D	2017	The Educational Problems Of Scheduled Tribe (St) Students At Elementary Level In Coochbehar District	India	include poverty, inaccessibility, early marriage, and language issues.
9	A B Lestari and Djukri	2019	The Problem-Solving Skills of Senior High School Students on Biology in Temanggung	Indonesia	Students showed moderate problem-solving skills, with significant

				gender differences
10	Gadatia	2020	Life Skills Need Assessment Among Tribal Students at Secondary Level	India The study found that tribal secondary students need life skills education, highlighting the importance of training teachers and including life skills in the curriculum. Higher secondary students had high problem-solving ability and moderate creativity, with no significant gender differences or correlation between the two. Functional literacy positively influenced 4th-grade students' problem-solving skills and significantly predicted them.
11	M.Kumar	2020	A Study of Problem-Solving Ability and Creativity among the Higher Secondary Students	India ST students in West Bengal face major barriers in higher education due to social, economic, and educational marginalization, requiring inclusive efforts for their educational upliftment.
12	Özenç et al	2021	The Relationship between Functional Literacy and Problem-Solving Skills: A Study on 4th-Grade Students	Turkey ICT-based materials showed some improvement in
13	Haru Roy	2021	Scheduled Tribe Students Faced Problems In Higher Education In West Bengal: A Study	India
14	Sikk et al	2021	Action Research to Study Problem Solving Skills of	Estonia

			Primary School Physics Students.		problem-solving skills, but statistical evidence was inconclusive. Tribal adolescents had similar life skills, with low thinking and average social and emotional skills. Problem solving and reasoning are key aspects of critical thinking in young children, supported by stories, language use, and classroom interacti ons. Motion-based learning technologies help children engage in balanced play and problem-solving, with multimodal data revealing links between their behavior and learning outcomes
15	Suman Kumari and Vishal Sood	2022	life skills among tribal adolescents	India	
16	Catherine O Reilly et al	2022	Critical thinking in the preschool classroom – A systematic literature review	Ireland	
17	Serena Lee- Cultura	2022	Children’s play and problem – solving in motion-based learning technologies using a multi modal mixed methods approach	Europe	
18	Arici et al	2023	An Investigation of Factors Related to Collaborative Problem-Solving Skills with Mediation Models	Turkey	School belonging and disciplinary climate positively influenced collaborative problem-solving skills, while teamwork, relationships, and extracurricular activities showed no significant mediation effect.. Applying intervention
19			Implementing Theoretical		

	Ovadiya, Tikva	2023	Intervention Principles in Teaching Mathematics to Struggling Students to Promote Problem-Solving Skills	Israel	principles in math teaching enhanced problem-solving skills and class participation among struggling high school students
20	Daniel J. Backes	2023	Intervention and Implementation of Analytical Problem-Solving Skills in the Secondary Classroom	US	Effective training helps secondary STEM teachers implement analytical problem-solving skills successfully in classrooms.
21	Widodo	2023	Effects of Worksheets on Problem-Solving Skills: Meta-Analytic Studies	Indonesia	Worksheets significantly improved students' problem-solving skills.
22	Carmen Saunders-Russell	2023	Using Creative Assignments to Reinforce Innovation, Problem Solving, Creativity, and Critical-Thinking Skills	US	Creative assignments improved problem-solving, creativity, and critical thinking by linking learning to real-world experiences.
23	Widiana	2024	Framework Problem Solving Based Augmented Reality Media to Empower Scientific Explanation Skill	Indonesia	Problem-solving-based augmented reality media effectively enhanced students' scientific explanation skills more than traditional methods
24	Çakir et al	2024	Socio-Mathematical Norms Related to Problem Solving in a Gifted and Talented Mathematics Classroom	Turkey	Gifted students provided varied solutions, but lack of evaluation norms led to

25	Widyaningtyas et al	2024	Creative Physics Problem Solving Based on Local Culture to Improve Creative Thinking and Problem-Solving Skills	Indonesia	lower-level problem-solving. Integrating local culture through the Cripics-Qu model effectively enhanced students' creative thinking and problem-solving skills in physics. Both video and traditional games positively influenced children's social problem-solving skills. Critical thinking and creativity boosted motivation, peer interaction, and academic performance among Saudi university students
26	Eyup Yilmaz & Mark D. Griffiths	2023	Children's social problem-solving skills in playing video games and traditional games: A systematic review	Turkey and UK	
27	Mohammed Abdullatif Almulla	2023	Constructivism learning theory: A paradigm for students critical thinking, creativity, and problem solving to affect academic performance in higher education	Saudi Arabia	
28	Liu et al	2024	The Impact of the Design Thinking Model on Pre-Service Teachers' Creativity Self-Efficacy, Inventive Problem-Solving Skills, and Technology-Related Motivation	China	Design Thinking significantly enhanced pre-service teachers' creativity, problem-solving skills, and tech-related motivation.
29	Mindo Laura Victoria Tampubolon & Herbert Sipahutar	2024	Development of Project-Based Modules to Improve Learning Outcomes, Critical Thinking and Problem-Solving Skills	Indonesia	A project-based module effectively enhanced students' learning outcomes, critical thinking, and problem-solving skills.

Summary of Studies Related to creative Thinking

1	Samia Jabeen and Mahmood Ahmed Khan	2013	Creative thinking abilities and self-concept of high and low achievers	India	High achievers showed higher creativity and self-concept than low achievers, with a strong positive correlation between self-concept, creativity, and academic performance
2	Bordhan	2015	A Study of Creative Thinking in Relation to Intelligence and Self-Concept of 10 +2 Students	India	Intelligence and self-concept positively influence creative thinking, enhancing originality, flexibility, and fluency
3	Dr. Purbasha Kar	2015	Need of Creative Environment for Development of Tribal Children	India	Highlights the need for a creative school environment to foster creativity in tribal children through improved teaching methods and supportive teacher-student relationships.
4	Dr. Susan and Dr. Rajaguru	2016	A Comparative Study on Creativity and Academic Achievement among Tribal and Non-Tribal Underachievers in Nilgiri District, Tamil Nadu	India	Non-tribal underachievers were more creative than tribal underachievers, while academic achievement showed no significant difference between the groups.

5	Sritidhar Bera	2017	Academic Achievement in Relation to Creative Thinking, Emotional Intelligence, and Adjustment of Socially Backward Secondary Students in Paschim Medinipur, West Bengal.	India	Creative thinking positively correlated with academic achievement, with SC and ST students showing similar levels of creativity.
6	Devita Boro	2018	Creative Thinking Ability of Tribal Elementary School Students in West Kameng District of Arunachal Pradesh	India	Grade VII and VIII tribal boys and girls showed similar levels of creative thinking ability.
7	Jeenat Mehta and Dr. Jyoti Khajuria	2018	Creative thinking of middle school students in relation to their socio-economic status and intelligence	India	There was little correlation between creative thinking, intelligence, and socio-economic status. Low academic anxiety was linked to higher creativity, elaboration, and originality among Students From Tribal Communities.
8	Pramod Thapliyal	2018	A Study on the Relationship of Creativity with Academic Anxiety among Tribal Students	India	General category students showed the highest creative potential, followed by scheduled tribe and scheduled caste students.
9	Dr. Prem Kumari and Saurabh Mishra	2020	Comparative study of creative potential between general category, scheduled castes and scheduled tribes of pre-adolescent children	India	MSLAM was more effective than HOT Lab in
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	Adam Malik and Mujib Ubaidillah	2020	Students Critical-Creative Thinking Skill: A Multivariate Analysis of Experiments and Gender	Indonesia	enhancing students' critical and creative thinking, with experiment type influencing outcomes more than gender.
11	C Parikh, K Maddulety and C. J Meadows	2020	Preparing Base of Pyramid (BOP) Children in India for Creativity: A Quasi-Experimental Study Using Design Thinking	India	Design Thinking training improved creative abilities in BOP students, with language identified as a key barrier.
12	Dr. Vijaykumar Bhayyaji Khandate	2020	Comparative Study of Value and Creativity among Tribal Students	India	No difference in values and creativity between urban and rural Students From Tribal Communities Teaching English through drama improved Students From Tribal Communities' creative thinking skills like fluency, flexibility, and originality.
13	Falguni P Desai	2020	Teaching English through drama to tribal students of undergraduate level at remote area of south Gujarat region in India	India	Project-Based Learning improved students' creative thinking, despite challenges in class management and student understanding.
14	Ririn Prihatin et al	2021	The Analysis of Students' Creative Thinking Skills through the Implementation of the Project Based Learning Model in Social Studies Learning	Indonesia	The intervention showed no quantitative impact on self-efficacy or
15			Improving self-efficacy and creative		

	Isabelle Capron Puozzo and Catherine Audrin	2021	self-efficacy to foster creativity and learning in schools	Italy	creative self- efficacy, but students recognized that creativity supports learning. Preschoolers' creative thinking was moderately positively linked to their scientific process s kills.
16	Cansu Yildiz and Tulin Guler Yildi	2021	Exploring the relationship between creative thinking and scientific process skills of preschool children The effect of implementation of a creative thinking model on the development of creative thinking skills in high school students	Turkey	Creative thinking models like CPS effectively improved students' creativity, academic performance, and higher-order thinking skills
17	Brwa Adnan Saeed and Tahraoui Ramdane	2022		Malaysia	Tribal secondary students in Sundargarh showed similar creative thinking abilities regardless of gender or location.
18	Aishwarya Mishra, Joy Prakash Deb and Ashish Dash	2023	A Study on Creative Thinking Ability of Tribal Secondary School Students of Sundergarh District, Odisha	India	
19	Samer Ayasrah et. al	2023	Practicing creative thinking and its relation to academic achievement	Jordan	Students moderately practiced creative thinking, which was positively linked to academic achieve ment.

Summary of Studies Learning Quality of Children

Sl. No	Author(s)	Year	Title of the Study	Country	Findings Summary
1	M, Reshma Das, Zachariah, Binu	2025	Acculturation and English Writing Anxiety among Indigenous Students of Kerala	India	Study examines how acculturation influences English classroom and writing anxiety among tribal students in Kerala. SDG 4, emphasizing inclusive and equitable quality education. The social well-being of children became a significant component of classroom management. The aim of the study was to explore how primary school teachers in central Kerala comprehend social well-being while managing child learners.
2	George. Jogy, Babu, N. R. Suresh	2025	Classroom Management of Children through Health Promoting Lenses: Conception of Social Well-Being among Primary School Teachers	India	Teacher involvement and limited UDL implementation affect quality learning in Indonesian inclusive schools, highlighting the need for stronger collaboration and attitudes.
3	Irvan, Muchamad, Muhammad Nurrohman Jauhari, Ahsan Romadlon Junaidi, Lutfi Isnii Badiah, and Amelia Rizky Idhartono	2023	Involvement of Teachers in Inclusive Schools for Quality Learning Design and Quality Student Learning	Indonesia	The study analyses how Malayalam
4	Piyus, Glinicy	2025	Literary Child Subjects and Childhoods in	India	

			Kerala: Agency and Intersections in the Late 20th Century.		literature shaped hegemonic middle-class childhood ideals in late-twentieth-century Kerala through classed, gendered, and aetnonormative representations. The study explores novice ESL teachers' experiences with e-learning in Kerala, revealing significant challenges and notable impacts on students' learning. The study examines COVID-era quality-sustaining practices at a Kerala upper primary school, highlighting high student participation and stakeholder support. UNICEF supports integrating climate change education into India's National Curriculum Framework to address climate impacts on children's health, schooling, and learning. The book evaluates out-of-school time
5	P, Muhammedali C	2024	Novice ESL Teachers Experience with Online (E-Learning) Education	India	
6	Anupama, R., K. Jayashree, and C. H. Padmanabha		Quality Sustaining Practices of Government Upper Primary School Puracherry during Corona Pandemic -- An Exploratory Study.	India	
7	Unicef	2023	<i>Paving the Way for a Climate Resilient Education System. Education Case Study -- India.</i>	India	
8	Deborah Moroney, Editor, Editor Priyanka Nalamada	2025	<i>The Future of Youth Development:</i>	India	

			<i>Building Systems and Strengthening Programs. Consensus Study Report</i>		programs, recommending policy, quality, and research improvements to strengthen youth development and equitable access nationwide. Higher-priced preschool reading apps show better literacy, multimedia, and diversity quality, indicating economic barriers may widen educational inequalities among children. Parental emotional support boosts children's science engagement, while cognitive and science-specific support improves knowledge, highlighting the importance of interaction quality in home science learning.
9	Bruner, Lori, and Natalia I. Kucirkova.	2025	The Price of Learning: Assessing Cost versus Quality in Children's Reading Apps	India	
10	Dominke, Henning, Julia Barenthien, Elisa Oppermann, Lars Burghardt, and Mirjam Steffensky.	2025	The Quality of Interactions in the Home Science Environment and Associations with Children's Science Learning	India	

Summary of Studies Teachers relationship with children

Sl. No	Author(s)	Year	Title of the Study	Country	Findings Summary
1	Ally et al.	2017	Use of Tablet Computers to Improve Access to Education in a Remote Location	India	Mobile learning using Aptus tablets improved access, engagement, and academic performance among Pakistani

2	Nketsia et al.,	2020	Teacher Educators' and Teacher Trainees' Perspective on Teacher Training for Sustainable Development	Poland	secondary students, supporting SDG 4 goals for inclusive education. The study finds Ghana's SEN teacher training inadequately promotes inclusive, equitable SDG 4 practices, being dominated by medical-model perspectives and limited inclusive pedagogy. The article highlights Teach SDGs, a global educator network mobilizing classrooms to advance SDGs, emphasizing education's central role in achieving sustainable development. African schools lack resources and teacher capacity to meet SDG 4, requiring stronger training and multi-stakeholder collaboration to achieve quality education.
	Williams,	2020	Educators Are the Global Goals	US	The study finds AI research supports SDG 4 but neglects school teachers, stressing their inclusion to ensure equitable,
	Nakidien et al.,	2021	Teachers and Teacher Education: Limitations and Possibilities of Attaining SDG 4 in South Africa	Africa	
	Dewa,	2024	Artificial Intelligence for Educational Sustainability in the South African School System: A Bibliometric Analysis and Literature Review	South Africa	

				sustainable educational innovation. Higher-quality schools in Côte d'Ivoire reduce children's involvement in cocoa labour, indicating education quality investments can simultaneously curb child labour and improve learning. The Digi Craft program successfully improved Spanish children's digital competence, supporting SDG 4 goals for inclusive, sustainable, and quality education. The study shows SDG 4 implementation in Indonesian high schools requires integrated content, pedagogy, and environments to achieve inclusive, quality learning outcomes. Socioeconomic barriers limit parental involvement in South Africa's former Model C schools, hindering SDG 4, requiring hybrid
Wortsman et al.,	2024	Accelerating Progress towards Eradicating Child Labour (SDG8.7) with Quality Education (SDG4): School Quality Is Linked to Reduced Child Cocoa Labour in Côte d'Ivoire	India	
Cabezas-González et al.,	2024	Evaluating Digi Craft for the Development of Digital Competence: A Qualitative Approach	USA	
Yanuarto et al.,	2025	Education That Matters: Investigating the Quality of Secondary Schooling in Support of Sustainable Development Goal 4	US	
Hlongwane & Lekhetho,	2025	Rethinking Parental Involvement Interventions to Attain Sustainable Quality Education in South Africa	South Africa	

					communication and engagement strategies. The study identifies key barriers to educating Sudanese nomadic children and proposes curriculum reform and targeted strategies to support SDG 4 inclusion. The study reveals contradictions between teachers' inclusive beliefs and violent practices in Zambian kindergartens, undermining SDG 4 goals for safe learning environments.
	Alamin et al.	2025	The Challenges and Solutions of Maintaining Education for Nomadic Students in Sudan: Insights from the Literature and Experts	Sudan	
	Eriksen	2025	The Psychological Learning Environment in Conflict Situations between Kindergarten Teachers and Children in Zambian Kindergartens	Zambian	

Summary of Studies related to Achievement

Sl. No	Author(s)	Year	Title of the Study	Country	Findings Summary
1	Ana Morais	2006	social background shaped their ability to recognize and apply rules during science problem solving. She focused on the micro context of problem solving to understand students'	India	link between social class and the coding orientations students used while solving science problems, which influenced their success in recognizing and applying problem solving rules
2	Chowdhury	2006	family variables related to social preference, academic achievement, and self-	India	no meaningful links between the family variables studied and students' social

			concept among elementary school students		preference, academic performance, or self-concept. He noted that peers and friendships showed positive indications for shaping self-concept and academic outcomes. Differences in learning patterns across disciplines and limited change in approach over time pointed to the need for clearer guidance when planning problem-based curricula
3	Grahame,	2006	Strong correlations between learning approach and course satisfaction appeared among students in problem-based programmes across four professions	India	leadership support, ongoing collaboration, and structured reflection were central to helping teachers use data to improve instruction
4	Helen S.	2006	Use of achievement information appeared after teachers engaged in an extended action research process that shifted their beliefs about their influence on student learning Cooperative group work influenced spelling achievement among fourth grade students, including learners with special needs	India	Cooperative grouping supported academic gains and helped integrate students with special needs in regular classrooms. Pre and delayed post tests indicated that socio cultural analogies helped bridge understanding for both groups
5	Marvin	2006	Equivalent cognitive outcomes in science concept attainment were observed among boys and girls after six weeks of analogy-based instruction	India	functional mental capacity and disembodied ability aligned most
6	Bolatito,	2007	cognitive factors related to performance in non-algorithmic quantitative problem	India	
7	Georgios	2007			

			solving in university level physical chemistry		strongly with successful problem solving lower morning cortisol among children showing type A behaviour and among those with non-optimal school performance, indicating links between behavioural patterns and adrenocortical activity
8	Gottfried Spangler	2007	adrenocortical activity related to school performance and type A behaviour among first grade students	India	achievement motivated females scored higher on self-esteem, reflecting influences of traditional socialization.
9	Patrick	2007	authoritarianism, dominance, and need for achievement were related among 103 external undergraduate students in Australia	Australia	achievement motivation and culture conflict aligned most strongly with academic performance
10	Bruce	2014	factors linked with academic performance among Indian high school students in Seattle	India	no meaningful differences in gain scores across reinforcement types, and she interpreted the results in terms of differing
11	Mary	2014	locus of control and different reinforcement types influenced performance in programmed instruction among adolescent boys	India	

Research Gap and Conclusion

This review synthesizes research on life skills, critical thinking, creativity, and Sustainable Development Goals (SDGs) in education, with emphasis on diverse learner groups including students with disabilities, rural, and tribal populations.

SDGs in Education: Integrating sustainability into curricula promotes awareness and motivates learners. Whole-institution strategies empower students and educators as agents of change, while physical education and adult learning advance health and equality goals. Persistent challenges include underfunding, poor infrastructure, inadequate teacher preparation, bureaucratic inertia, weak leadership, and limited community engagement.

Life Skills Development: Interventions, such as non-immersive VR, enhance daily living and social skills in students with disabilities, while communication, resilience, and critical thinking skills foster self-esteem, problem-solving, and job retention, notably for individuals with ASD. Sports, oracy training, and time/stress management build teamwork, academic satisfaction, and resilience. Parents value life skills, but curricular integration remains weak. Rural and Students from Tribal Communities often exhibit lower life skills due to socio-economic constraints, though targeted programs like KISS improve self-esteem, well-being, and behaviour. Challenges include curriculum overload, inadequate teacher training, and limited structured programs, with pronounced urban–rural and tribal–non-tribal disparities.

Critical Thinking & Problem-Solving: Active, game-based, and culturally relevant pedagogies strengthen critical thinking, which is linked to academic achievement and engagement. Project-based and design-thinking approaches improve

creativity and problem-solving, but their impact is constrained by rote learning practices, disconnected curricula, and socio-economic gaps.

Creativity: Skills like originality, flexibility, and fluency correlate with academic success. Drama-based learning, Creative Problem Solving (CPS), and project-based methods enhance creativity, with low anxiety fostering better outcomes. Barriers include language difficulties, insufficient teacher preparation, and unsupportive environments.

The identified research gap emphasizes the importance of conducting more comprehensive and extensive studies on life skills interventions. Conducting longitudinal studies is crucial for monitoring the long-term effects and the sustainability of these impacts. Comparing different countries can provide insights into how varying cultural, economic, and policy environments influence effectiveness. Creating culturally flexible models helps ensure that interventions stay pertinent in a variety of contexts. Frameworks for impact assessment are needed to evaluate success beyond just immediate results, concentrating on tangible changes in the real world. Furthermore, studies on cost-effectiveness can assist policymakers in distributing resources wisely, promoting the scalability and sustainability of programs. Tackling these gaps will enhance evidence-based approaches across sectors such as education, health, employment, and social development. So, the researcher initiated and completed a study on these variables to fill the research gap and entitled a study on ‘Development and Validation of a Localized Sustainable Development Goals Framework for Quality Education and Evaluating Its Effect on Students from Tribal Communities in Attappadi’.

METHODOLOGY

-
- *Method Adopted for the Study*
 - *Variables of the Study*
 - *Sample Selected for the Study*
 - *Procedure of the Study*
 - *Tools and Techniques Used for the Study*
 - *Statistical Techniques Used for Analysing the Data*
 - *Ethics Approval Statements*
-

For a good and reliable research, it is better to follow a systematic approach to the research problem. The systematic approach, in research is termed as research methodology.

Based on the reviews of past researches and the nature of the problem, the researcher prepares an outline of the research to follow for reaching the solution. This will help to get a valid and reliable result.

This chapter explains in detail the steps followed by the researcher to reach the findings. The methodology is presented under the following headings:

- Method Adopted for the Study
- Variables of the Study
- Sample Selected for the Study
- Procedure of the Study
- Tools Used for the Study
- Statistical Techniques Used for Analysing the Data

Method Adopted for the Study

The present study adopted an explanatory sequential mixed method design. In the first phase, quantitative data were collected and analysed to examine changes in learning quality, academic achievement, life skills, and teacher–child relationships before, during, and after the implementation of the LSDGs framework. In the second

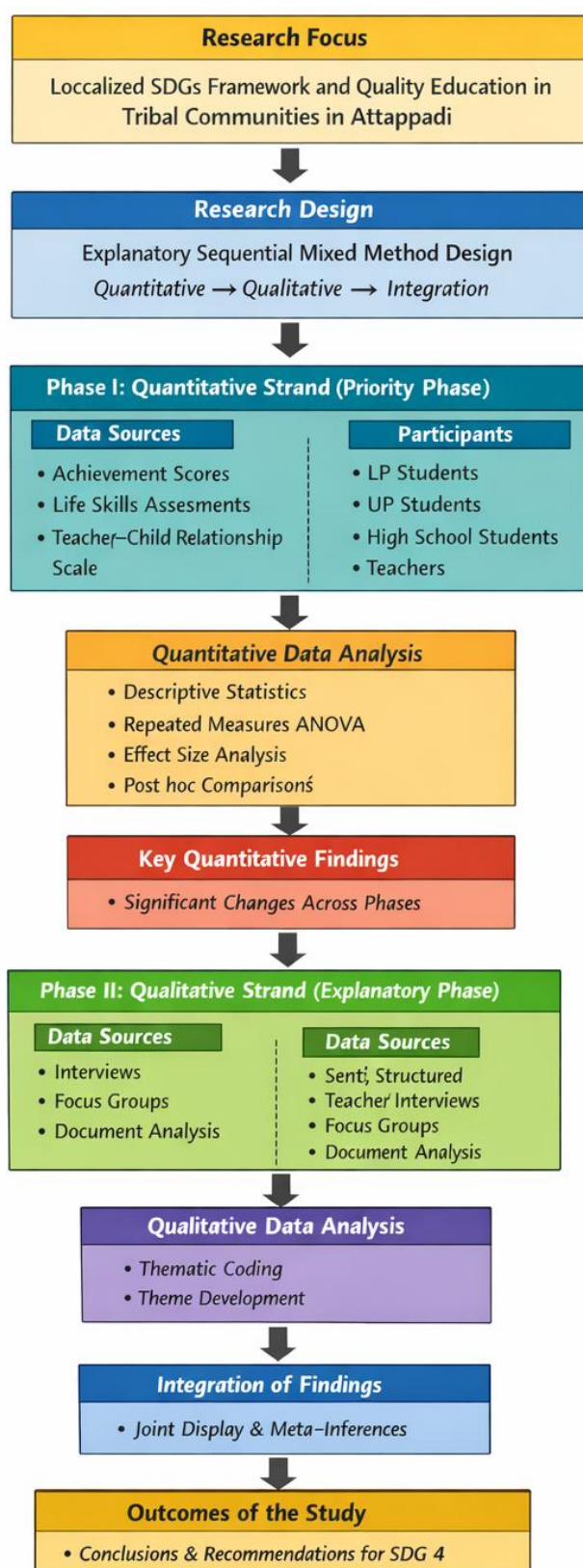
phase, qualitative data were collected through interviews, focus group discussions, and document analysis to explain, interpret, and contextualise the quantitative findings. Integration of both strands was achieved through joint display analysis and meta-inferences. In the quantitative part a single group experimental design is included. A single-group pretest–posttest design measures one group before and after an intervention to see if change has occurred. In this study, the SDGs framework is introduced to improve life skills, relationships with children, academic achievement, and learning quality. First, a pretest is conducted using questionnaires, tests, and observations to understand learners’ baseline levels. Then the SDGs-based activities, lessons, and projects are implemented, with teachers following structured plans and monitoring progress. After the intervention, the same tools are used again for the post-test to measure any improvement. This design is simple and practical, especially when a comparison group is not available, but it can be affected by factors like natural growth and testing effects. To reduce these issues, researcher use consistent tools, and proper documentation. Data are compared using repeated measures of ANOVA to see if the scores increased.

The research followed an explanatory sequential mixed method design consisting of two distinct but interconnected phases. In the first phase, quantitative data were collected from students and teachers to assess learning quality, academic achievement, life skills, and teacher–child relationships across three time points: pre-LSDGs 2022, mid-implementation 2023, and post-LSDGs 2024. Quantitative analysis was carried out using descriptive statistics, repeated measures ANOVA,

effect size estimation, and post hoc comparisons to determine the magnitude and significance of change over time.

In the second phase, qualitative data were collected through semi-structured interviews, focus group discussions, and document analysis involving teachers and key stakeholders. The qualitative strand aimed to explain and contextualise the quantitative results by identifying themes related to pedagogical change, relational dynamics, classroom practices, and learner engagement.

Integration occurred at the interpretation stage through joint display analysis, where qualitative themes were systematically aligned with quantitative findings to generate meta-inferences. This integration enabled a comprehensive understanding of how and why the Localised Sustainable Development Goals framework influenced quality education outcomes among students from tribal communities in Attappadi.



Variables of the Study

For the present study the following variables are in view:

Independent variable

- LSDGs-based intervention

Dependent variables

- Teachers' relationship with children
- Learning quality of children
- Academic achievement
- Life skills

Objectives of the Study

1. To examine the status of quality education among students from tribal communities in Attappadi in relation to Sustainable Development Goal 4 (Quality Education) prior to the implementation of the Localized Sustainable Development Goals (LSDGs) framework.
2. To design and develop a localised Sustainable Development Goals (LSDGs) framework tailored to the socio-cultural and educational context of Attappadi.
3. To validate the developed LSDGs framework through expert evaluation, pilot testing, and stakeholder feedback.
4. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Teachers' Relationship with Children

- Before the implementation of LSDGs
- 5. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Teachers' Relationship with Children
 - after the implementation of LSDGs
- 6. To compare the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Teachers' Relationship with Children
 - Before and after the implementation of LSDGs
- 7. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Learning Quality of Children
 - Before the implementation of LSDGs
- 8. To assess the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Learning Quality of Children
 - After the implementation of LSDGs
- 9. To compare the status of quality education among students from tribal communities based on SDGs framework with respect to
 - Learning Quality of Children
 - Before and after the implementation of LSDGs
- 10. To compare the status of quality education among lower primary students from tribal communities based on SDGs framework with respect to

- Their Achievement
 - Before, during, and after the implementation of LSDGs
11. To compare the status of quality education among upper primary students from tribal communities based on SDGs framework with respect to
- Their Achievement
 - Before, during, and after the implementation of LSDGs
12. To compare the status of quality education among high school students from tribal communities based on SDGs framework with respect to
- Their Achievement
 - Before, during, and after the implementation of LSDGs
13. To assess the status of quality education among lower primary students from tribal communities based on SDGs framework with respect to
- Life skills
 - Before, during, and after the implementation of LSDGs
14. To assess the status of quality education among upper primary students from tribal communities based on SDGs framework with respect to
- Life skills
 - Before, during, and after the implementation of LSDGs
15. To compare the status of quality education among high school students from tribal communities based on SDGs framework with respect to
- Life skills
 - Before, during, and after the implementation of LSDGs

16. To examine the current status of quality education among students from tribal communities in the context of Sustainable Development Goal 4 (SDGs– Quality Education) after the implementation LSDGs

Population of the study

The tribes among the students of lower primary, upper primary and secondary schools of Attappadi constitute the population of the present study.

Sample of the study

1259 Students from Tribal Communities from different lower primary, upper primary and secondary schools of Attappadi constituted the sample for the study.

Table 2 shows the split up of the sample.

Table 2

Sample Distribution of the Present Study

Sample Taken	n	Boys	Girls
Primary Classes	426	209	217
Upper Primary Classes	413	206	207
High School	420	208	212
N	1259	623	636

Tools and Techniques Used for the Present Study

The investigator, for the purpose of proceeding the study, used the following tools:

- A tool for assessing The Teachers Relationship with Children

- A tool for assessing the Learning Quality of Children
- SDGs Local Indicator Framework prepared and standardized by the researcher and the guide.
- LSDGs Validation Tool Kit
- Life Skill Assessment Test prepared and standardized by the researcher with the guidance of the research guide
- Document Analysis Schedule
- Semi structured Interview for the Teachers and other stakeholders
- The score obtained by the learners in the annual exam were used as the score for achievement in this study

Teachers Relationship with Children

The development and standardization of the Tool to assess the Teachers Relationship with Children (TARC) for assessing the perceived quality of relational, emotional, and pedagogical interactions between children and the significant adults in their learning environment—such as teachers and parents—followed a systematic set of procedures. The construct ‘Relationship with Children’ encompasses various dimensions including emotional support, communication, trust, respect, responsiveness, and participatory engagement. To ensure that the scale is valid, reliable, and appropriate for use with higher secondary school students, the following essential steps were undertaken during its construction and standardization:

- Planning of the Tool
- Preparation of the Tool

- Mode of Answering
- Scoring Procedure
- Try-Out
- Item Analysis
- Preparation of the Final Tool

Each of these stages plays a crucial role in ensuring the scientific quality of the tool. The finalized scale aims to provide a comprehensive, objective measure of the relational environment surrounding children, highlighting the degree of emotional warmth, guidance, communication, and support they experience in their daily lives. This tool ultimately supports educators, researchers, and practitioners in understanding how relational factors influence children's well-being and learning outcomes.

To develop a tool for assessing Relationship with Children, it is important to identify the key dimensions that define positive and supportive interactions within the learning environment. This tool focuses on understanding how teachers, students, and parents connect emotionally, communicate, and participate in the educational process. It evaluates the quality of interactions, the level of support provided, and the opportunities children receive to express themselves and engage meaningfully. The following dimensions capture these essential aspects.

Planning of the Tool

(i) Relationship with Children — Key Dimensions

This section evaluates the emotional, pedagogical, and participatory environment between teachers, students, and parents. The following dimensions can be identified and given in Table 3

Table 3

Dimensions of Teachers relationship with children

Dimension	Core Focus	Related Items (Question Nos.)	Description
1. Child-Centered Record Keeping and Monitoring	Maintaining comprehensive child profiles	Q1, Q2	Emphasizes systematic documentation of children's background, progress, and performance.
2. Individualized Attention and Inclusion	Ensuring participation and support for all learners	Q3, Q14	Focuses on activities and special classes for children needing extra academic or social support.
3. Holistic Development (Artistic, Creative, and Physical)	Nurturing children's non-academic abilities	Q4, Q6, Q10, Q11, Q12	Covers opportunities for creativity, leadership, and participation in fairs, clubs, and co-curricular programs.
4. Parent–Teacher Communication and Collaboration	Strengthening parental involvement in learning	Q2, Q5, Q13	Looks at feedback mechanisms, communication channels, and shared understanding of learning progress.

Dimension	Core Focus	Related Items (Question Nos.)	Description
5. Experiential and Activity-Based Learning	Learning through exposure and engagement	Q7, Q9	Includes study trips, play-based breaks, and interactive methods enhancing classroom learning.
6. Access and Equity in Education	Providing equal opportunities for all children	Q14, Q15	Examines provisions for backward or economically weaker students to ensure inclusive education.
7. Integration of ICT and Modern Learning Tools	Incorporating digital literacy and IT-based learning	Q8	Reflects inclusion of technology and digital communication in curriculum.

Preparation of the Tool

A pool of questions was prepared. From the pool of questions 36 questions were selected to make the tool.

The development of the tool followed a systematic and structured procedure consistent with standard research instrument construction guidelines. Initially, a comprehensive pool of questions was generated based on an extensive review of literature, field observations, curriculum frameworks, and expert consultations related to teacher–child relationships, inclusive practices, and classroom processes. This preliminary item pool included a broad range of statements intended to capture the multidimensional nature of teachers’ relationships with children, including record

keeping, individualized support, holistic development, parent–teacher collaboration, experiential learning, equity, and ICT integration.

Following the generation of the initial pool, the items were carefully reviewed to ensure clarity, relevance, and alignment with the study’s objectives. Redundant, overlapping, or ambiguous questions were removed or refined. Expert validation was then sought from specialists in education, child development, and research methodology to evaluate the content adequacy, representativeness, and appropriateness of the items. Based on their suggestions, several items were modified for improved wording, and a few were eliminated due to low relevance or conceptual overlap.

From the refined pool, 36 questions were systematically selected to form the final tool. These items were organized into Part A (structured items rated on a three-point scale: *Constantly*, *Occasionally*, *Not at all*) and Part B (open-ended questions grouped under key dimensions). The structured items were designed to quantitatively assess the frequency of teacher practices, while the open-ended questions captured qualitative insights into teachers’ experiences and reflective practices. The final tool thus ensured comprehensive coverage of the construct while maintaining clarity, feasibility, and suitability for field administration.

Pilot Testing

The test prepared with detailed instruction on the mode of answering was administered to a sample of 15 Teachers from primary, upper primary and high school each so as to get feedback about the clarity in the instructions given, the easiness in

comprehending the items given and other factors related to the test. Based on these feedbacks the researcher did the final selection for the draft tool with necessary modification. For the draft tool 36 questions were finalized. A copy of the draft of Teachers Relationship with Children is attached in Appendix.

Mode of Answering

The Teachers have to read the questions carefully and fill the appropriate answers in the space provided along with the questions itself.

Scoring Procedure

The 36 structured items in Part A were scored using the following scale:

- **Constantly** = 3 points
- **Occasionally** = 2 points
- **Not at all** = 1 point

Each teacher's responses were tallied to compute a total score, representing the overall level of engagement in relationship-building and child-supportive practices. Higher scores indicate stronger and more consistent teacher-child interactions.

Dimension-wise scoring helps identify specific areas of strength and those requiring improvement. The open-ended responses in Part B were not scored numerically; instead, they were analysed thematically as part of the qualitative analysis.

Try out

The test was carried out on a sample of 30 Teachers drawn by random sampling. The responses obtained were scored and were employed for further computation

Item Analysis

The responses of the teachers were collected and coded as per the answer key. The items were then subjected to item analysis to test which items are to be included in the final tool. The data were arranged in ascending order of the total score. 27 per cent data from the uppermost and lowermost were selected. An independent sample t test was employed to do the item analysis. Table 4 shows the result of item analysis of the Teachers Relationship with children of the School Students.

Table 4

Result of the Item Analysis of Teachers Relationship with children

Item No.	t-value	Status	Item No.	t-value	Status
1	7.000**	Accepted	30	2.680**	Accepted
2	2.556*	Accepted	31	3.542**	Accepted
3	4.565**	Accepted	32	8.573**	Accepted
4	3.456**	Accepted	33	6.943**	Accepted
5	8.941**	Accepted	34	5.072**	Accepted
6	4.698**	Accepted	35	4.000**	Accepted
7	1.043	Rejected	36	9.956**	Accepted
8	2.671**	Accepted	37	0.014	Rejected
9	4.146**	Accepted	38	0.656	Rejected
10	6.368**	Accepted	39	0.708	Rejected
11	2.739**	Accepted	40	3.280**	Accepted
12	6.205**	Accepted	41	7.014**	Accepted
13	1.407	Rejected	42	0.656	Rejected

14	1.86	Rejected	43	0.708	Rejected
15	3.649**	Accepted	44	3.280**	Accepted
16	7.584**	Accepted	45	3.552**	Accepted
17	9.227**	Accepted	46	1.016	Rejected
18	0.089	Rejected	47	2.680**	Accepted
19	4.583**	Accepted	48	3.542**	Accepted
20	2.526*	Accepted	49	0.014	Rejected
21	8.775**	Accepted	50	0.656	Rejected
22	1.429	Rejected	51	0.708	Rejected
23	10.896**	Accepted	52	1.016	Rejected
24	5.563**	Accepted	53	1.043	Rejected
25	2.824**	Accepted	54	1.407	Rejected
26	2.064*	Accepted	55	1.86	Rejected
27	6.822**	Accepted	56	0.089	Rejected
28	3.552**	Accepted	57	1.429	Rejected
29	1.016	Rejected	58	1.016	Rejected

**Note.* * Denotes significant at .05 level of confidence.

** denotes significant at .01 level of significance.

Preparation of the Final Tool

After the item analysis 8 items out of 36 were found to be unable to discriminate the difference. Hence those 22 items were removed and the final test consisted of 36 items. Dimension-wise analysis of the test items is given in Table 5.

Table 5

Dimension-Wise Analysis of the teacher's relationship with children is given below

Part / Dimension	Description of Content	Number of Items
Part A: Structured Items	Measures frequency of teacher practices related to record keeping, support strategies, creative development, parental involvement, experiential learning, equity, and ICT.	15 items
Dimension 1: Record Keeping & Monitoring	Covers documentation of student personal details, progress tracking, and monitoring mechanisms.	3 items
Dimension 2: Individualized Attention & Inclusion	Focuses on identification of children needing support, remedial strategies, and inclusion of diverse learners.	3 items
Dimension 3: Holistic Development	Encompasses creative arts, sports, cultural activities, and opportunities for talent development.	3 items
Dimension 4: Parent– Teacher Collaboration	Explores communication methods, collaboration frequency, and parent engagement practices.	3 items
Dimension 5: Experiential Learning	Includes field trips, hands-on learning, play-based learning, and project-based approaches.	3 items
Dimension 6: Access & Equity	Covers support for disadvantaged students, equal learning opportunities, and anti-discriminatory practices.	3 items

Part / Dimension	Description of Content	Number of Items
Dimension 7: ICT Integration	Focuses on technology use in teaching, digital resources, and ICT-based assessments.	3 items
Part B: Open- Ended Questions	Captures teachers' reflections, experiences, and examples under each dimension.	21 questions
Total	Complete tool consisting of structured and open-ended items.	36 items

A copy of the final tool is given in Appendix

Validity and Reliability of the Tool

Content validation was carried out with the support of an expert panel comprising professionals in education, child psychology, teacher training, and research methodology. The experts reviewed each item for its alignment with the study objectives, conceptual clarity, language simplicity, and appropriateness for teachers working in the selected context. Content validity was established for the life skill test. The researcher also established face validity for the test also Content Validity and Intrinsic Validity is 0.9539

Reliability testing was undertaken to determine the internal consistency of the developed tool. The final 36-item scale was pilot-tested among a small sample of teachers who were not part of the main study. Responses were coded and analyzed using reliability statistics. Cronbach's alpha coefficient was calculated to assess internal consistency across the multiple dimensions of the tool. To check the reliability

of the test, Cronbach alpha was employed. The value of Cronbach alpha is 0.739 which shows that the test is highly reliable.

Learning Quality of Children

Learning Quality Assessment Tool for Measuring the Learning Quality of Children

The development and standardization of the **Learning Quality Assessment Tool (LQAT)** for evaluating the overall learning quality of children at the higher secondary level involves a systematic and scientific procedure. The Learning Quality of children reflects their competencies in literacy, comprehension, writing ability, conceptual understanding, and creative expression. To ensure that the tool is valid, reliable, and suitable for educational assessment, the following major steps were followed in its construction and standardization:

- Planning of the Tool
- Preparation of the Tool
- Mode of Answering
- Scoring Procedure
- Try-Out
- Item Analysis
- Preparation of the Final Tool

Each stage contributes to the rigor and accuracy of the scale, ensuring that it effectively measures the various dimensions of children's learning quality. These dimensions include foundational literacy skills, comprehension, problem-solving ability, written communication, and creative thinking. The tool thus serves as a

comprehensive instrument for understanding and evaluating the learning outcomes of students in an objective manner.

Planning of the Tool

To create a tool for assessing the Learning Quality of Children, it is essential to focus on the core areas that reflect how well students understand, process, and express their learning. This tool examines children's abilities in literacy, comprehension, writing, and creative expression, capturing both foundational skills and higher-order thinking. It helps determine the depth, clarity, and originality of students' learning outcomes.

Learning Quality of Children — Key Dimensions

This section evaluates students' literacy, comprehension, writing, and creative expression. The following Table 6. shows conceptual dimensions emerge:

Table 6*Conceptual dimensions of Learning Quality of Children*

Dimension	Core Focus	Related Items (Question Nos.)	Description
1. Language Proficiency and Multilingual Skills	Mastery in different languages	Q1, Q14, Q15, Q16	Assesses ability to read/write in Malayalam, English, and Hindi (and Tamil regionally).
2. Reading Comprehension and Literacy Skills	Understanding and interpreting texts	Q5, Q6, Q11, Q12, Q13	Evaluates reading fluency, comprehension, and engagement with reading materials like newspapers and library books.
3. Writing and Expressive Skills	Writing ability, structure, and creativity	Q2, Q7, Q9, Q10	Focuses on sentence formation, idea expression, and ability to write about personal experiences.
4. Intervention and Remediation Needs	Addressing learning difficulties	Q3, Q4	Identifies children requiring short-term or prolonged educational support.
5. Reading and Writing Habits	Sustained engagement with reading and learning	Q8, Q12, Q13	Examines habits of self-motivated reading and recording ideas from texts.
6. Foundational Literacy (Alphabet and Basic Skills)	Mastery of alphabets and basic literacy	Q9, Q14, Q15, Q16	Checks whether students can correctly identify, read, and write alphabet sequences.

Preparation of the Tool:

The development of the *Learning Quality of Children (LQC)* tool involved several systematic steps to ensure that the instrument was comprehensive, contextually appropriate, and aligned with the study objectives. Initially, an extensive pool of questions was prepared based on a review of relevant literature, classroom observations, discussions with teachers at Attappadi, and an examination of curricular expectations related to children's language, reading, writing, and learning behaviours.

The preliminary collection included items addressing multiple aspects of learning quality, such as language proficiency, reading comprehension, writing ability, reading habits, and the need for academic intervention. Each item was evaluated for clarity, relevance, and its potential to capture meaningful information about children's learning characteristics. Redundant or conceptually overlapping questions were removed, and several items were revised for linguistic simplicity and contextual suitability.

After expert review and item refinement, the final tool comprised 4 questions in Part A and 12 questions in Part B, organized across key dimensions such as language proficiency, reading comprehension, writing and expressive skills, intervention needs, and reading habits. The combination of structured and descriptive items ensured that the tool provided both measurable indicators and rich qualitative information on the learning quality of children in Attappadi.

Pilot Testing

The test prepared with detailed instruction on the mode of answering was administered to a sample of 15 students from upper primary so as to get feedback about the clarity in the instructions given, the easiness in comprehending the items given and other factors related to the test. Based on this feedback, the researcher made the final selection for the draft tool with the necessary modifications. For Draft tool 16 questions were finalised. A copy of the draft of Learning Quality with Children is attached in Appendix.

Mode of Answering

The Learning Quality of Children (LQC) Tool contains two parts, each requiring a different form of response.

Part A: Structured Questions

Part A contains four structured questions intended to assess key indicators of children's learning quality. Teachers were asked to respond by selecting the most appropriate option, such as:

- Yes / No, or
- Language-specific ability categories (Malayalam, English, Hindi, Tamil)

Respondents indicated their answers by placing a tick (✓) against the option that best described the children's learning behaviour. These responses were later converted into numerical values for analysis.

Part B: Open-Ended Questions

Part B includes twelve open-ended questions distributed across six learning dimensions. Teachers were instructed to provide descriptive answers based on their observations and classroom experience. They were encouraged to write short, clear, and contextually relevant explanations or examples.

Scoring Procedure

Part A: Structured Questions

Part A uses categorical answers (YES/NO or ability-based options). For scoring:

- Favourable/Positive response = 1
- Negative/Absent response = 0

Total Part A score ranges from **0 to 4**, which is given in Table 7

Table 7

Score Range and Interpretations

Score Range	Interpretation
3–4	High Learning Quality Indicators
2	Moderate Learning Quality Indicators
0–1	Low Learning Quality Indicators

There were no fixed options; teachers could respond freely to describe students' learning characteristics, intervention needs, reading habits, and language skills.

Part B: Open-Ended Questions

Part B responses are not numerically scored. They are analyzed using thematic analysis across the six dimensions:

1. Language Proficiency
2. Reading Comprehension
3. Writing & Expressive Skills
4. Intervention Needs
5. Reading Habits
6. Overall Learning Behaviour

Themes are coded, categorized, and interpreted to provide qualitative insights.

Try out

The test was carried out on a sample of 120 students drawn by random sampling. The responses obtained were scored and were employed for further computation

Item Analysis

Item analysis was conducted to determine the discriminatory power of each item. The t-test discrimination method was used by comparing scores between the upper and lower 27% of respondents.

Items with t-values ≥ 1.96 ($p < .05$) were accepted, while items below the threshold were rejected.

- Total items analyzed: 28

- Items accepted: 16

Part A: 4 accepted items

Part B: 12 accepted items

- Items rejected: 12

Rejected items were eliminated because they lacked clarity, discriminatory power, or relevance to the construct. Summary of Item analysis is Given in Table 8

Table 8

Summary of Item Analysis

Component	Total Items	Accepted	Rejected
Part A	4	4	0
Part B	24	12	12
Total	28	16	12

The accepted items together formed the final version of the LQC tool.

Scoring Procedure

Part B responses are not numerically scored. They are analyzed using thematic analysis

Item Analysis

The responses of the primary students were collected and coded as per the answer key. The items were then subjected to item analysis to test which items are to be included in the final tool. The result from the Item analysis is given in Table 9.

Table 9

Result from the Item analysis

Item No.	<i>t</i>	Status	Item No.	<i>t</i>	Status
Item No. 1	2.898**	Accepted	Item No. 15	7.668**	Accepted
Item No. 2	4.320**	Accepted	Item No. 16	8.226**	Accepted
Item No. 3	1.795	Rejected	Item No. 17	3.921**	Accepted
Item No. 4	4.583**	Accepted	Item No. 18	7.897**	Accepted
Item No. 5	1.429	Rejected	Item No. 19	1.795	Rejected
Item No. 6	1.429	Rejected	Item No. 20	1.429	Rejected
Item No. 7	5.821**	Accepted	Item No. 21	1.429	Rejected
Item No. 8	6.199*	Accepted	Item No. 22	3.934**	Accepted
Item No. 9	1.476	Rejected	Item No. 23	1.429	Rejected
Item No. 10	6.205**	Accepted	Item No. 24	3.921**	Accepted
Item No. 11	1.429	Rejected	Item No. 25	4.583**	Accepted
Item No. 12	1.429	Rejected	Item No. 26	10.027**	Accepted
Item No. 13	7.581**	Accepted	Item No. 27	1.429	Rejected
Item No. 14	1.429	Rejected	Item No. 28	3.055**	Accepted

*Note. * denotes significant at .05 level of confidence.

** denotes significant at .01 level of significance.

Preparation of the Final Tool

After the item analysis out of 28 were found to be unable to discriminate the difference. Hence those 12 items were removed and the final test consisted of 28 items. Dimension-wise analysis of the test items is given in Table 10.

Table 10*Dimension-wise analysis of the test items*

Component	Total Items	Accepted	Rejected
Part A	4	4	0
Part B	24	12	12
Total	28	16	12

A copy of the final tool is given in Appendix

Validity and Reliability of the Tool

Content validity was established for the life skill test. The researcher also established face validity for the test. Experts assessed each item for relevance, clarity, accessibility, cultural sensitivity, and appropriateness for the targeted primary school context.

To check the reliability of the test, Cronbach alpha was employed. The value of Cronbach alpha is 0.939 which shows that the test is highly reliable. The reliability coefficient indicated a satisfactory level of internal consistency, demonstrating that the items measured the construct in a stable and dependable manner. Reliability of qualitative analysis was ensured through coding consistency, expert cross-checking, and thematic verification.” The Cronbach alpha is 0.745

Life Skill Assessment Test

In this study, the researcher collected life skill scores by developing and validating a life skill assessment test for lower primary, upper primary and high school students of Attappadi separately. The procedure is discussed further. In order to create a Life skills assessment, the theoretical dimensions of the Tool were reviewed.

Theoretical Dimensions of Life Skills

Life skills refer to a set of psychosocial competencies that enable individuals to effectively manage challenges, communicate, make decisions, and interact constructively with their environment. According to the World Health Organization (WHO, 1997) and UNICEF (2012), life skills can be organized into broad theoretical dimensions that reflect cognitive, social, and emotional competencies. These dimensions form the conceptual foundation for developing life skill assessment tools in educational and developmental research.

Life skills are commonly categorized into three overarching theoretical domains:

1. Cognitive (Thinking) Skills
2. Social (Interpersonal) Skills
3. Emotional (Coping and Self-Management) Skills

These domains collectively support holistic development and align with internationally accepted frameworks for competencies required in daily life,

schooling, and 21st-century learning. The theoretical dimensions are given in Table 11.

Table 11

Theoretical Dimensions of Life Skills and Their Key Components

Life Skill Dimension	Sub-Skills / Key Components	Explanation
1. Cognitive Skills	Decision-making • Problem-solving • Creative thinking	Cognitive life skills enable individuals to process information, analyze situations, generate solutions, and make reasoned decisions.
	Critical thinking	They support academic achievement and adaptive behaviour in real-life contexts.
2. Social / Interpersonal Skills	• Effective communication • Interpersonal relationship skills • Negotiation skills	Social skills help individuals interact positively with peers and adults, build supportive relationships, prevent conflicts, and understand others' emotions. These skills enhance collaboration and social adaptation.
	• Empathy	
3. Emotional / Coping Skills	• Self-awareness • Managing emotions • Coping with stress	Emotional skills allow individuals to recognize their own feelings, regulate emotions, manage stress effectively, and develop resilience.
	• Resilience	These are essential for mental health and positive personal development.

Cognitive Life Skills

Cognitive skills form the foundation of rational behavior and academic functioning. Decision-making and problem-solving guide individuals in identifying options, assessing consequences, and choosing appropriate actions. Critical and creative thinking support analytical reasoning, innovation, and the ability to challenge assumptions (UNICEF, 2012).

Social / Interpersonal Life Skills

These skills promote healthy social functioning. Communication enables expressing thoughts clearly, while interpersonal relationship skills strengthen cooperation and conflict prevention. Empathy—understanding and responding to others' feelings—is central to prosocial behavior and inclusive learning environments (WHO, 1997).

Emotional / Coping Skills

Emotional skills build personal resilience and support psychological well-being. Self-awareness helps individuals recognize their strengths and weaknesses, while emotional regulation prevents impulsive reactions. Coping with stress and managing difficult emotions are crucial for academic persistence and adaptive behaviour (Nasheeda et al., 2019).

After obtaining these theoretical dimensions some of the previous tools were also reviewed and the details are presented in Table 12.

Table 12*Theoretical domains Life Skills and Their Key Components in the reference year*

Tool Name	Key Dimensions / Domains	Reference (Year)
Life Skills Survey Tool (LiSST)	Positive Mindset, Interpersonal Skills, Higher Order Thinking, Community Mindset	IYF Global (2021)
Life Skills Assessment (TransCen, Inc.)	Independence, Home, Community, Social Competencies	NDS Australia (no year found)
Life Skills Inventory: Independent Living Skills	Money Management, Food Management, Personal Hygiene, Health, Housekeeping, Housing, Transport	Elmbrook Schools (2000)
Life Skills Assessment Tool (LSA)	Understanding Self, Relationship Skills, Higher Order Thinking, Entrepreneurship, Employability, Commitment to Education, Growth Mindset	Save the Children US (2023)
Life Skills Measurement Tool (Elementary Stage)	Cognitive (Critical Thinking, Decision Making, Problem Solving, Creativity), Personal (Participation, Resilience), Interpersonal (Negotiation, Empathy, Communication)	Young Lives India (2020)
Life Skills Assessment Scale	Initiative, Interaction, Problem Solving, Conflict Management, Following Instructions	Hundred.org (2014)
LSMT-S (Secondary Stage)	Based on UNICEF Life Skills Framework: Covers ten core skills, e.g., Empathy, Negotiation, Resilience, Communication, Participation, among others WHO Ten Core Life Skills: Self-Awareness, Empathy, Interpersonal Relationships, Communication, Critical Thinking, Creative Thinking, Decision Making, Problem Solving, Coping with Emotions, Coping with Stress	Young Lives India (2020-2021)
Life Skills Assessment Scale (LSAS)		IOSR Journals (no year found)
Tool Name	Key Dimensions / Domains	Reference (Year)

Tool Name	Key Dimensions / Domains	Reference (Year)
Life Skills Survey Tool (LiSST)	Positive Mindset, Interpersonal Skills, Higher Order Thinking, Community Mindset	IYF Global iyfglobal (2021)
Life Skills Assessment (TransCen, Inc.)	Independence, Home, Community, Social Competencies	NDS Australia nds (no year found)
Life Skills Inventory: Independent Living Skills	Money Management, Food Management, Personal Hygiene, Health, Housekeeping, Housing, Transport	Elmbrook Schools elmbrookscho ols (2000)
Life Skills Assessment Tool (LSA)	Understanding Self, Relationship Skills, Higher Order Thinking, Entrepreneurship, Employability, Commitment to Education, Growth Mindset	Save the Children US resourcecentr e.savethechil dren (2023)
Life Skills Measurement Tool (Elementary Stage)	Cognitive (Critical Thinking, Decision Making, Problem Solving, Creativity), Personal (Participation, Resilience), Interpersonal (Negotiation, Empathy, Communication)	Young Lives India younglives (2020)
Life Skills Assessment Scale	Initiative, Interaction, Problem Solving, Conflict Management, Following Instructions	Hundred.org hundred (2014)
LSMT-S (Secondary Stage)	Based on UNICEF Life Skills Framework: Covers ten core skills, e.g., Empathy, Negotiation, Resilience, Communication, Participation, among others	Young Lives India younglives (2020-2021)
Life Skills Assessment Scale (LSAS)	WHO Ten Core Life Skills: Self-Awareness, Empathy, Interpersonal Relationships, Communication, Critical Thinking, Creative Thinking, Decision Making, Problem Solving, Coping with Emotions, Coping with Stress	IOSR Journals iosrjournals (no year found)
Life Skills Survey Tool (LiSST)	Positive Mindset, Interpersonal Skills, Higher Order Thinking, Community Mindset	IYF Global
Life Skills Assessment (TransCen, Inc.)	Independence, Home, Community, Social Competencies	NDS Australia

Tool Name	Key Dimensions / Domains	Reference (Year)
Life Skills Inventory: Independent Living Skills	Money Management, Food Management, Personal Hygiene, Health, Housekeeping, Housing, Transport	Elmbrook Schools
Life Skills Assessment Tool (LSA)	Understanding Self, Relationship Skills, Higher Order Thinking, Entrepreneurship, Employability, Commitment to Education, Growth Mindset	Save the Children US
Life Skills Measurement Tool (Elementary Stage)	Cognitive (Critical Thinking, Decision Making, Problem Solving, Creativity), Personal (Participation, Resilience), Interpersonal (Negotiation, Empathy, Communication)	Young Lives India
Life Skills Assessment Scale	Initiative, Interaction, Problem Solving, Conflict Management, Following Instructions Based on UNICEF Life Skills Framework:	Hundred.org
LSMT-S (Secondary Stage)	Covers ten core skills, e.g., Empathy, Negotiation, Resilience, Communication, Participation, among others	Young Lives India
Life Skills Assessment Scale (LSAS)	WHO Ten Core Life Skills: Self-Awareness, Empathy, Interpersonal Relationships, Communication, Critical Thinking, Creative Thinking, Decision Making, Problem Solving, Coping with Emotions, Coping with Stress	IOSR Journals

After this analysis the dimensions were studied and selected the following most relevant dimensions of life skill for our study as follows Critical thinking, creative thinking and problem solving and they were selected as dimensions of the tool.

Preparation of the Test

A pool of questions was prepared. From the pool of questions 50 questions were selected to make the tool.

The following section outlines the key dimensions of life skills identified for this study, supported by example assessment items and concise explanations of each

construct. These dimensions—derived from established frameworks such as WHO (1999) and UNICEF (2012)—were selected for their relevance to learners’ cognitive development and their importance in life skills education. Together, they offer a structured foundation for designing appropriate assessment items aligned with the study’s objectives, as summarized in Table 13.

Table 13

Dimensions of Life Skills with Example Assessment Items and Explanations

Life Skill Dimension	Example Items / Sample Questions	Explanation of the Dimension
Critical Thinking	• I examine information carefully before accepting it as true. • I compare different viewpoints before making a judgment. • I try to identify assumptions or biases in what I read or hear.	Critical thinking involves the ability to analyze information objectively, evaluate evidence, identify underlying assumptions, and make well-reasoned judgments. It supports informed decision-making and prevents impulsive or biased interpretations of situations.
Creative Thinking	• I can think of many different ways to solve a problem. • I enjoy trying new or unusual ideas when faced with a challenge. • I combine ideas from different sources to create something new.	Creative thinking refers to generating novel, original, and useful ideas. It involves imagination, flexibility, and the ability to see situations from new perspectives. Creativity supports innovation and helps individuals navigate new or unfamiliar challenges.
Problem Solving	• I can identify the main cause of a problem. • I break a complex problem into smaller steps to find a solution. • I evaluate different possible solutions before choosing one.	Problem solving is the ability to recognize a problem, analyze its components, generate alternative solutions, choose the most appropriate one, and evaluate the outcome. It enables individuals to overcome obstacles and manage real-life situations effectively.

Table 13 presents the three selected dimensions of life skills—critical thinking, creative thinking, and problem solving—used for constructing the life skill assessment tool. For each dimension, the table provides three sample items that can be adapted to Likert-type statements during tool development. These items reflect observable behavioral tendencies associated with each skill. The explanations clarify the theoretical meaning of each dimension and justify why they are included in the instrument. This table serves as the foundation for item generation, ensuring that each dimension is clearly conceptualized and operationalized before further validation steps.

Life Skill Assessment Test for Primary School Students

The life skill assessment test for primary school students was developed after going through their curriculum too.

Planning of the Test

The investigator discussed with the guide and other subject experts on collecting the data on life skills of learners of Attappadi. After the discussion and studying the prior researchers, it was decided to prepare a test to assess selected dimensions of life skill.

Pilot Testing

The test prepared with detailed instruction on the mode of answering was administered to a sample of 15 students from primary, upper primary and high school each so as to get feedback about the clarity in the instructions given, the easiness in

comprehending the items given and other factors related to the test. Based on these feedbacks the researcher did the final selection for the draft tool with necessary modification. For the draft tool 40 questions were finalized. A copy of the draft of Life Skill Assessment Test is attached in Appendix.

Mode of Answering

The students have to read the questions carefully and fill the appropriate answers in the space provided along with the questions itself.

Scoring Procedure

Answer key was prepared for the prepared test items. Wrong answers carry 0 marks. For the right answers scoring was done as per the scoring key. The copy of the Answer sheet is attached in the Appendix.

Try out

The test was carried out on a sample of 120 students drawn by random sampling. The responses obtained were scored and were employed for further computation

Item Analysis

The responses of the primary students were collected and coded as per the answer key. The items were then subjected to item analysis to test which items are to be included in the final tool. The data were arranged in ascending order of the total score. 27 per cent data from the uppermost and lowermost were selected. An

independent sample t test was employed to do the item analysis. Table 14 shows the result of item analysis of the Life Skill Assessment Test for Primary School Students.

Table 14

Result of Item Analysis Life Skill Assessment Test for Primary School Students.

Item No.	<i>t</i>	Status	Item No.	<i>t</i>	Status
Item No. 1	7.000**	Accepted	Item No. 21	8.775**	Accepted
Item No. 2	2.556*	Accepted	Item No. 22	1.429	Rejected
Item No. 3	4.565**	Accepted	Item No. 23	10.896**	Accepted
Item No. 4	3.456**	Accepted	Item No. 24	5.563**	Accepted
Item No. 5	8.941**	Accepted	Item No. 25	2.824**	Accepted
Item No. 6	4.698**	Accepted	Item No. 26	2.064*	Accepted
Item No. 7	1.043	Rejected	Item No. 27	6.822**	Accepted
Item No. 8	2.671**	Accepted	Item No. 28	3.552**	Accepted
Item No. 9	4.146**	Accepted	Item No. 29	1.016	Rejected
Item No. 10	6.368**	Accepted	Item No. 30	2.680**	Accepted
Item No. 11	2.739**	Accepted	Item No. 31	3.542**	Accepted
Item No. 12	6.205**	Accepted	Item No. 32	8.573**	Accepted
Item No. 13	1.407	Rejected	Item No. 33	6.943**	Accepted
Item No. 14	1.86	Rejected	Item No. 34	5.072**	Accepted
Item No. 15	3.649**	Accepted	Item No. 35	4.000**	Accepted
Item No. 16	7.584**	Accepted	Item No. 36	9.956**	Accepted
Item No. 17	9.227**	Accepted	Item No. 37	7.014**	Accepted
Item No. 18	0.089	Rejected	Item No. 38	0.656	Rejected
Item No. 19	4.583**	Accepted	Item No. 39	0.708	Rejected
Item No. 20	2.526*	Accepted	Item No. 40	3.280**	Accepted

*Note. * denotes significant at .05 level of confidence.

** denotes significant at .01 level of significance.

Preparation of the Final Tool

After the item analysis 8 items out of 40 were found to be unable to discriminate the difference. Hence those 8 items were removed and the final test consisted of 32 items. Dimension-wise analysis of the test items is given in Table 15.

Table 15

Dimension-Wise Analysis of the Life Skill Assessment Test for Students From Tribal Communities of Primary Schools of Attappadi

Dimension	Question No.	Number of Items
Problem Solving Skill	1,7,9,10,14,16,17,18, 19,20,27,31	12
Critical Thinking Ability	2,3,5,11,12,13,15,21,22, 23,24,25,26,28,30,32	16
Creative Thinking Ability	4,6,8,29	4
Total number of questions in Life Skill Assessment Test		32

A copy of the final tool is given in Appendix.

Validity and Reliability of the Tool

Content validity was established for the life skill test. The researcher also established face validity for the test.

To check the reliability of the test, Cronbach alpha was employed. The value of Cronbach alpha is 0.839 which shows that the test is highly reliable.

Life Skill Assessment Test for Upper Primary School Students

The life skill assessment test for upper primary school students was developed after going through KCF (2023) and NCF, National Policy on Education (2020) and the upper primary school curriculum and textbook.

Planning of the Test

The investigator discussed with the guide and other subject experts on collecting the data on life skills of learners of Attappadi. After the discussion and studying of the prior researchers, it was decided to prepare a test to assess life skill. Critical thinking, creative thinking and problem solving were selected as dimensions of the tool.

Preparation of the Test

A pool of questions was prepared. From the pool of questions 50 questions were selected to make the tool.

Pilot Testing

The test prepared with detailed instruction on the mode of answering was administered to a sample of 15 students from upper primary so as to get feedback about the clarity in the instructions given, the easiness in comprehending the items given and other factors related to the test. Based on these feedbacks the researcher did the final selection for the draft tool with necessary modification. For the draft tool 40 questions were finalized. A copy of the draft of Life Skill Assessment Test is attached in Appendix.

Mode of Answering

The students have to read the questions carefully and fill the appropriate answers in the space provided along with the questions itself.

Scoring Procedure

Answer key was prepared for the prepared test items. Wrong answers carry 0 marks. For the right answers scoring was done as per the scoring key.

Try out

The test was carried out on a sample of 120 students drawn by random sampling. The responses obtained were scored and were employed for further computation

Item Analysis

The responses of the primary students were collected and coded as per the answer key. The items were then subjected to item analysis to test which items are to be included in the final tool. The data were arranged in ascending order of the total score. 27 per cent data from the uppermost and lowermost were selected. An independent sample t test was employed to do the item analysis. Table 16 shows the result of item analysis of the Life Skill Assessment Test for Upper Primary School Students.

Table 16

Result of Item Analysis of the Life skill Assessment Test for Upper Primary School Students.

Item No.	<i>t</i>	Status	Item No.	<i>t</i>	Status
Item No. 1	2.898**	Accepted	Item No. 21	9.800*	Accepted
Item No. 2	4.320**	Accepted	Item No. 22	3.934**	Accepted
Item No. 3	3.874**	Accepted	Item No. 23	7.897**	Accepted
Item No. 4	4.583**	Accepted	Item No. 24	3.921**	Accepted
Item No. 5	4.149**	Accepted	Item No. 25	4.583**	Accepted
Item No. 6	2.333*	Accepted	Item No. 26	10.027**	Accepted
Item No. 7	5.821**	Accepted	Item No. 27	2.907**	Accepted
Item No. 8	6.199*	Accepted	Item No. 28	3.055**	Accepted
Item No. 9	1.476	Rejected	Item No. 29	3.147**	Accepted
Item No. 10	6.205**	Accepted	Item No. 30	9.934**	Accepted
Item No. 11	9.753**	Accepted	Item No. 31	5.564**	Accepted
Item No. 12	7.110**	Accepted	Item No. 32	5.480**	Accepted
Item No. 13	7.581**	Accepted	Item No. 33	12.803**	Accepted
Item No. 14	5.909**	Accepted	Item No. 34	1.75	Rejected
Item No. 15	7.668**	Accepted	Item No. 35	2.585*	Accepted
Item No. 16	8.226**	Accepted	Item No. 36	9.956**	Accepted
Item No. 17	3.921**	Accepted	Item No. 37	0.929	Rejected
Item No. 18	7.897**	Accepted	Item No. 38	7.089**	Accepted
Item No. 19	1.795	Rejected	Item No. 39	5.982**	Accepted
Item No. 20	1.429	Rejected	Item No. 40	11.659**	Accepted

*Note. * denotes significant at .05 level of confidence.

** denotes significant at .01 level of significance.

Preparation of the Final Tool

After the item analysis 5 items out of 40 were found to be unable to discriminate the difference. Hence those 8 items were removed and the final test consisted of 35 items. Dimension-wise analysis of the test items is given in Table 17.

Table 17

Dimension-Wise Analysis of the Life Skill Assessment Test for Students From Tribal Communities of Upper Primary Schools of Attappadi

Dimension	Question No.	Number of Items
Problem Solving Skill	1, 3,6,11,12,13,14,15,16,30,31,	11
Critical Thinking Ability	2,5,9,10,17,19,20,21,25,26,27, 28,29,33,34	15
Creative Thinking Ability	4,7,8,18,22,23,24,32, 35	9
Total number of questions in Life Skill Assessment Test		35

A copy of the final tool is given in Appendix .

Validity and Reliability of the Tool

Content validity was established for the life skill test. The researcher also established face validity for the test.

To check the reliability of the test, Cronbach alpha was employed. The value of Cronbach alpha is 0.939 which shows that the test is highly reliable.

Life Skill Assessment Test for High School Students

The life skill assessment test for high school students was developed after going through their curriculum too.

Planning of the Test

The investigator discussed with the guide and other subject experts on collecting the data on life skills of learners of Attappadi. After the discussion and studying of the prior researchers, it was decided to prepare a test to assess life skill. Critical thinking, creative thinking and problem solving were selected as dimensions of the tool.

Preparation of the Test

A pool of questions was prepared. From the pool of questions 50 questions were selected to make the tool.

Pilot Testing

The test, prepared with detailed instruction on the mode of answering was administered to a sample of 15 students from high school so as to get feedback about the clarity in the instructions given, the easiness in comprehending the items given and other factors related to the test. Based on these feedbacks the researcher did the final selection for the draft tool with necessary modification. For the draft tool 40 questions were finalized. A copy of the draft of Life Skill Assessment Test is attached in Appendix.

Mode of Answering

The students have to read the questions carefully and fill the appropriate answers in the space provided along with the questions itself.

Scoring Procedure

Answer key was prepared for the prepared test items. Wrong answers carry 0 mark. For the right answers scoring was done as per the scoring key.

Try out

The test was carried out on a sample of 120 students drawn by random sampling. The responses obtained were scored and were employed for further computation

Item Analysis

The responses of the high school students were collected and coded as per the answer key. The items were then subjected to item analysis to test which items are to be included in the final tool. The data were arranged in ascending order of the total score. 27 per cent data from the uppermost and lowermost were selected. An independent sample t test was employed to do the item analysis. Table 18 shows the result of item analysis of the Life Skill Assessment Test for High School Students.

Table 18

The result of the item analysis of the life skill assessment test for high school students. Result of Item Analysis of the Life Skill Assessment Test for High School Students.

Item No.	<i>t</i>	Status	Item No.	<i>t</i>	Status
Item No. 1	7.000**	Accepted	Item No. 21	8.775**	Accepted
Item No. 2	2.556*	Accepted	Item No. 22	1.429	Rejected
Item No. 3	4.565**	Accepted	Item No. 23	10.896**	Accepted
Item No. 4	3.456**	Accepted	Item No. 24	5.563**	Accepted
Item No. 5	8.941**	Accepted	Item No. 25	2.824**	Accepted
Item No. 6	4.698**	Accepted	Item No. 26	2.064*	Accepted
Item No. 7	1.043	Rejected	Item No. 27	6.822**	Accepted
Item No. 8	2.671**	Accepted	Item No. 28	3.552**	Accepted
Item No. 9	4.146**	Accepted	Item No. 29	1.016	Rejected
Item No. 10	6.368**	Accepted	Item No. 30	2.680**	Accepted
Item No. 11	2.739**	Accepted	Item No. 31	3.542**	Accepted
Item No. 12	6.205**	Accepted	Item No. 32	8.573**	Accepted
Item No. 13	1.407	Rejected	Item No. 33	6.943**	Accepted
Item No. 14	1.86	Rejected	Item No. 34	5.072**	Accepted
Item No. 15	3.649**	Accepted	Item No. 35	4.000**	Accepted
Item No. 16	7.584**	Accepted	Item No. 36	9.956**	Accepted
Item No. 17	9.227**	Accepted	Item No. 37	7.014**	Accepted
Item No. 18	0.089	Rejected	Item No. 38	0.656	Rejected
Item No. 19	4.583**	Accepted	Item No. 39	0.708	Rejected
Item No. 20	2.526*	Accepted	Item No. 40	3.280**	Accepted

*Note. * denotes significant at .05 level of confidence.

** denotes significant at .01 level of significance.

Preparation of the Final Tool

After the item analysis 8 items out of 40 were found to be unable to discriminate the difference. Hence those 8 items were removed and the final test consisted of 32 items. Dimension-wise analysis of the test items is given in Table 19.

Table 19

Dimension-Wise Analysis of the Life Skill Assessment Test for Students From Tribal Communities of High Schools of Attappadi

Dimension	Question No.	Number of Items
Problem Solving Skill	1,5,7,9,10,13,16,17,18,19,20,28,29,30,31	15
Critical Thinking Ability	3,4,6,11,14,22,24,26,32	9
Creative Thinking Ability	2,7,8,12,15,21,23,25,27,33	10
Total number of questions in Life Skill Assessment Test		34

A copy of the final tool is given in Appendix.

Validity and Reliability of the Tool

Content validity was established for the life skill test. The researcher also established face validity for the test.

To check the reliability of the test, Cronbach alpha was employed. The value of Cronbach alpha is 0.939 which shows that the test is highly reliable.

Interview Schedule

To gain insights into the shifts within the education sector from the viewpoints of parents, elected officials, and other significant stakeholders, an open-ended interview guide was created. This qualitative instrument was intended to gather a range of perspectives, experiences, and insights concerning educational advancements in the Attappadi region. The questions included in the guide were thoughtfully designed according to the indicator framework of Sustainable Development Goal 4 (SDG 4), which emphasizes the importance of providing inclusive and equitable quality education and fostering lifelong learning opportunities for everyone. By aligning the questions with the indicators of SDG 4, the guide allowed the researcher to evaluate not only overall perceptions but also particular elements related to the local attainment of this goal. This strategy ensured that the data collected would offer comprehensive, context-specific insights into the progress, shortcomings, and obstacles to achieving quality education in Attappadi, particularly for marginalized and tribal communities.

Statistical Techniques Used for the Study

The following statistical techniques will be used for the analysis of the data:

- Preliminary statistics like mean, median, mode, standard deviation, skewness and kurtosis for testing the normality of the collected data
- Independent sample t-Test,
- Repeated measures of ANOVA
- Test of Sphericity (Mauchly's W)
- Greenhouse–Geisser Correction

- Huynh–Feldt Correction
- QQ Plot
- Normality Test
- Repeated Measures ANOVA
- Bonferroni Post Hoc Test
- Adjusted Post-Test Scores
- Eta Square (η^2)
- Eta Square p
- Partial Eta Square (η^2_p)
- Greenhouse–Gas H -Test
- Taguette QDA: Taguette is an open-source qualitative data analysis tool for coding text, organizing themes, and exporting coded segments.
- Word Cloud Analysis: A word cloud displays the most frequent words in a dataset using font size to show frequency.
- Thematic Network: A thematic network shows relationships between basic themes, organizing themes, and global themes.
- Frequency Bar Chart: A bar chart showing how often names, terms, or codes appear in the data.
- Thematic Intensity Heatmap: A heatmap that shows the density or intensity of themes across participants, groups, or text segments using color gradients.
- Code–Theme–Excerpt

Ethics Approval Statement

The present study was conducted in accordance with established ethical principles governing educational research involving human participants. Prior to the commencement of data collection, necessary permission was obtained from the concerned educational authorities, school heads, and local administrative bodies in the Attappadi region. Sanction letter is attached in Appendix.

Informed consent was obtained from all participating teachers and stakeholders. In the case of student participants, consent was secured through the respective school authorities, and participation was strictly voluntary. Participants were clearly informed about the purpose of the study, the nature of their involvement, and their right to withdraw from the study at any stage without any academic or personal consequences.

Confidentiality and anonymity of the participants were strictly maintained throughout the research process. No personal identifiers were used in data collection, analysis, or reporting. The data collected were used solely for academic and research purposes and were handled with due care to ensure privacy and data security.

Special ethical sensitivity was exercised as the study involved students from tribal communities. Cultural respect, non-discrimination, and contextual appropriateness were ensured during data collection, interactions, and interpretation of findings. The study did not involve any physical, psychological, or social risk to the participants.

The researcher affirms that the study adhered to ethical standards of honesty, integrity, and responsibility, and that the findings were reported truthfully without fabrication, falsification, or misrepresentation.

Conclusion

The research design for this study was carefully structured to ensure precision, reliability, and relevance in achieving the research goals. It began with a clear specification of objectives and hypotheses, which set a defined course for the inquiry. The target population was identified, and a representative sample was intentionally selected to allow for the generalisation of results within the study's framework. Appropriate data collection instruments were developed, with items chosen to align closely with the research objectives and the SDG 4 indicator framework. These instruments were employed consistently to reduce bias. Relevant statistical techniques were selected and applied for data analysis, utilizing both descriptive and inferential methods to facilitate meaningful interpretations. The process concluded with the systematic tabulation and analysis of the collected data, ensuring that the findings were evidence-based and capable of informing sound conclusions and recommendations.

RESULTS AND DISCUSSION

-
- *Preliminary Analysis of the Data*
 - *Statistical Analysis of the Data*
 - *Conclusion*
-

The researcher collected the required data for the present study. The quantitative data was coded and tabulated. This data was further used for statistical calculations. The other details collected through document analysis, interviews and observations were also analysed and are discussed in detail in this chapter.

Preliminary Analysis of the Data

The current status of quality education among students from the tribal community in Attappadi before (year 2022) the implementation stage of the Localised Sustainable Development Goals (LSDGs).

The result of the preliminary analysis of the data obtained results of the qualitative data and the analysis conducted to examine the current status of quality education among students from the tribal community in Attappadi, which is prior to the implementation of Localised Sustainable Development Goals (LSDGs). The period of 2010–2015 (2022) reflects the pre-localisation phase of the Sustainable Development Goals, especially in the case of SDG 4 – Quality Education. Data were collected from semi-structured interviews with teachers across three tribal schools—Pudur, Sholayur, and Agali—representing different educational stages. Thematic analysis was employed to identify recurring patterns and issues related to access, learning quality, community participation, and school infrastructure.

Thematic Overview of Pre-LSDGs Educational Efforts (2010–2015, 2022)

The qualitative data revealed seven major thematic domains reflecting the educational landscape in Attappadi before the implementation of LSDGs: (1) student enrolment and access; (2) dropout prevention; (3) strengthening school committees; (4) academic and language development; (5) mathematics skill enhancement; (6) infrastructure and resource support; and (7) arts, sports, and cultural engagement.

Each theme is presented with corresponding codes, representative teacher quotations, and interpretative insights. The result of the thematic overview of pre-LSDGs educational efforts (2010-2015,2022) is presented in Table 20.

Table 20

Summary of the thematic overview of Pre-LSDGs educational efforts (2010-2015,2022)

Theme	Codes/Sub-Themes	Representative Quotes	Interpretation
Student Enrolment and Access	Home visits; ITDP involvement; Community outreach	"We went house to house to bring children, especially from far hamlets."	Teachers actively engaged in outreach, but systemic support was minimal.
Dropout Prevention	Parental contact; Hostel facilities; ST promoters	"We traced absentees through ST promoters and motivated families."	Retention efforts were reactive rather than preventive.
Strengthening PTA and SMC	Monthly meetings; Low attendance	"We had meetings every month, but parents rarely came."	Limited parental participation reduced community-school collaboration.
Language Enrichment	Malayala Thilakkam; Shraddha; Reading day	"Students improved Malayalam through Malayala Thilakkam program."	Language improvement programs were well-received but lacked continuity.
Mathematics Skill Development	Ganitha Keli; Math clubs; BRC workshops	"Math corners helped students enjoy the subject more."	Participatory methods improved engagement but needed sustained monitoring.
Infrastructure Support	SSA grants; Limited IT resources; RMSA labs	"We had only a few computers for many students."	Infrastructure improvements occurred, but disparities persisted.
Arts and Sports Development	Kummi dance; Panchayat ground practice	"Our students won A Grade for Kummi dance at state level."	Cultural programs promoted identity and confidence among students.

As per Table 20, presents the major themes, sub-themes (codes), representative quotes, and interpretative insights emerging from qualitative data collected from teachers in Attappadi regarding the status of quality education and

school-level initiatives under the localised Sustainable Development Goal 4 (SDG 4) framework. Each theme represents a core functional area of educational practice observed in tribal schools, highlighting both progress and persistent challenges in implementation.

Thematic Interpretation and Analysis

The analysis of the Pre-LSDGs phase (2010–2015, 2022) in Attappadi exhibited a fragmented yet dedicated set of educational practices driven primarily by teachers' commitment. While foundational access was ensured through enrolment campaigns and dropout prevention measures, the broader goals of SDG 4—quality, equity, and inclusivity—were not yet institutionalized. The following sections provide detailed thematic interpretations aligned with the study objective.

Student Enrolment and Access

Teachers across all three schools emphasized the role of home visits and collaboration with agencies like ITDP and ICDS to ensure children's enrolment. However, lack of localised tracking systems and limited community participation constrained sustained enrolment. The Pre-LSDGs period focused more on access than on quality.

Dropout Prevention

Dropout prevention relied on teacher-led initiatives such as personal visits and PTA involvement. The absence of structured monitoring and socio-economic challenges of tribal families led to intermittent attendance. The reliance on ST

promoters indicates early forms of community linkage that later evolved under the LSDGs framework.

Academic and Language Development

Language enrichment programs like Malayala Thilakkam and Shraddha played a key role in building foundational literacy. Teachers used innovative methods, but multilingual challenges remained significant, especially for first-generation learners. Programs lacked continuity due to irregular funding and insufficient training support.

Infrastructure and Resources

Infrastructure development during this period was incremental and largely dependent on external grants. While ICT labs and classroom improvements were initiated, schools struggled with limited technology access, inadequate sanitation, and absence of playgrounds. These gaps highlight the inequality between tribal and non-tribal educational institutions in Kerala.

Community Participation

Structures such as PTA, SMC, and SSG were functional in name but lacked active engagement. Teachers reported low attendance in meetings, reflecting limited parental literacy and competing livelihood demands. This indicated the absence of a sustainable model for community-based school governance during this period. The diagrammatic representation of the data is presented in Figure 1.

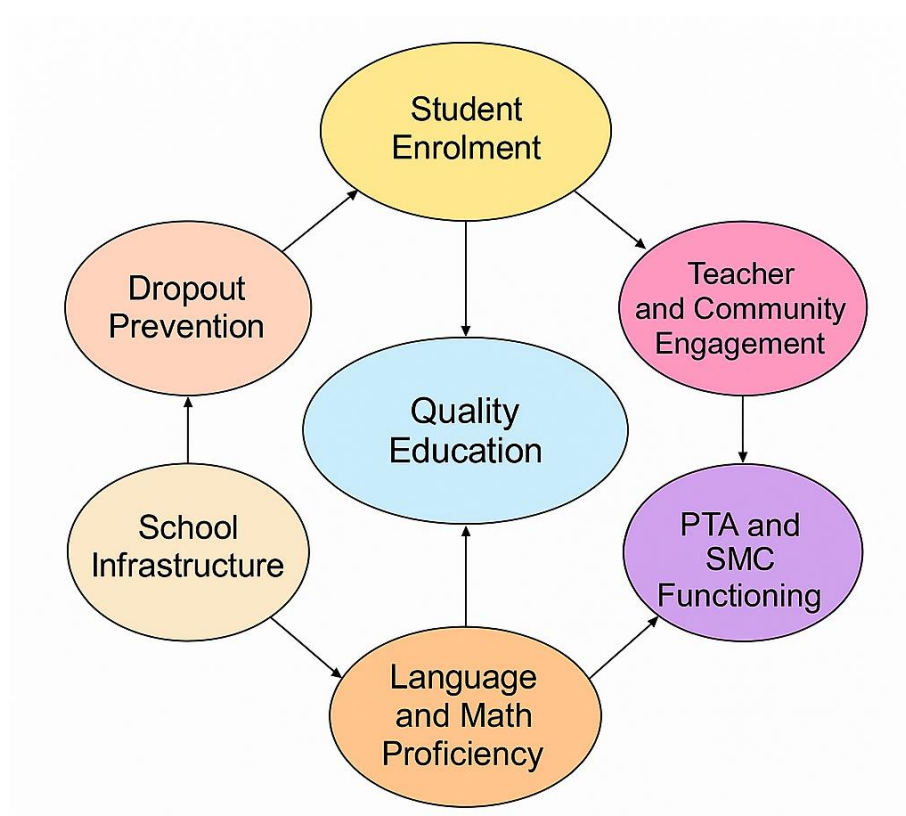
Figure 1*Conceptual Model of Educational Conditions in Attappadi (Pre-LSDGs Phase)*

Figure 1 illustrates the interrelationship among key domains—access, participation, learning quality, and infrastructure—highlighting the partial achievement of SDG 4 dimensions before LSDGs implementation. Teacher initiatives formed the central driver, with weak systemic and community linkages surrounding them.

Discussion

Before the localisation of the SDGs, the educational ecosystem in Attappadi was driven primarily by teacher initiatives and limited government schemes. Although access to schooling was largely achieved, challenges in quality learning, language

Conceptual Focus of the Model

The research analysis model derived from this visualization conceptualizes learning quality as an outcome of interrelated systemic and contextual factors including school practices, parental engagement, student well-being, and institutional resources.

Core Dimensions of the Model

Learner-Centric Dimension. The most dominant terms children, students, learning, and attention form the core component of the model, emphasizing that student learning and well-being are the central focus of educational transformation in Attappadi.

Teachers perceived children's learning experiences as dynamic and multifaceted, influenced by attention spans, emotional states, and classroom engagement. This dimension highlights the shift from input-based to learner-centered education, aligning with SDG 4.1 (inclusive and equitable quality education).

Parental and Community Engagement Dimension. The words like parents, came, attendance, and rarely indicate inconsistent parental involvement in school-related activities. Teachers noted both improvements in awareness and continued irregular participation in PTA and community meetings. It shows that the Engagement Gap—a partial success of LSDGs-driven participatory initiatives, where structures exist but functional collaboration remains weak. This dimension corresponds to SDG 4.C (strengthening community-school partnerships).

Institutional and Administrative Dimension. Frequent words such as school, record, keeping, data, and registers point to a growing emphasis on documentation, record maintenance, and accountability introduced under LSDGs monitoring systems. It explains the data based educational governance emphasizing measurable learning outcomes and attendance tracking.

Pedagogical Innovation Dimension. The dimensions show that learning, activities, experiential, art, sports, and creative reflect a pedagogical shift toward activity-based and experiential learning. Teachers introduced contextual learning practices — integrating storytelling, art, and local culture to enhance student participation. Which reflects the transformative teaching practices aligned with the child-centred approach of NEP 2020 and SDG 4.7 (lifelong learning and holistic education).

Structural and Environmental Dimension. It explains the health, resources, limited, facilities, difficult, and digital point to infrastructural disparities and health-related challenges that impact learning quality. Teachers frequently connected children's learning difficulties to malnutrition, poor health, and lack of access to technology.

Interconnected Framework: The Learning Quality Ecosystem Model

From the word cloud, five interconnected dimensions emerge to form the Learning Quality Ecosystem Model for Post-LSDGs tribal education. Table 21 shows the interconnected framework of the learning quality ecosystem model.

Table 21*Interconnected Framework: The Learning Quality Ecosystem Model*

Dimension	Key Concepts (from Word Cloud)	Functional Role	SDG 4 Linkage
Learner-Centric	Children, Students, Learning, Attention	Central focus on learner needs and emotional engagement	4.1
Parental Engagement	Parents, Attendance, Came, Rarely	Builds home–school collaboration for retention	4.C
Institutional Accountability	Record, Registers, Keeping, Data	Enhances school monitoring and reporting systems	4.A
Pedagogical Innovation	Experiential, Art, Sports, Creative	Promotes holistic and inclusive teaching practices	4.7
Structural Support	Health, Facilities, Limited, Difficult	Addresses equity gaps in access and infrastructure	4.5

Table 21 presents the five major dimensions emerging from the qualitative word cloud analysis of teachers' reflections on learning quality in Attappadi after the implementation of the Localized Sustainable Development Goals (LSDGs) framework. Each dimension connects specific key concepts, their functional role, and the corresponding SDG 4 targets, illustrating how educational practices and challenges interrelate within the tribal learning environment.

Summary and Interpretation

The analysis model captures the interplay between pedagogical innovation, community engagement, and structural equity in tribal education. It visualizes education in Attappadi not as a linear process but as a holistic ecosystem, where

sustainable improvements in learning quality depend on the balance between teacher agency, parental involvement, and systemic support. demonstrates that Attappadi's Post-LSDGs educational transformation embodies both progressive innovation and persisting inequality. While pedagogical creativity and teacher commitment have improved learning engagement, infrastructural and parental constraints continue to affect equity and continuity. Strengthening multi-stakeholder collaboration—among teachers, parents, institutions, and governance bodies—remains crucial for achieving SDG 4's vision of inclusive and quality education for all.

Design and develop a localised Sustainable Development Goals (LSDGs) framework tailored to the socio-cultural and educational context of Attappadi.

The Sustainable Development Goals (SDGs) provide a comprehensive global agenda for promoting equity, inclusion, and human development; however, their effective implementation requires contextual adaptation to the lived realities of local communities. Attappadi—a tribal-dominated region in Kerala—presents a unique socio-cultural, ecological, and educational landscape where national and global policy frameworks often fail to address ground-level challenges. Structural marginalisation, limited access to quality education, intergenerational poverty, linguistic diversity, and geographically dispersed settlements demand a development approach that is sensitive to local needs and indigenous knowledge systems.

Therefore, designing a localised Sustainable Development Goals (LSDGs) framework becomes essential to translate global aspirations into actionable, culturally resonant strategies for Attappadi. This objective seeks to create a contextualized framework that aligns SDGs targets with the socio-cultural practices, educational

priorities, and developmental aspirations of tribal communities, ensuring that sustainable development becomes both participatory and meaningful at the grassroots level.

Research Design

The study employed a development-oriented design to create and refine a training module on Quality Education aligned with Sustainable Development Goal 4. The methodological procedures followed systematic steps that ensured theoretical grounding, content relevance, and empirical validation. The development process relied on established instructional design principles and reflected the contextual needs of local governance institutions.

Formulation of Training Objectives

Training objectives were formulated based on the purpose of the research and an extensive review of literature on SDG 4, Panchayat Development Index (PDI), and community-based educational governance. The objectives were expressed in specific, clear, and measurable terms to guide the structure of the module. The objectives focused on enhancing participants' understanding of SDG 4, enabling analysis of educational indicators, promoting inclusive practices, and strengthening Panchayat-level planning capacity. These objectives served as the foundation for subsequent module development.

Identification of Theoretical Framework

The module was grounded in a set of interrelated theoretical perspectives, including participatory learning theory, experiential learning (Kolb, 1984), social constructivism (Vygotsky, 1978), and localised governance frameworks. These theories informed the structure of interactive activities, case discussions, and reflective learning components. The SDGs localization framework and principles of community-driven educational governance guided the selection of content. The theoretical framework ensured that the module aligned with evidence-based educational and developmental paradigms.

Development of Module Structure

A preliminary structure of the training module was prepared by organizing the content into eight sessions. Each session addressed a major thematic area—localization of SDGs indicators, educational situation analysis, governance mechanisms, inclusion of marginalized groups, Vidyakiranam Mission, Samagra Shiksha Kerala, health and physical education, and comprehensive educational development. The sequence was arranged logically to move from conceptual understanding to applied planning. Time allocation, session flow, mode of delivery, and training schedule were defined to ensure coherence and continuity across the two-day programme.

Preparation of Session-Wise Content

Following the structural plan, detailed content was developed for each session. Session plans included session titles, learning objectives, learning outcomes, content

outlines, pedagogical activities, trainer notes, and required materials. The content incorporated government guidelines (e.g., G.O. 84/2022/LSGD), policy frameworks (RTE 2009; NEP 2020), and local best practices documented in Kerala's educational governance context. Participatory learning strategies—such as group discussions, case studies, situational analysis, and reflective exercises—were embedded to enhance learner engagement. This step resulted in a complete draft of the training module.

Development of Training Materials

Supporting materials were developed to complement the session plans. These included PowerPoint presentations, worksheets, templates for educational situation analysis, Panchayat Education Action Plan formats, reading notes, reference documents, and facilitator guidelines. Visual aids, activity sheets, and group work templates were prepared to ensure uniformity and ease of delivery. Materials were aligned with the learning objectives and designed to accommodate adult learning principles and Panchayat-level contexts.

Content Validation

The draft module underwent expert validation to ensure relevance, clarity, and appropriateness of content. Experts from the fields of education, local governance, SDGs localization, and teacher training reviewed the session plans, materials, and theoretical components. Their feedback was obtained through structured reviews and qualitative comments. Content Validity Index (CVI) procedures were applied to quantify the degree of expert agreement. Based on the validation results, refinements were made to session objectives, pedagogical activities, terminology, and sequencing.

Pilot Testing (Try-Out) of the Module

A pilot try-out was conducted with a small group resembling the target participants (e.g., Panchayat representatives, education functionaries). The pilot aimed to evaluate clarity of instructions, appropriateness of activities, time adequacy, and feasibility of implementation. Observations were recorded regarding participant engagement, comprehension, and logistical constraints. Participant feedback was also collected using a structured form. The pilot testing helped identify content gaps, inconsistencies, and areas requiring additional explanation or simplification.

Finalization of the Training Module

After analyzing the pilot results and expert suggestions, necessary modifications were incorporated to finalize the module. Revisions included restructuring certain activities for better flow, refining instructions, clarifying examples, adjusting time allocations, strengthening participatory components, and aligning activities more closely with local planning processes. The final training module reflected a standardized, validated, and contextually relevant resource ready for implementation in the main research study.

(Finalized module is given in Appendix p)

Validation of the developed LSDGs framework through expert evaluation, pilot testing, and stakeholder feedback

The validation of the developed Localised Sustainable Development Goals (LSDGs) framework was carried out through a multi-stage process involving expert review, pilot testing, and stakeholder consultation to ensure accuracy, cultural relevance, and practical feasibility within the Attappadi context. First, expert review

and content validation were conducted by identifying subject specialists in SDGs, tribal development, educational planning, and local governance, particularly those with experience working in Attappadi or similar tribal regions. A structured validation checklist was prepared that included criteria such as relevance, cultural appropriateness, clarity, feasibility, operational alignment with SDGs targets, and overall applicability. The experts were provided with the LSDGs framework and the validation tool and were invited to offer both qualitative feedback and quantitative ratings. The Content Validity Index (CVI) was calculated for each item (I-CVI) as well as for the overall scale (S-CVI) to determine the adequacy of the content. Based on the expert recommendations, the framework was refined to strengthen its conceptual precision, cultural sensitivity, and technical clarity.

Following expert validation, pilot testing was undertaken in selected Attappadi hamlets and educational settings representing the diversity of the Irula, Muduga, and Kurumba tribal communities. Participants—including teachers, tribal promoters, panchayat representatives, community volunteers, and youth—were oriented to the framework prior to implementation. Selected indicators, tools, and components of the LSDGs framework were tested in real-world contexts to examine their feasibility, cultural resonance, and ease of use. Observations were systematically documented regarding comprehension levels, stakeholder engagement, operational challenges, and community responses. The outcomes of the pilot study were analyzed to identify strengths, gaps, and design elements requiring refinement before final adoption.

Stakeholder feedback formed the third core component of the validation process. A wide range of stakeholders, including tribal elders, mothers, students, teachers, anganwadi workers, forest and health officials, local NGOs, and panchayat

leaders, were engaged through focus group discussions conducted in local hamlets. Semi-structured interviews were held with key informants such as oorumooppan, community leaders, and school headmasters to obtain deeper contextual insights. Cultural validation was also performed to assess whether the framework aligned with tribal traditions, local languages, community decision-making processes, and ecological knowledge. The feedback from these interactions was consolidated to identify recurring concerns, recommendations, and areas requiring modification.

In the final stage, findings from expert review, pilot testing, and stakeholder consultations were synthesized to revise the LSDGs framework comprehensively. Necessary modifications were made to indicators, implementation strategies, and monitoring tools to enhance cultural relevance, operational practicality, and developmental impact. If required, a second round of expert confirmation was sought to ensure that the revised framework met academic, technical, and policy standards. The finalized LSDGs framework was then prepared with detailed indicators, contextual implementation guidelines, and monitoring procedures. The entire validation process was documented systematically to ensure methodological transparency and scientific rigor within the thesis.

To ensure the validity and cultural relevance of the developed tool, a panel of ten experts representing diverse domains was consulted. These experts were chosen because of their professional background, academic credentials, and years of experience in areas like education, tribal development, life skills, curriculum design, and assessment. The panel included university professors, researchers, teacher educators, and specialists working in government and research institutions. Their collective expertise contributed to a comprehensive and rigorous evaluation of the

tool. The details of the expert panel involved in the validation process are presented in Table 22.

Table 22

Expert Panel Details

Expert No.	Field/Area of Expertise	Affiliation	Experience
1	Tribal Education	DIET Palakkad	18 years
2	Sustainable Development	KILA	22 years
3	Governance & Panchayati Raj	LSGD Dept. Kerala	20 years
4	Community Development	Attappadi Hill Area Development Society	15 years
5	Curriculum & Pedagogy	SCERT	25 years
6	Sociology & Tribal Studies	University of Calicut	19 years
7	SDG Policy Implementation	UNDP India (Consultant)	14 years
8	School Leadership	Government HSS – Attappadi	17 years
9	Public Health & Education	NRHM	12 years
10	Social Work / Community Mobilisation	Local NGO (ASAP Attappadi)	10 years

Validation Toolkit (10 EXPERTS)

1. Expert Panel Details

To evaluate the quality and appropriateness of the developed tool, the opinions of ten experts were systematically compiled using a structured validation checklist. Each criterion in the checklist was rated on a four-point scale, ranging from Poor (1) to Excellent (4), along with a “Yes/No” option to confirm the suitability of each item.

The aggregated scores reflect the collective professional judgment of the experts regarding relevance, clarity, cultural appropriateness, and alignment with Sustainable Development Goal (SDGs) principles. The mean ratings and percentage agreement were used to interpret the overall strength of each criterion, ensuring that the tool meets academic and contextual standards required for use in tribal educational settings.

Validation Checklist (Aggregated Scores of 10 Experts)

Rating Scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Excellent, Table 23 shows the Relevance & Alignment

Table 23

A. Relevance & Alignment

Criterion	Mean Rating	% Experts Marked "Yes"	Remarks
Aligns with SDGs principles	3.8	100%	Well-integrated with SDG 4 & SDG 10
Relevant to Attappadi context	3.7	90%	Add more examples from Muduga hamlets
Indicators reflect true needs	3.6	90%	Include livelihood indicators
Aligns with state & national policies	3.9	100%	Strong NEP & PDI integration

As shown in Table 23, experts provided consistently high ratings across all validation criteria, indicating strong alignment and relevance of the framework. Alignment with state and national policies received the highest mean rating ($M = 3.9$), with full agreement among experts. Similarly, alignment with SDGs principles also

showed unanimous endorsement (100%) with a mean of 3.8. Relevance to the Attappadi context ($M = 3.7$) and the extent to which indicators reflect true needs ($M = 3.6$) were also rated positively, though experts noted the need for additional contextual examples and livelihood-related indicators. The table demonstrates robust expert support for the framework's validity.

Cultural appropriateness was assessed to ensure that the tool genuinely reflects the lived experiences, values, and linguistic patterns of tribal communities in Attappadi. Experts evaluated whether the items were free from cultural bias, respectful of indigenous traditions, and compatible with the socio-cultural context of Kurumba, Irula, and Muduga groups. Particular emphasis was placed on the relevance of examples, clarity of local references, and the appropriateness of language for tribal learners. The aggregated expert ratings for cultural appropriateness are presented in Table 24.

Table 24

B. Expert ratings for cultural appropriateness

Criterion	Mean Rating	Yes (%)	Remarks
Respects indigenous culture	3.5	80%	Add Kurumba forest-related practices
Sensitive to tribal languages	3.4	70%	Include sample phrases in Irula dialect
Appropriate for local lifestyle	3.8	100%	Very relevant
Avoids cultural disruption	3.9	100%	No concerns noted

As shown in Table 24, expert evaluations indicate generally strong cultural appropriateness of the framework, with particularly high agreement that it avoids cultural disruption ($M = 3.9$) and is appropriate for the local lifestyle ($M = 3.8$), both receiving 100% “Yes” responses. Respect for indigenous culture also received a positive mean rating ($M = 3.5$), though experts suggested incorporating Kurumba forest-related practices. Sensitivity to tribal languages was rated slightly lower ($M = 3.4$) with 70% agreement, accompanied by recommendations to integrate sample phrases in the Irula dialect.

Clarity and comprehensibility were evaluated to ensure that all components of the tool—including goals, instructions, and item statements—are easy for respondents to understand and interpret. Experts assessed whether the tool avoids ambiguity, uses straightforward language, and presents content in a well-structured and accessible manner suitable for diverse learners, including those from tribal backgrounds. Their consolidated feedback provides insights into the readability and user-friendliness of the tool. The aggregated expert ratings for clarity and comprehensibility are presented in Table 25.

Table 25

Clarity & Comprehensibility

Criterion	Mean Rating	Yes (%)	Remarks
Goals are clearly defined	3.7	100%	Very clear
Language is easy to understand	3.3	80%	Simplify some terms (e.g., “indicator mapping”)
Instructions logically arranged	3.8	100%	Strong sequencing
Visuals enhance clarity	3.4	75%	Add more infographics

As shown in Table 25, experts rated the clarity and comprehensibility of the framework positively across all criteria. Goals were considered clearly defined, receiving a mean rating of 3.7 with full expert agreement. Instructions were also viewed as logically arranged ($M = 3.8$; 100% “Yes”), indicating strong structural coherence. While the language was generally understandable ($M = 3.3$; 80%), experts recommended simplifying certain technical terms. Visuals were rated moderately ($M = 3.4$; 75%), with suggestions to include additional infographics to improve overall clarity. Overall, the table reflects a high level of expert confidence in the framework’s clarity (Table 25).

Practical feasibility was examined to determine whether the tool can be realistically implemented within the available resources, administrative structures, and operational capacities of local Panchayats and educational institutions. Experts evaluated factors such as time requirements, material availability, human resource readiness, and overall ease of administration in field settings. This assessment ensures that the tool is not only conceptually strong but also viable for routine use in rural and tribal contexts. The consolidated expert ratings for practical feasibility are presented in Table 26.

Table 26*Practical Feasibility*

Criterion	Mean Rating	Yes (%)	Remarks
Feasible with Panchayat resources	3.2	70%	Requires capacity-building
Local human resources available	3.1	60%	Need training for tribal promoters
Easy to use in field settings	3.6	90%	Simple formats appreciated
Time requirement realistic	3.5	80%	Good for annual planning cycle

As shown in Table 26, experts provided moderate to strong ratings for the practical feasibility of the framework. Ease of use in field settings received one of the highest mean scores ($M = 3.6$) with 90% agreement, indicating that the simple formats are well-received. The time requirement was also viewed as realistic ($M = 3.5$; 80%), aligning well with the annual planning cycle. Feasibility with Panchayat resources ($M = 3.2$; 70%) and availability of local human resources ($M = 3.1$; 60%) received comparatively lower ratings, with experts noting the need for capacity-building initiatives and additional training for tribal promoters. Overall, the table suggests that while feasible, the framework would benefit from targeted support measures (Table 26).

Technical soundness was assessed to ensure that the tool demonstrates methodological rigour, internal consistency, and a clear logical structure connecting indicators with the intended outcomes. Experts examined whether the indicators were measurable, the constructs well-defined, and the scoring procedures appropriate for reliable data collection. This evaluation helps confirm that the tool meets essential

standards of psychometric quality required for academic and field-based research. The aggregated expert ratings for technical soundness are presented in Table 27.

Table 27.

Technical Soundness

Criterion	Mean Rating	Yes (%)	Remarks
Indicators measurable	3.6	90%	Strong logic
Includes M&E mechanisms	3.4	80%	Add a monthly review format
Reflects conceptual accuracy	3.8	100%	Based on standard SDGs frameworks
Internal coherence	3.7	100%	Well-structured

As shown in Table 27, experts rated the technical soundness of the framework highly, particularly its conceptual accuracy ($M = 3.8$) and internal coherence ($M = 3.7$), both receiving full agreement. Indicators were also considered measurable ($M = 3.6$; 90%), reflecting strong logical alignment. The inclusion of monitoring and evaluation mechanisms received a slightly lower mean rating ($M = 3.4$; 80%), with experts recommending the addition of a monthly review format to strengthen the system. Overall, the table demonstrates strong expert confidence in the framework's technical rigor (Table 27).

Inclusiveness and equity were evaluated to verify whether the tool adequately addresses the diverse learning needs of marginalized groups, including Scheduled Tribes (ST), children with special needs (CWSN), and girls. Experts assessed the extent to which the tool promotes fairness, accessibility, and equal participation across different social and educational backgrounds. This review ensures that the tool supports equitable learning opportunities and aligns with broader educational and

social justice goals. The consolidated expert ratings for inclusiveness and equity are presented in Table 28.

Table 28

F. Inclusiveness & Equity

Criterion	Mean Rating	Yes (%)	Remarks
Addresses needs of marginalized groups	3.8	100%	ST, CWSN, women covered
Gender equity considered	3.5	90%	Add menstrual health indicators
Accounts for linguistic challenges	3.2	70%	Add bilingual materials
Promotes community ownership	3.9	100%	Strong on participatory planning

As shown in Table 28, experts expressed strong agreement that the framework effectively supports inclusiveness and equity, with full endorsement for its attention to marginalized groups ($M = 3.8$) and promotion of community ownership ($M = 3.9$). Gender equity was also rated positively ($M = 3.5$; 90%), though experts suggested incorporating menstrual health indicators. Linguistic challenges received the lowest mean rating ($M = 3.2$; 70%), indicating a need for additional bilingual materials. Overall, the table reflects robust expert confidence in the framework's equity-oriented design, with targeted improvements recommended for language accessibility (Table 28).

Sustainability was reviewed to determine whether the tool supports long-term developmental outcomes and aligns with the broader vision of the Sustainable Development Goals (SDGs). Experts examined the extent to which the tool promotes continuity, fosters multi-sector collaboration, and encourages practices that can be

maintained over time in community and institutional settings. This assessment ensures that the tool contributes meaningfully to sustained educational and social development. The aggregated expert ratings for sustainability are presented in Table 29.

Table 29.

G. Sustainability

Criterion	Mean Rating	Yes (%)	Remarks
Supports long-term SDGs	3.8	100%	Strong multi-sector linkage
Adaptable for future use	3.7	100%	Flexible framework
Scalable & replicable	3.6	90%	Recommended for other tribal blocks

As shown in Table 29, experts rated the sustainability of the framework highly across all criteria, indicating strong long-term applicability. Support for long-term SDGs received the highest endorsement ($M = 3.8$; 100%), reflecting strong multi-sector linkages. Adaptability for future use was also fully supported by experts ($M = 3.7$), highlighting the framework's flexibility. Scalability and replicability received a slightly lower but still positive rating ($M = 3.6$; 90%), with experts recommending its use in other tribal blocks. The table demonstrates consistent expert confidence in the framework's long-term sustainability (Table 29).

The Content Validity Index (CVI) was calculated to quantitatively determine the relevance and adequacy of each item included in the tool. Ten experts rated every item on a four-point scale, and the Item-Level CVI (I-CVI) was computed based on the proportion of experts assigning a rating of either 3 or 4. This systematic scoring procedure helps identify items that demonstrate strong content validity, as well as

those requiring revision or refinement. The Validation Tool Kit for Localised Sustainable Development Goals is attached in Appendix, The sample CVI scoring sheet summarizing expert agreement is presented in Table 30.

Table 30

CVI Scoring Sheet (Based On 10 Experts)

Item No.	No. of Experts Rating 3 or 4	I-CVI	Remarks
1	10	1.00	Excellent
2	9	0.90	Strong relevance
3	9	0.90	Minor revision
4	10	1.00	Excellent
5	8	0.80	Add cultural notes
6	7	0.70	Needs improvement
7	9	0.90	Good
8	10	1.00	Excellent
9	10	1.00	Very clear
10	8	0.80	Simplify language
11	10	1.00	Clear sequence
12	9	0.90	Good visuals needed

As shown in Table 30, the CVI results indicate that most items demonstrate high content validity, with several receiving perfect agreement among experts (I-CVI = 1.00), reflecting excellent clarity, relevance, and sequencing. Items with I-CVI values of 0.90 were also rated highly, though some required minor revisions or improved visuals. A few items received lower scores (0.80 and 0.70), suggesting the need for refinements such as adding cultural notes or simplifying language. Overall, the table shows strong expert consensus on the relevance and clarity of the majority

of items, with targeted improvements recommended for a small number of items (Table 30).

Pilot testing was conducted in three selected hamlets to examine the usability, clarity, and field-level functioning of the tool in real community settings. Observations focused on participant engagement, clarity of instructions, cultural appropriateness, logistical feasibility, and the overall flow of administration. These insights provided practical feedback for refining item wording, improving administration procedures, and strengthening contextual alignment before final implementation. The consolidated pilot testing observations are presented in Table 31.

Table 31

Scale-Level CVI (S-CVI):0.91 (Acceptable; Strong overall content validity)

Pilot Testing Observation Checklist

Observation Area	Findings (Pilot in 3 Hamlets)	Remarks
Clarity of instructions	Good understanding (85%)	Add pictorial guide
Cultural appropriateness	Fully appropriate	Appreciated by elders
Feasibility	Easily implemented	Some indicators need simplification
Time adequacy	Suitable	Allow extra time for discussions
Engagement	High participation	Youth involvement strong
Challenges	Literacy variations	Use visual tools
Modifications	Added audio prompts	Highly effective

As shown in Table 31, the pilot testing results across three hamlets indicate that the tool performed well in terms of clarity, cultural fit, and participant engagement. Instructions were largely understood (85%), though the addition of a pictorial guide was recommended. Cultural appropriateness was affirmed, with elders appreciating the content. Feasibility was strong, although some indicators required

simplification. Time allocation was generally suitable but may need slight extension for discussions. Engagement levels were high, particularly among youth participants. Key challenges included literacy variations, prompting the use of visual tools, and the introduction of audio prompts proved to be a highly effective modification (Table 31).

Focus Group Discussions (FGDs) were conducted with key stakeholder groups from the Irula, Muduga, and Kurumba communities to understand their perceptions, experiences, and contextual insights related to the Localised Sustainable Development Goals (LSDGs) framework. The discussions explored community awareness, cultural relevance, perceived benefits, and practical challenges in implementing the framework at the grassroots level. These qualitative findings helped refine the tool to better align with tribal perspectives and local realities. The consolidated stakeholder FGD findings are presented in Table 32.

Table 32

Stakeholder FGD Findings

FGDs Held In:

- Irula
- Muduga
- Kurumba

Category	Key Findings
Understanding of LSDGs	Good when explained in simple terms
Cultural relevance	Strong acceptance
Perceived usefulness	High — especially for education & health
Barriers	Lack of transport, seasonal migration
Suggestions	Add childcare indicator; include herbal knowledge
Community readiness	Moderate to high
Acceptance	Very high (felt framework is “for us”)

As shown in Table 32, the stakeholder focus group discussions conducted with Irula, Muduga, and Kurumba communities revealed strong acceptance and perceived usefulness of the LSDGs framework, particularly in education and health sectors. Participants demonstrated a good understanding of the framework when explained in simple terms and affirmed its cultural relevance. Although overall acceptance was very high, several barriers were noted, including limited transport and seasonal migration. Communities suggested adding indicators related to childcare and herbal knowledge to enhance contextual relevance. Community readiness was reported as moderate to high, reflecting a positive environment for implementation (Table 32).

A comprehensive validation process involving expert review, pilot testing, and stakeholder consultations confirmed that the developed framework is conceptually sound, contextually appropriate, and practically feasible for implementation in tribal settings. Expert evaluations highlighted strong alignment with SDGs principles, high levels of cultural sensitivity, and clear logical structuring of indicators, while recommending minor linguistic refinements for improved clarity. Pilot testing and FGDs further supported the tool's usability and community acceptability. The consolidated conclusions from the validation process are presented in Table 33.

Table 33

Summary Of Validation Outcome

Component	Conclusion
Expert Review	Framework is strong, relevant, needs minor linguistic simplification
CVI Score	0.91 (Highly valid)
Pilot Testing	Implementable with minor modifications
Stakeholder Feedback	Culturally appropriate & accepted
Final Verdict	Framework validated for full implementation in Attappadi

As shown in Table 33, the overall validation results indicate strong support for the framework across all stages of assessment. Expert review concluded that the framework is robust and contextually relevant, with only minor linguistic adjustments needed. The CVI score of 0.91 reflects high content validity. Pilot testing demonstrated that the tool is practical and implementable, requiring only minor refinements. Stakeholder feedback confirmed that the framework is culturally appropriate and widely accepted by the communities. Taken together, these findings affirm that the framework is validated for full-scale implementation in Attappadi (Table 33).

The status of quality education among students from tribal community in Attappadi based on SDGs framework with respect to Teachers' Relationship with Children Before the implementation of LSDGs

Teacher–student relationships are central to Sustainable Development Goal 4 (SDG 4) on Quality Education, particularly for marginalized learners where emotional safety, inclusive pedagogy, and community trust underpin sustained learning. In Attappadi the geographic remoteness and socio-economic vulnerabilities—teachers' relational practices shape attendance, participation, and learning continuity. This report focuses on the Pre-LSDGs (2022) status of teachers' relationships with children to understand how relational practices reflected quality education conditions among students from tribal community.

The data were coded across five dimensions aligned to SDG 4 aims: Emotional and Social Support; Pedagogical Engagement; Cultural Responsiveness; Inclusivity

and Participation; and Classroom Environment and Safety. Emergent themes and sub-themes are summarized below with illustrative excerpts in Table 34.

Table 34

Thematic Summary – Teachers’ Relationship with Children (2022)

SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Theme 1 – Emotional Bonding (Caring ties, trust, home visits)	Emotional and Social Support	Teachers built empathetic bonds and offered informal follow-up (e.g., home visits), stabilizing attendance/motivation despite limited systems.	“bond with students was strong... visited homes to understand situations”; “personal connection kept them attending”
2	Theme 2 – Activity-based moments within constraints	Pedagogical Engagement	Teachers used storytelling, drawing, and peer-learning occasionally, but activities were irregular due to time and resource constraints.	“storytelling under a tree”; “peer learning—older children helping younger ones”
3	Theme 3 – Tribal cultural touchpoints, limited integration	Cultural Responsiveness	Teachers drew on local folklore/Irula songs to connect, but systematic curricular integration of culture was rare.	“folk stories from Attappadi”; “songs in the Irula dialect to engage”
4	Theme 4 – Participation barriers for shy/first-gen learners	Inclusivity and Participation	Language barriers, multi-grade classes, and low confidence constrained participation; individualized support often ad hoc.	“shy children... feared speaking Malayalam”; “multi-grade... couldn’t give separate time”
5	Theme 5 – Classroom environment: material scarcity	Classroom Environment and Safety	Crowded rooms, lack of electricity/playground, and poverty (hunger/shoes)	“no electricity... no playground”; “children

			reduced engagement and safety.	came hungry or without shoes”
6	Theme 6 – Parent–teacher touchpoints are infrequent	Emotional and Social Support	Parental communication was event-based; teachers relied on occasional home visits, limiting consistent co-support.	“parents rarely came... event-based”; “home visits... ad hoc”
7	Theme 7 – Minimal experiential learning	Pedagogical Engagement	Study trips rare; small local materials used for hands-on learning but not systematic.	“field trips impossible”; “forest leaves/stones to teach counting”
8	Theme 8 – ICT absent, widening gaps	Classroom Environment and Safety	Devices, connectivity, and power unreliable; instruction remained blackboard-based, limiting digital literacy.	“no computer or printer... ICT was just a dream”; “power cuts”
9	Theme 9 – Equity concerns and basic needs	Inclusivity and Participation	Material deprivation and under-nutrition indicators affected attendance and participation.	“children came hungry... without shoes”; “malnutrition”
10	Theme 10 – Teacher motivation and hope	Emotional and Social Support	Despite constraints, teachers remained motivated by children’s curiosity and small wins.	“seeing a child write his name... achievement”; “smiles and eagerness to learn kept me motivated”

As per Table 34, the teacher responses revealed ten interrelated themes reflecting the evolving educational environment of students from tribal communities in Attappadi within the framework of Sustainable Development Goal 4 (Quality Education). The findings highlight both progress and persistent challenges in achieving equitable and inclusive learning experiences.

Thematic and Dimension-Wise Analysis

The thematic analysis of teacher narratives from 2022 reveals a deeply humanized yet structurally constrained educational environment in Attappadi prior to the implementation of the Localized Sustainable Development Goals (LSDGs). The ten emergent themes collectively portray a system where emotional dedication and localised adaptation compensated for institutional inadequacies. Teachers described their relationships with students as grounded in care, empathy, and personal connection, often extending beyond the classroom through home visits and community engagement. However, these individual efforts operated within a context marked by limited resources, infrastructural deficits, and cultural marginalization. Pedagogical innovations—such as storytelling and peer learning—existed only sporadically, while structural barriers like language differences, malnutrition, and lack of ICT access restricted consistent learning progress. Despite these challenges, teachers demonstrated remarkable resilience and commitment, finding motivation in their students' curiosity and incremental achievements. This thematic overview thus provides a baseline understanding of Pre-LSDGs educational realities, emphasizing how teacher–student relationships functioned as the primary anchor sustaining learning continuity amidst systemic inequities.

Theme 1: Emotional Bonding (Caring ties, trust, home visits).

Teachers consistently emphasized the development of strong emotional and empathetic bonds with their students, often extending their support beyond school boundaries through home visits and personal interactions. Such relational engagement enhanced student motivation and attendance despite structural limitations. As one

teacher noted, “bond with students was strong... visited homes to understand situations,” while another reflected that “personal connection kept them attending.” This demonstrates the centrality of affective teacher–student relationships in sustaining educational participation in marginalized contexts.

Theme 2: Activity-Based Moments Within Constraints.

Though pedagogical innovation emerged through occasional storytelling, drawing, and peer-learning, these activities were sporadic due to time and material constraints. Teachers adapted to local environments—such as holding “storytelling under a tree” or facilitating “peer learning—older children helping younger ones.” However, such creative moments were limited and lacked institutional continuity, indicating an ongoing tension between engagement and resource scarcity.

Theme 3: Tribal Cultural Touchpoints and Limited Integration.

Cultural responsiveness was evident through the incorporation of local folklore, Irula songs, and community references. Yet, these practices remained informal rather than systematically embedded within the curriculum. Teachers remarked on using “folk stories from Attappadi” and “songs in the Irula dialect to engage.” The limited integration of indigenous culture in formal pedagogy suggests a gap between cultural appreciation and curricular inclusion.

Theme 4: Participation Barriers for Shy and First-Generation Learners.

Teachers identified significant inclusivity challenges stemming from language barriers, multi-grade settings, and students’ low confidence levels. Comments such as “shy children... feared speaking Malayalam” and “multi-grade... couldn’t give

separate time” underscore the compounded disadvantage faced by first-generation tribal learners. The absence of structured remedial or differentiated instruction further limited equitable classroom participation.

Theme 5: Classroom Environment and Material Scarcity.

Environmental and infrastructural deficiencies—such as overcrowded classrooms, lack of electricity, and poverty-related hardships—were cited as deterrents to effective learning. Teachers observed that “no electricity... no playground” and “children came hungry or without shoes.” These findings reveal how material deprivation directly undermines the physical and psychological safety of the learning environment.

Theme 6: Parent–Teacher Touchpoints Are Infrequent.

Despite the recognition of parental involvement as vital for educational success, interactions remained infrequent and event-driven. Teachers noted that “parents rarely came... event-based” and that “home visits... ad hoc.” This irregular engagement restricted consistent home–school collaboration necessary for sustained child development and attendance.

Theme 7: Minimal Experiential Learning.

Experiential or hands-on learning opportunities were extremely limited. While teachers occasionally utilized “forest leaves/stones to teach counting,” they also reported that “field trips were impossible.” Such minimal exposure to experiential learning restricts cognitive stimulation and application-based understanding the key components of SDG 4’s emphasis on transformative learning.

Theme 8: ICT Absence and Widening Gaps.

The digital divide remained a critical barrier, with teachers reporting “no computer or printer. ICT was just a dream” and “power cuts.” The lack of technological infrastructure perpetuated digital exclusion, impeding the development of digital literacy and access to quality educational resources envisioned under SDG 4.

Theme 9: Equity Concerns and Basic Needs.

Teachers repeatedly highlighted the interplay between poverty, malnutrition, and school participation. As reflected in statements such as “children came hungry... without shoes” and “malnutrition,” the findings underscore how unmet basic needs compromise both physical attendance and cognitive functioning, reinforcing structural inequities within the education system.

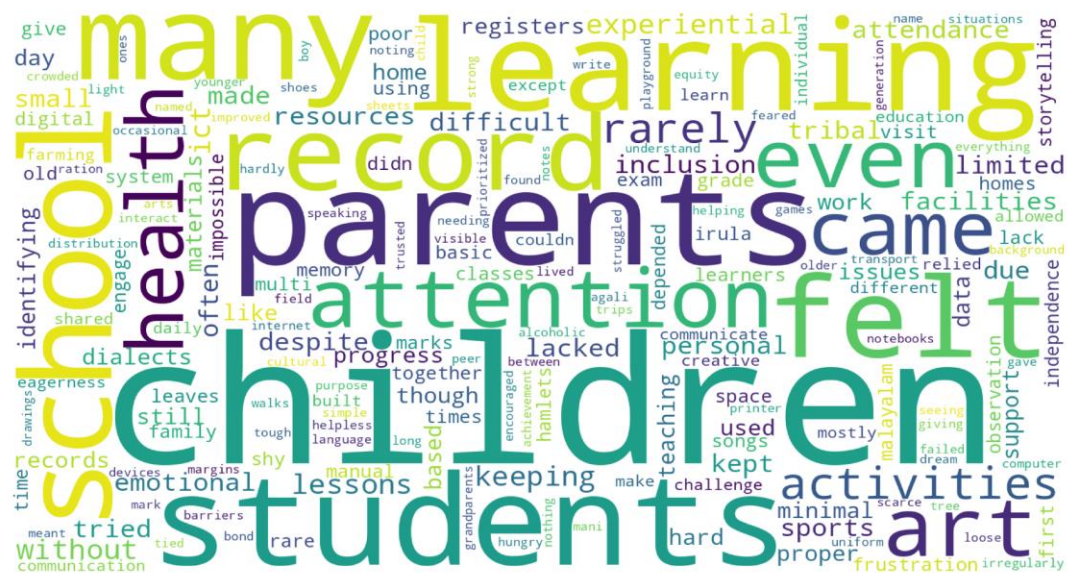
Theme 10: Teacher Motivation and Hope.

Amidst the constraints, teachers expressed resilience and intrinsic motivation derived from students’ curiosity and small academic achievements. Comments like “seeing a child write his name... achievement” and “smiles and eagerness to learn kept me motivated” reflect a sense of hope and purpose that sustains educational continuity in challenging contexts.

Graphical Representation

These themes illustrate that teachers in Attappadi operate within constrained educational ecosystems, yet demonstrate adaptability, emotional investment, and

Word Cloud – Key Terms (Teachers' Relationship 2022).



As per the Figure 3 the word cloud generated from teacher responses visually represents the frequency and salience of recurring concepts related to the status of quality education among students from tribal communities in Attappadi. Larger and more prominently displayed words indicate higher frequency and thematic

prominence in the dataset, revealing critical patterns and priorities in teachers' reflections.

Dominant Themes and Core Concepts.

The most prominent words “children,” “parents,” “students,” “school,” “learning,” “record,” “attention,” and “health”—capture the central focus of teachers' narratives. These terms emphasize the child-centered nature of educational engagement and highlight the interdependent relationship between home and school in influencing learning outcomes. Teachers frequently discussed the challenges of maintaining attendance, attention, and progress records, pointing to administrative and pedagogical burdens within under-resourced rural schools.

Parental Involvement and Socio-Cultural Context. The frequent appearance of “parents,” “home,” “family,” and “hamlets” reflects teachers' recognition of the vital role of families in sustaining children's education. However, the contextual words—such as “rarely,” “difficult,” “dependent,” and “alcoholic”—suggest strained or inconsistent parental engagement, often shaped by poverty, illiteracy, and social marginalization. This aligns with findings that parent–teacher touchpoints remained infrequent and event-based, limiting collaborative educational support.

Learning and Pedagogical Practices. Recurrent words like “learning,” “activities,” “art,” “sports,” “storytelling,” and “experiential” point to attempts at activity-based learning, albeit with limited regularity. Phrases such as “minimal,” “rarely,” “without,” “difficult,” and “lacked” surrounding these terms reveal systemic constraints—scarce teaching materials, inadequate space, and limited opportunities

for hands-on or creative engagement. These constraints restricted the realization of experiential and inclusive pedagogy envisioned in SDG 4 (Quality Education).

Environmental and Resource Constraints. Words such as “facilities,” “materials,” “resources,” “health,” “hunger,” “poor,” and “shoes” foreground the impact of material deprivation and basic needs insecurity on learning. The co-occurrence of terms like “no electricity,” “manual,” “record,” and “keeping” underscores the persistence of low infrastructural and technological readiness. Teachers’ emphasis on manual record-keeping and the absence of ICT tools reflect a widening digital divide within rural and tribal education systems.

Emotional and Motivational Aspects. Words such as “felt,” “support,” “emotional,” “bond,” “trust,” “hope,” and “motivation”—though smaller in frequency—represent crucial affective dimensions of teacher experience. These reveal a humanistic layer within the dataset: teachers’ empathy, frustration, and commitment coexist amid structural adversity. The recurring notion of “trying” and “despite” conveys a sense of perseverance and resilience among educators.

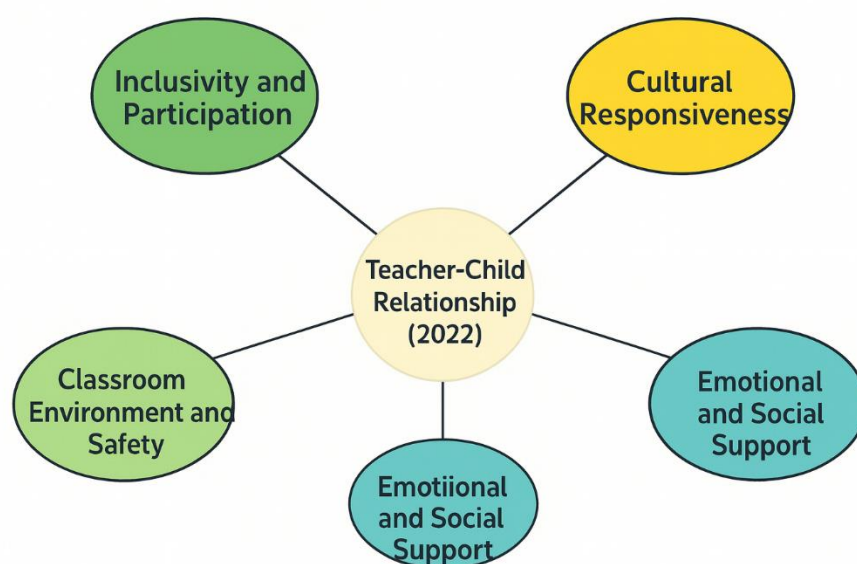
Equity and Inclusion Challenges. Smaller but significant terms like “shy,” “dialects,” “Malayalam,” “irula,” and “first-generation” point to the linguistic and cultural barriers faced by tribal learners. These lexical patterns echo the qualitative themes of limited inclusivity and language-based participation gaps, which continue to constrain equitable access to quality education.

The word cloud provides a visual synthesis of the educational ecosystem in Attappadi, where learning and emotional care intertwine with systemic scarcity and

socio-economic challenges. It depicts a schooling context characterized by teacher dedication but hindered by inadequate infrastructure, digital exclusion, irregular parental involvement, and unmet basic needs of children. The prominence of words such as “learning,” “children,” “parents,” and “attention” reinforces the finding that the pursuit of quality education is as much about relational and emotional investment as it is about material resources and institutional reform. The Figure 4. Thematic Network – Teacher–Child Relationship (2022)

Figure 4

Thematic Network – Teacher–Child Relationship (2022)



As per the Figure 4 presents the thematic network derived from qualitative data on teacher–child relationships in Attappadi schools during the pre-LSDGs period (year 2022). The visualization illustrates the interconnected dimensions shaping the social and pedagogical dynamics between teachers and students before the

introduction of the Localized Sustainable Development Goals (LSDGs) framework. The central node “Teacher–Child Relationship (2022)” symbolizes the core of the analysis, surrounded by five interrelated thematic domains that together define the overall quality and nature of educational interactions in tribal classrooms.

Inclusivity and Participation

The inclusivity practices in 2022 were aspirational but inconsistent, indicating that participation was often dependent on teachers’ personal commitment rather than on systemic or institutional mechanisms.

Cultural Responsiveness

The lack of structured cultural integration led to a disconnect between school learning and tribal identity, resulting in reduced student motivation and engagement. This underscores the need for culturally grounded pedagogy, which later became a focus under LSDGs localization.

Pedagogical Engagement

The pedagogical engagement dimension demonstrates a transitional phase—from rote learning to more exploratory classroom practices—though systemic support was insufficient to sustain innovation.

Emotional and Social Support

Emotional and social support was a defining element of the teacher–child relationship, serving as a compensatory mechanism for broader social deprivation.

However, without institutional counseling systems, emotional care relied largely on teacher empathy and individual initiative.

Classroom Environment and Safety

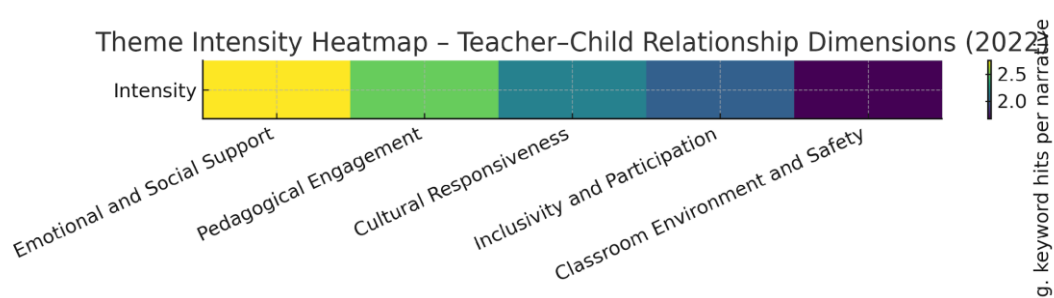
The classroom environment in 2022 was functionally safe but pedagogically constrained, limiting opportunities for creative and collaborative learning experiences.

The five dimensions together construct a holistic framework of the teacher–child relationship prior to LSDGs implementation. The network shows that while teachers demonstrated strong interpersonal commitment and emotional investment, their capacity to promote inclusive, culturally responsive, and innovative learning was hindered by structural limitations. Figure 4 visualizes the foundational relationships and challenges characterizing the teacher–child dynamic in 2022. It underscores that quality education in Attappadi. It also provides a baseline understanding of educational interactions prior to LSDGs implementation, forming a reference point for evaluating subsequent changes in 2024 and beyond.

The theme intensity heatmap depicting the relative strength and frequency of key dimensions associated with the teacher–child relationship in Attappadi during 2022 is shown in Figure 5.

Figure 5

Theme Intensity Heatmap- Teacher- Child- Relationship Dimension (2022)



As per the Figure 4 illustrates the intensity of thematic emphasis across five dimensions of the Teacher–Child Relationship (2022) in Attappadi. The brightest area, Emotional and Social Support, shows the strongest presence in teacher narratives, indicating teachers’ deep emotional involvement with students. Pedagogical Engagement and Cultural Responsiveness follow, reflecting moderate attention to instructional methods and cultural inclusion. Lower intensities in Inclusivity and Participation and Classroom Environment and Safety suggest weaker institutional focus on equity and learning conditions. Overall, the heatmap reveals that pre-LSDGs teacher–child relationships were emotionally driven but structurally under-supported, highlighting the need for systemic inclusivity and safety improvements.

Summary and Interpretation

Before LSDGs, teachers relied on empathetic bonds and occasional home visits to sustain engagement, but systemic support was limited. Pedagogical engagement occurred through sporadic activity-based strategies (storytelling, drawing, peer support) constrained by time, facilities, and materials. Cultural

touchpoints (folk stories, Irula songs) strengthened rapport yet lacked structured curricular integration. Inclusivity was challenged by multi-grade classes, language barriers, and first-generation learner dynamics, making individualized support ad hoc. Physical and digital environments (crowded rooms, power cuts, no ICT/playgrounds) curtailed safe, stimulating learning spaces. Taken together, teacher–child relationships were strong in affective terms but under-leveraged for systematic learning gains—highlighting gaps against SDG 4 targets on inclusive, equitable learning with effective environments.

The 2022 baseline indicates resilient relational commitment by teachers amid resource scarcity. Strengths lie in empathy and cultural rapport; priority improvements include structured parent engagement, regularized experiential learning, targeted inclusion supports, and foundational ICT/environment upgrades. These insights clarify where LSDGs interventions can focus to convert relational goodwill into consistent, equitable learning outcomes for students from tribal community in Attappadi.

Status of quality education among students from tribal community in Attappadi based on SDGs framework with respect to Teachers’ Relationship with Children after the implementation of LSDGs

Teacher–child relationships are foundational to SDG 4’s commitment to inclusive and equitable quality education. In Adivasi contexts like Attappadi, relational trust and cultural relevance are prerequisites for sustained participation and learning. Following LSDGs implementation (2022–2024), schools prioritized data-informed support, participatory pedagogy, ICT tools, and structured home–school

engagement. This report focuses on teachers’ 2024 perspectives to document how relationships with children reflect Post-LSDGs quality improvements.

To ensure the credibility and dependability of the findings, multiple strategies were integrated throughout the analytic process. Analyst triangulation was employed by systematically cross-checking teacher narratives with the corresponding checklist tallies, enabling validation of both reported practices and observed frequencies. An audit trail was maintained, documenting coding decisions, theme development, revisions, and analytical memos to enhance transparency and allow replicability. Negative case analysis was also incorporated by actively identifying and examining divergent or contradictory instances—such as situations where pedagogical intentions were constrained by infrastructural limitations like intermittent digital connectivity. These procedures collectively strengthened the confirmability and overall trustworthiness of the qualitative interpretations.

Thematic and Dimension-Wise Analysis

Table 35 summarizes themes; figures visualize lexical salience, network structure, frequency, intensity, and relational flow.

Table 35

Thematic Summary – Teachers’ Relationship with Children (2024)

SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Theme 1 – Strengthened Emotional Bonds (mentoring, confidence)	Emotional and Social Support	Teachers report deeper trust and regular mentoring that stabilize participation and confidence.	“Each teacher mentors five children”; “withdrawn child now

				confidently presents”
2	Theme 2 – Interactive & participatory pedagogy	Pedagogical Engagement	ICT-enabled, project-based, and small-group activities increase engagement and student voice.	“interactive quizzes on smart boards”; “mapping local flora; garden projects”
3	Theme 3 – Cultural integration as pedagogy	Cultural Responsiveness	Tribal songs, arts, and bilingual materials (Malayalam/Irula) are consciously integrated.	“tribal art exhibitions”; “bilingual materials in Malayalam and Irula”
4	Theme 4 – Inclusion through targeted support	Inclusivity and Participation	Bridge courses, individual support plans, and mixed-ability groups reduce barriers for slow/first-gen learners.	“bridge courses for slow learners”; “individual support plans”
5	Theme 5 – Joyful, equitable classroom climate	Classroom Environment & Learning Climate	Regular co-curriculars, equity measures, and recognition (medals/incentives) create a safe, engaging space.	“weekly arts/sports”; “uniforms, meals, scholarships on time”
6	Theme 6 – Parents as co-educators	Parent–Teacher Collaboration	WhatsApp/PTA and home visits normalize shared responsibility and trust.	“parents more involved through WhatsApp”; “regular PTA meetings”
7	Theme 7 – ICT mainstreaming	ICT Integration	Digital records, tablets, and smart boards enhance monitoring, visualization, motivation.	“Samagra portal; tablets; smart boards”; “children record videos of lessons”
8	Theme 8 – Experiential learning normalized	Experiential Learning	Field trips, eco-clubs, nature trails, and local projects connect learning to life and livelihoods.	“visit farms to study biodiversity”; “forest trails for science”

As per the Table 35 describes the thematic summary of teachers' relationships with children in Attappadi (2024), reflecting a transformative shift following the implementation of the Localized Sustainable Development Goals (LSDGs) framework. The findings indicate that education has evolved toward a more inclusive, interactive, and culturally grounded model. Teachers report stronger emotional and social bonds, with mentoring and confidence-building activities enhancing student well-being. Pedagogy has become more participatory and technology-supported, emphasizing ICT use, project-based learning, and experiential approaches such as field visits and eco-clubs. Cultural responsiveness has deepened through the integration of tribal arts, bilingual instruction, and community heritage. Targeted interventions now support inclusivity, addressing diverse learning needs. Additionally, improved classroom environments, strengthened parental collaboration, and the mainstreaming of digital tools have fostered equity, engagement, and shared accountability. Overall, the 2024 context demonstrates a systemic improvement where emotional connection, pedagogy, culture, and technology converge to enhance learning quality and participation.

Emotional and Social Support

Teachers mentor specific children, monitor wellbeing, and report visible gains in confidence and voice.

Pedagogical Engagement

Interactive ICT-supported lessons, project-based tasks, and small-group work increase participation and ownership.

Cultural Responsiveness

Tribal arts, songs, and bilingual materials make learning relevant and identity-affirming.

Inclusivity and Participation

Bridge courses and individualized plans reduce barriers for slow/first-gen learners; mixed-ability grouping fosters inclusion.

Classroom Environment & Learning Climate

Regular co-curriculars and timely equity provisioning create a joyful, equitable climate.

Parent–Teacher Collaboration

WhatsApp/PTA formalize feedback loops; home visits sustain trust in remote hamlets.

ICT Integration

Samagra portal, tablets, and smart boards enable monitoring, visualization, and motivation despite connectivity limits.

Experiential Learning

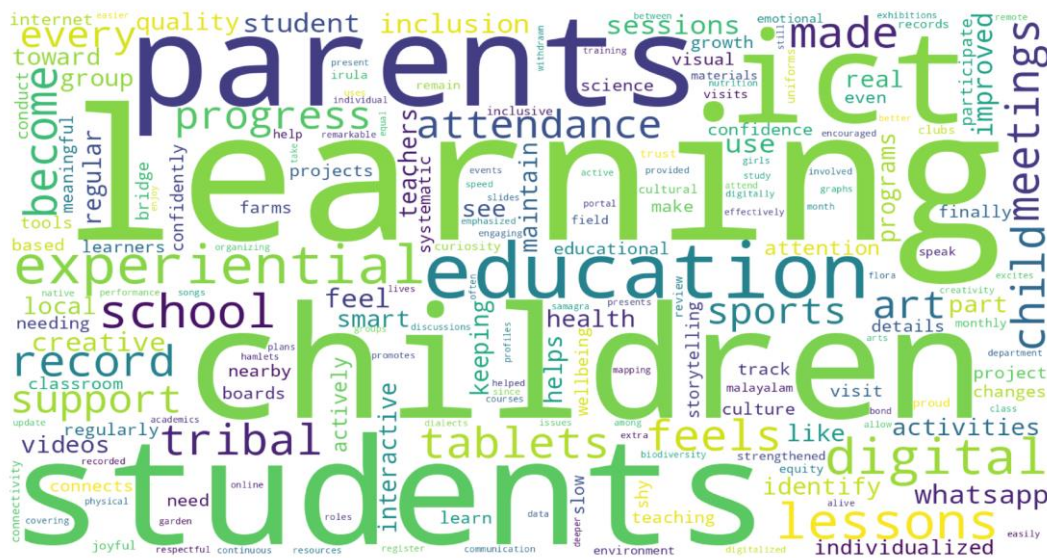
Field visits, eco-clubs, and garden projects connect knowledge to local livelihoods and environment.

Graphical Representations

The graphical representations that follow visually summarize the qualitative patterns and thematic relationships identified in teachers' narratives from 2024, reflecting the Post-LSDGs transformation in the teacher-child dynamic within Attappadi's tribal schools. Figure 6 represents the word Cloud of the Teacher relationship 2024.

Figure 6

Word Cloud – Key Terms (Teachers' Relationship 2024)



The word cloud visually represents the dominant themes and frequency of key concepts from teacher narratives in 2024, illustrating the transformative shift in the teacher–child relationship following the implementation of the Localized Sustainable Development Goals (LSDGs) in Attappadi. The most prominent words “learning,” “students,” “children,” “parents,” and “education”—indicate a holistic and collaborative focus on student development. Frequent terms such as “ICT,” “tablets,”

“digital,” “interactive,” and “experiential” reflect the growing integration of technology and experiential learning in classrooms.

The visibility of “tribal,” “art,” “sports,” and “creative” suggests culturally grounded and inclusive pedagogical practices. Additionally, the recurring mention of “support,” “attendance,” “record,” and “meetings” underscores systematic monitoring and strengthened parental engagement through digital platforms like WhatsApp. Overall, the visualization captures a data-informed, technologically enabled, and emotionally connected educational environment, marking significant progress toward SDG 4 goals of inclusive, equitable, and quality education in the tribal context. Figure 7 presents the thematic network illustrating interconnected dimensions defining the strengthened teacher–child relationship in Attappadi during 2024 is given below.

Figure 7

Thematic Network – Teacher–Child Relationship (2024)

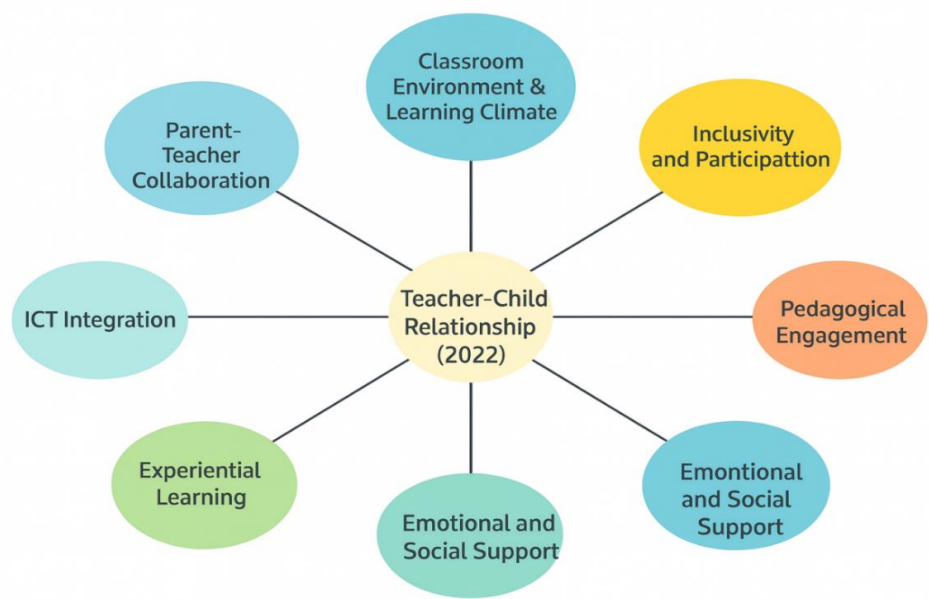
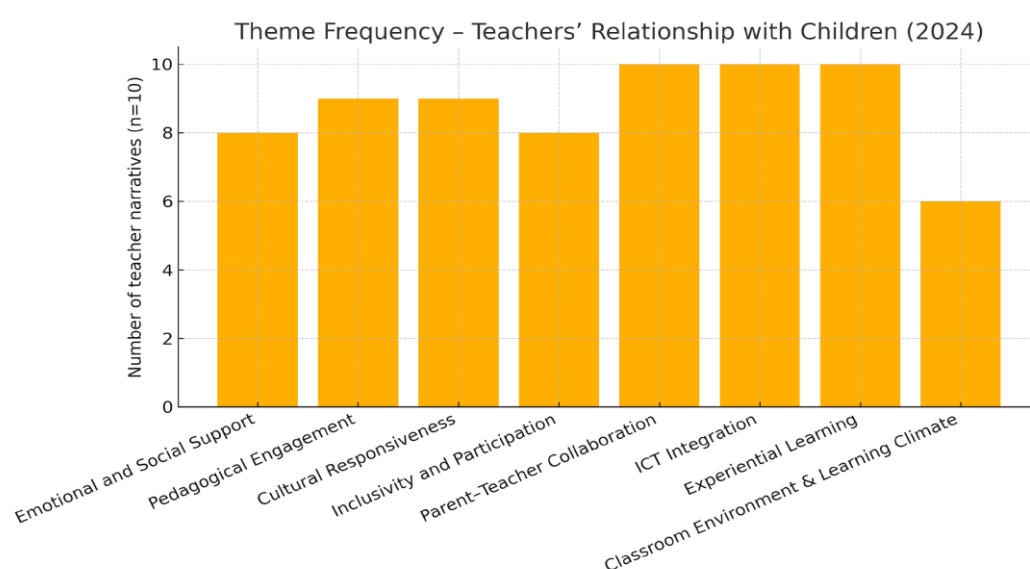


Figure 6 illustrates the thematic network of the Teacher–Child Relationship (2024), highlighting the multidimensional nature of educational interactions in post-LSDGs Attappadi. The central node represents the strengthened teacher–child relationship, supported by eight interlinked dimensions: Emotional and Social Support, Pedagogical Engagement, Cultural Responsiveness, Inclusivity and Participation, Classroom Environment and Learning Climate, Parent–Teacher Collaboration, ICT Integration, and Experiential Learning. These interconnected themes demonstrate a shift toward holistic, participatory, and technology-enabled education, emphasizing emotional care, cultural grounding, and active parental involvement. The network signifies how the LSDGs framework has institutionalized teacher efforts into a systemic model of inclusive and sustainable educational practice. Figure 8 is given below presents the theme frequency bar chart illustrating the distribution of key dimensions in teachers’ relationship with children during 2024.

Figure 8

Theme Frequency Bar Chart – Teachers’ Relationship with Children (2024)



The bar chart illustrates the frequency of key themes identified in teachers' narratives about their relationships with children in Attappadi during 2024, following LSDGs implementation. The highest frequencies appear in ICT Integration, Experiential Learning, and Parent–Teacher Collaboration, indicating a significant shift toward technology-enabled and community-engaged education. Pedagogical Engagement and Cultural Responsiveness also feature prominently, reflecting participatory and culturally rooted teaching practices. Moderate attention to Emotional and Social Support and Inclusivity shows continued care and efforts toward equity. The lowest frequency in Classroom Environment and Learning Climate suggests that infrastructural improvements still lag behind pedagogical advances. The chart reflects a holistic, technology-supported, and collaborative learning transformation in 2024.

Summary and Interpretation

Post-LSDGs, teacher–child relationships in Attappadi are characterized by deeper trust, structured mentoring, and inclusive, culturally grounded pedagogy. Digital tools support early identification and ongoing monitoring; participatory and experiential methods anchor learning in local realities. Parent partnership has transitioned from episodic to continuous. Constraints—intermittent connectivity, device upkeep, and limited budgets for trips—persist, but the overall trajectory is toward institutionalized, SDG 4–aligned practice.

Status of quality education among students from tribal community in Attappadi based on SDGs framework with respect to Teachers' Relationship with Children Before and after the implementation of LSDGs

Background & Rationale. Teacher–student relationships are central to SDG 4's aim for inclusive and equitable quality education. In Attappadi's Adivasi context, relational trust, cultural relevance, and supportive environments are key to participation and learning continuity. The LSDGs (2022–2024) introduced localised monitoring, ICT tools, and community engagement intended to improve these conditions.

Objectives. (i) Document the 2022 baseline of teacher–child relationships; (ii) Analyze 2024 post-LSDGs practices; (iii) Compare qualitative shifts; (iv) Prepare scaffolded templates for integrating consultative-meeting insights when available.

Data Sources & Tools. Category I: Tool for Teacher's Relationship with Children (Part A checklist; Part B 7-dimension guide) and teacher narratives from 2022 and 2024. Consultative-meeting datasets were not provided at this time; therefore, Section B contains templates for future insertion.

Teachers' Responses of the Status During 2022 (Before LSDGs Implementation)

Thematic summary: relationships relied on personal trust amid systemic constraints—manual record-keeping, ad-hoc inclusion, sporadic arts/sports, rare field trips, limited parent communication, material deprivation, and near-absent ICT. Illustrative excerpts highlight teachers' empathy and home visits, contrasted with

infrastructural limits. Table 36 shows the Code–Theme–Excerpt–Item Summary (Teachers 2022).

Table 36

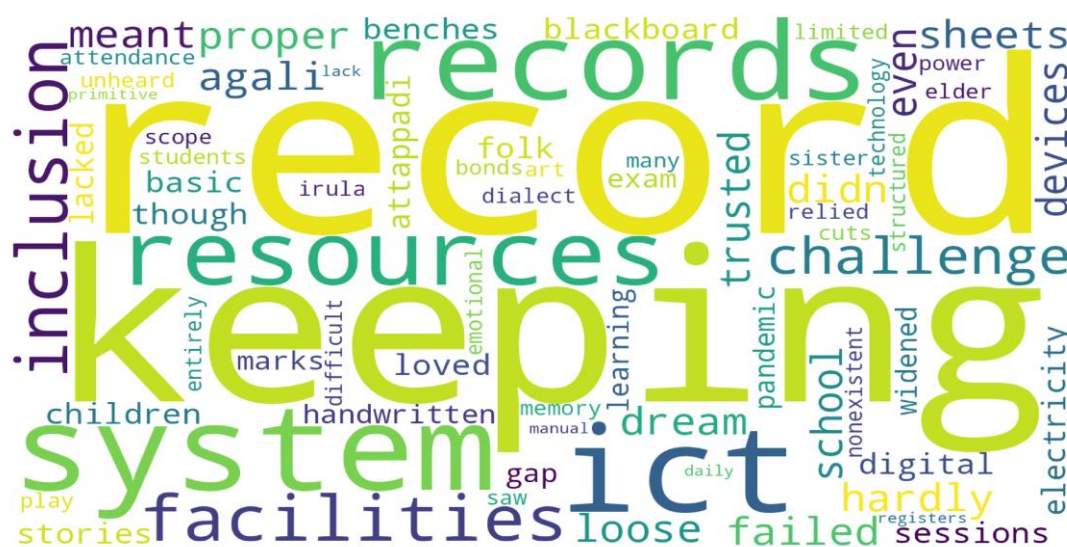
Table 36 Code–Theme–Excerpt–Item Summary (Teachers 2022)

Code	Theme	Item	Excerpt
C1-Records	Manual/irregular records	Record Keeping & Monitoring	proper record system nothing about home background or health
C2-Comm	Infrequent parent updates	Parent–Teacher Collaboration	Communication informal and infrequent
C3-Remedial	Minimal remedial support	Individualized Attention & Inclusion	support depended on memory after-class help only
C4-Arts	Rare arts/sports events	Holistic Development	limited to Independence Day; no playground
C5-Experiential	Few field trips; improvised materials	Experiential Learning	field trips impossible; storytelling under a tree
C6-Equity	Poverty affects participation	Access & Equity	children came hungry or without shoes
C7-ICT	No ICT access or training	ICT Integration	no computer/printer; power cuts

Table 36 presents the Code–Theme–Excerpt–Item Summary derived from teacher narratives in 2022, capturing the pre-LSDGs educational realities in Attappadi. The data reveal significant gaps in record keeping, parental communication, remedial instruction, and holistic development. Teachers reported irregular documentation, infrequent parent engagement, and minimal individualized support for struggling learners. Opportunities for arts, sports, and experiential learning were scarce, largely due to poor infrastructure and resource constraints. Widespread poverty and lack of ICT access further deepened inequities, affecting participation and

Figure 9

Word Cloud – Key Terms (Teachers 2022)



As per the word cloud illustrates the dominant terms and recurring concerns expressed by teachers in Attappadi during 2022, prior to LSDGs implementation. The most prominent words “record,” “keeping,” “system,” “resources,” “facilities,” and “ICT”—highlight systemic deficiencies in educational infrastructure and monitoring mechanisms. Frequent mentions of “inclusion,” “challenge,” “basic,” and “school” indicate the struggle to provide equitable learning opportunities amid material scarcity. Terms such as “manual,” “handwritten,” and “nonexistent” reflect outdated record-keeping and the absence of digital tools. Overall, the visualization portrays a pre-LSDGs context marked by resource deprivation, weak institutional systems, and technological exclusion, underscoring the urgent need for structured reform and capacity development. In Figure 10. Represents the Thematic Network of the Teachers response 2022

Figure 10

Thematic Network (Teachers 2022)

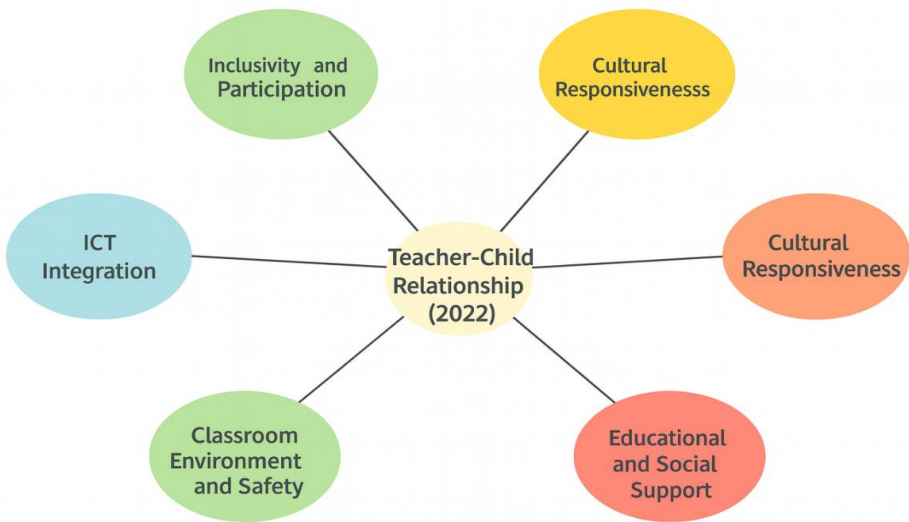


Figure 9 illustrates the thematic network of teachers' perspectives in 2022, depicting the interconnected dimensions that shaped the Teacher–Child Relationship in Attappadi before LSDGs implementation. The central theme is surrounded by seven sub-themes—Record Keeping and Monitoring, Individualized Attention and Inclusion, Holistic Development, Parent–Teacher Collaboration, Experiential Learning, ICT Integration, and Access and Equity. These dimensions reflect a system struggling with limited institutional support, weak communication, minimal inclusivity, and infrastructural deficits. The network highlights that teacher–student interactions relied largely on individual commitment rather than structured frameworks, revealing a fragmented educational environment that underscored the need for systemic reform and policy-driven support.

Status During 2024 (After LSDGs Implementation)

Post-LSDGs, teachers report structured mentoring, digital monitoring (Samagra), interactive ICT-enabled pedagogy, routine cultural integration, enhanced parent partnerships, and normalized experiential learning—tempered by connectivity and logistics constraints. In the Table 37 Represents the Code of the Theme–Excerpt–Item Summary (Teachers 2024).

Table 37*Code–Theme–Excerpt–Item Summary (Teachers 2024)*

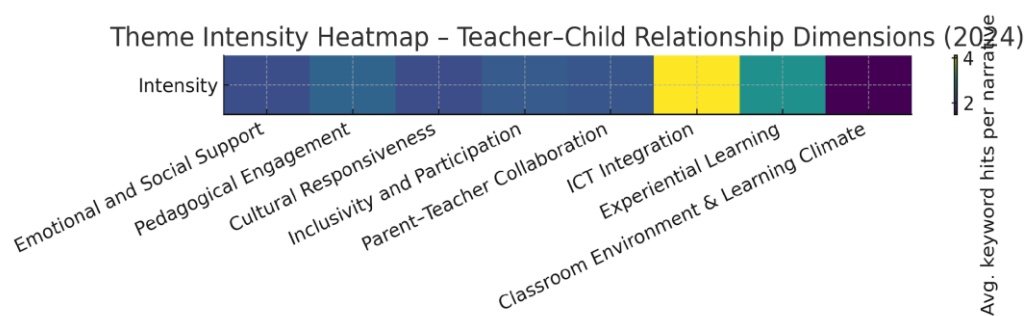
Code	Theme	Item	Excerpt
T1-Emotional	Strengthened bonds; mentoring	Emotional & Social Support	withdrawn child now confidently presents
T2-Pedagogy	Interactive & participatory	Pedagogical Engagement	interactive quizzes; project-based tasks
T3-Culture	Cultural integration	Cultural Responsiveness	Irula/tribal arts & songs in lessons
T4-Inclusion	Targeted support; bridge courses	Inclusivity & Participation	individual support plans; small groups
T5-Climate	Joyful equitable classroom	Environment & Climate	regular arts/sports; timely equity provisioning
T6-Parents	Parents as co-educators	Parent–Teacher Collaboration	WhatsApp/PTA; regular reviews
T7-ICT	ICT mainstreamed	ICT Integration	Samagra portal; tablets; smart boards
T8-Experiential	Experiential normalized	Experiential Learning	field/nature/eco clubs

As per the Table 36 shows the emotional bonds and mentoring support that boost confidence among previously withdrawn students. Pedagogy has become more interactive, integrating project-based and participatory learning. Cultural responsiveness is achieved through the inclusion of Irula art, songs, and local heritage within lessons, promoting identity affirmation. Targeted bridge courses enhance inclusivity, while joyful classroom climates emphasize equity through arts and sports. Parental involvement has deepened, with parents now acting as co-educators via regular WhatsApp and PTA engagements. ICT has been mainstreamed through the Samagra portal, tablets, and smart boards, improving access and engagement. Finally,

experiential learning through field, nature, and eco clubs normalizes contextual, hands-on education.

A graphical representation is given in Figure 11. Theme Intensity Heatmap (Teachers 2024) is given below

Figure 10
Theme Intensity Heatmap (Teachers 2024)



The Figure 10 illustrates the relative intensity of thematic engagement within teacher–child relationship dimensions in 2024, following LSDGs implementation. The highest intensity is observed in ICT Integration and Experiential Learning, reflecting how technology and hands-on activities became central to classroom interaction. Teachers increasingly use tablets, smart boards, and digital platforms to foster participation and creativity. Emotional and Social Support and Pedagogical Engagement also show strong representation, highlighting teachers’ focus on nurturing confidence and encouraging collaborative, inquiry-based learning. Cultural Responsiveness and Inclusivity register moderate intensity, indicating consistent integration of tribal culture and equitable participation strategies. Parent–Teacher Collaboration and Learning Climate appear comparatively lower, suggesting steady but less frequent emphasis in narratives. The visualization demonstrates a Post-

LSDGs shift toward dynamic, technology-enhanced, emotionally supportive, and experiential teaching practices that strengthen both learning quality and relationships between teachers and students from tribal community in Attappadi.

Comparative Analysis: Teachers 2022 vs 2024

The comparative analysis of teachers' responses between 2022 and 2024 highlights the transformative impact of the LSDGs implementation on teaching practices, student engagement, and classroom environments in Attappadi. The table illustrates a clear evolution from traditional, manual, and fragmented approaches to structured, inclusive, and technology-supported systems. Teachers' roles have expanded from routine instruction to active mentoring, while schools have shifted toward holistic, digitally monitored, and experiential learning frameworks. The integration of ICT, improved parental involvement, and strengthened inclusion mechanisms collectively indicate a systemic enhancement in the quality and equity of education, aligning with the objectives of SDG 4. Table 38 presents the comparative theme matrix, highlighting the year-wise progression of various educational themes between 2022 and 2024.

Table 38*Comparative Theme Matrix – Teachers (2022 vs 2024)*

Dimension	2022 Status	2024 Status	Observed Change
Record/Monitoring	Manual, incomplete	Digital (Samagra), comprehensive	Early identification improves support
Inclusion/Support	Ad-hoc, memory-based	Structured mentoring, bridge courses	Participation and confidence rise
Holistic dev.	Sporadic events	Regular arts/sports, clubs	Confidence & teamwork improve
Parent link	Event-based, rare	WhatsApp/PTA routine	Shared responsibility increases
Experiential	Field trips rare	Field/nature projects routine (logistics cap)	Relevance & curiosity increase
Access/Equity	Material deprivation visible	Timely materials, meals, scholarships	Attendance stability improves
ICT	Absent/minimal	Smart boards/tablets/videos (patchy net)	Engagement & monitoring better

Comparative Theme Matrix – Teachers (2022 vs 2024)

In the case of Record and Monitoring, schools evolved from incomplete manual records to comprehensive digital systems using Samagra, enabling early identification and personalized support. Inclusion and Support improved through structured mentoring and bridge courses, fostering greater student confidence and participation. Holistic Development expanded from sporadic activities to regular arts, sports, and club engagements, nurturing teamwork and creativity. Parent–Teacher Linkages transformed from occasional events to continuous collaboration via WhatsApp and PTA, promoting shared responsibility. Experiential Learning became integral, emphasizing field and nature-based projects that enhanced curiosity and relevance. Access and Equity strengthened through timely provision of materials,

meals, and scholarships, stabilizing attendance. Finally, ICT Integration advanced from minimal use to smart classrooms and digital learning tools, improving engagement and progress monitoring. Figure 12 Word Cloud – Comparative Improvements (Teachers 2022 Vs 2024).

Figure 12

Word Cloud – Comparative Improvements (Teachers 2022 Vs 2024)

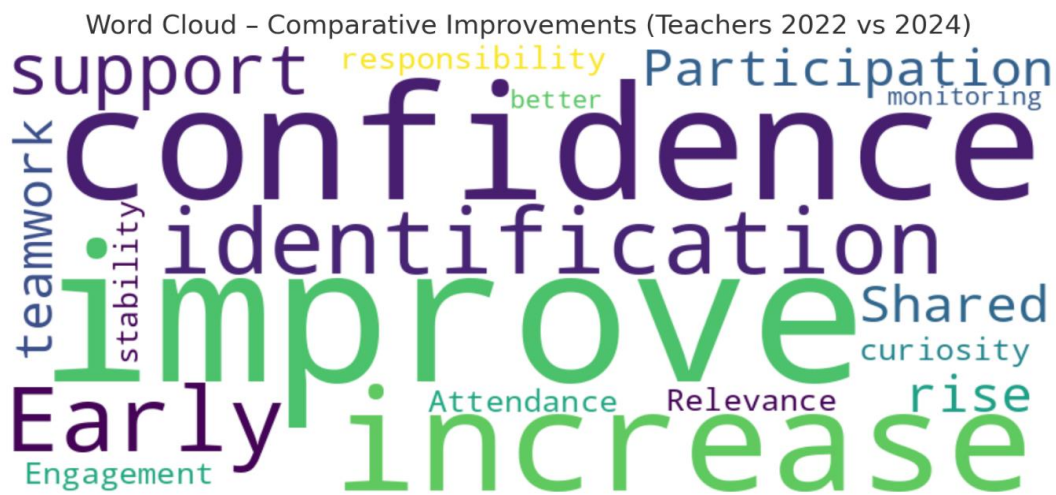


Figure 12 Word Cloud – Comparative Improvements (Teachers 2022 Vs 2024). The size of each word indicates its frequency and prominence in teacher responses

Figure 13 presents the Narrative Flow Diagram of Teachers' Experience Journey, illustrating the progression of teaching practices and engagement patterns between 2022 (pre-LSDGs) and 2024 (post-LSDGs).

Figure 13

Narrative Flow Diagram (Teachers' Experience Journey)

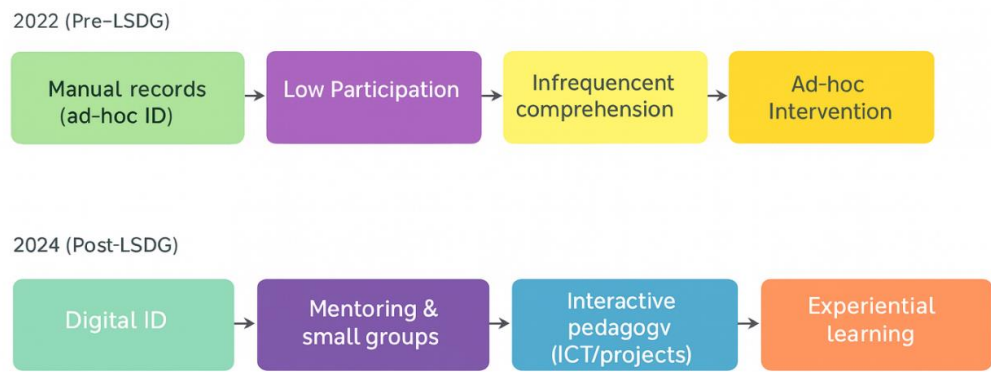


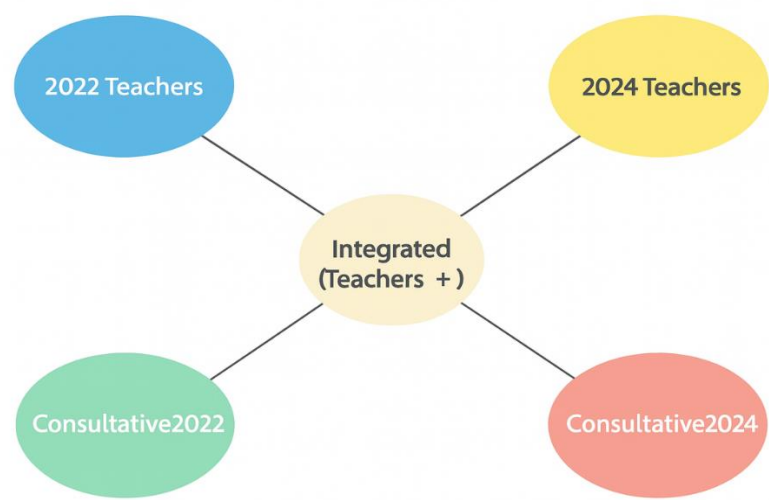
Figure 13. Narrative Flow Diagram (Teachers' Experience Journey, 2022 vs 2024) illustrates the transformation in teachers' professional practices and classroom engagement following the implementation of LSDGs. In 2022, teaching practices were largely manual and ad hoc, characterized by limited classroom activities, infrequent parent communication, and irregular follow-up with students. By contrast, the 2024 post-LSDGs phase demonstrates a shift toward structured, technology-enabled, and participatory approaches

Cross-Category Synthesis

Teacher data show strong post-LSDGs gains across inclusion, pedagogy, culture, ICT, and parent partnership. Once consultative-meeting data are integrated, this section should triangulate how policy and stakeholder processes enabled (or constrained) these classroom shifts (e.g., budget lines for ICT/fieldwork, PTA/PTG norms, panchayat resolutions). Figure 14. Integrated Thematic Network (Teachers + Consultative Data) Template is given below.

Figure 14

Integrated Thematic Network (Teachers + Consultative Data)



The diagram shows how teacher and consultative insights from 2022 and 2024 converge into one integrated understanding of learning quality. Earlier challenges and emerging strengths are combined to provide a comprehensive, multi-stakeholder perspective. This integration highlights progress over time and the increasing alignment between classroom practices and community-led consultative processes.

Discussion and Interpretation

The comparative analysis indicates a qualitative transition from reactive, resource-poor conditions (2022) to more systematic, inclusive, and engaging practices (2024). LSDGs appears to have catalyzed data-driven identification (Samagra), formalized mentoring, and strengthened cultural and experiential relevance. Remaining constraints—connectivity, device upkeep, and logistics—should be explicitly addressed in LSDGs workplans to consolidate gains. Post-LSDGs, teacher–

child relationships better align with SDG 4: classrooms are more inclusive, culturally grounded, and participatory.

Major recommendations are given in the following (1) Invest in reliable internet and ICT maintenance; (2) Allocate recurring funds for experiential learning; (3) Expand bilingual/inclusive PD; (4) Institutionalize mentoring & parent-partnership SOPs; (5) Add relational and inclusion indicators to school quality dashboards.

Status of quality education among students from tribal community in Attappadi based on SDGs framework with respect to Learning Quality of Children before the implementation of LSDGs

Attappadi tribal communities faced pandemic-related setbacks, socio-linguistic barriers, and resource constraints that impacted learning continuity. This baseline captures pre-LSDGs realities to inform subsequent comparative analysis. Thematic and dimension-wise coding across Pedagogical Effectiveness; Student Engagement & Participation; Learning Outcomes & Assessment; Inclusivity & Equity; Resource Availability & Infrastructure; Teacher Competence & Support; Classroom Environment & Innovation.

Thematic and Dimension-Wise Analysis

Table 39 presents the thematic summary with representative excerpts from teacher narratives.

Table 39

Thematic Summary – Teachers: Learning Quality of Children before the implementation of LSDGs (2022)

SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Theme 1 – Traditional Teaching Methods	Pedagogical Effectiveness	Learning dominated by lecture/rote; limited activity-based methods.	“Copying dominated writing... reading aloud without comprehension.”
2	Theme 2 – Low Student Engagement	Student Engagement & Participation	Participation suppressed by language barriers, fatigue, and fear of mistakes.	“Students hesitated to speak; Irula-to-Malayalam transition was hard.”
3	Theme 3 – Limited Assessment Systems	Learning Outcomes & Assessment	No continuous assessment tools; identification of needs was ad hoc.	“Anecdotal records only; difficult to track progress.”
4	Theme 4 – Barriers to Inclusion	Inclusivity & Equity	First-generation learners; irregular attendance from remote hamlets; socio-linguistic barriers.	“Parents illiterate; Malayalam felt alien.”
5	Theme 5 – Scarce Learning Resources	Resource Availability & Infrastructure	Poorly equipped libraries; few storybooks; limited teaching aids/digital tools.	“Library barely functioned; old torn books only.”
6	Theme 6 – Limited Teacher Support	Teacher Competence & Support	Minimal training in phonics/early literacy; multi-grade burden; weak peer-support systems.	“No refresher programs; exhausting multi-grade teaching.”
7	Theme 7 – Low Innovation Climate	Classroom Environment & Innovation	Innovation emerged informally (story circles, diaries) but not institutionalized.	“Personal diaries and folk tales helped, but practices were sporadic.”

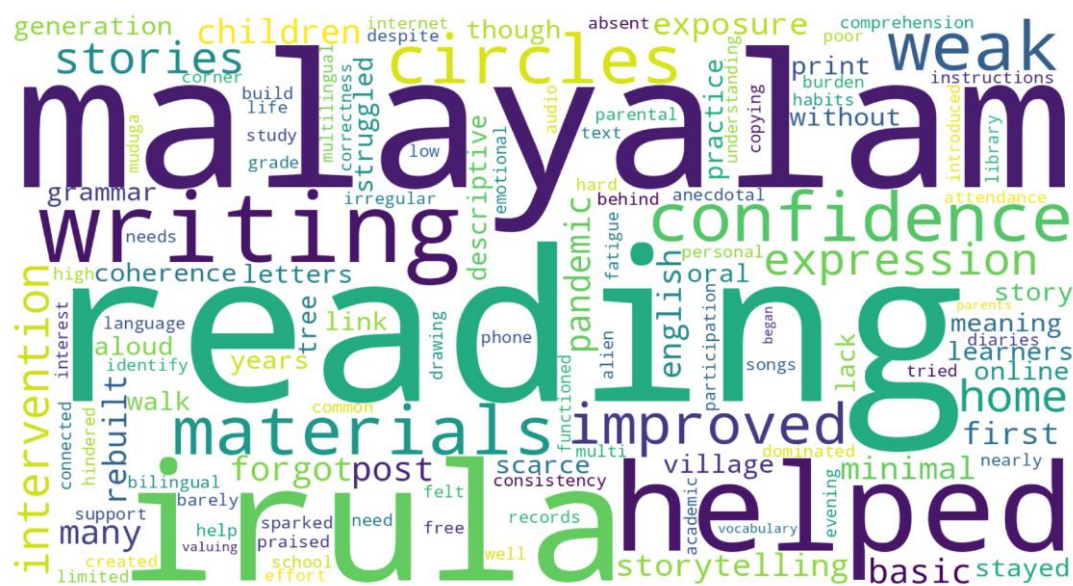
Table 39 presents the thematic analysis of teachers’ responses from 2022, reflecting the status of learning quality among students from tribal community in Attappadi before the implementation of LSDGs. The findings reveal a predominantly traditional education environment characterized by limited pedagogical innovation

and constrained resources. Teaching was largely lecture-based, with minimal activity-oriented learning, leading to low student engagement—particularly among first-generation learners facing language and socio-cultural barriers. Assessment mechanisms were informal and inconsistent, relying on anecdotal observations rather than systematic evaluation. The lack of adequate learning materials, insufficient teacher training, and minimal institutional support further weakened classroom effectiveness. Although some teachers initiated creative practices like storytelling and diaries, these efforts remained isolated rather than institutionalized. A graphical representation is given in Figure 15

Showing the Word Cloud – Key Terms Reflecting Learning Quality (Teachers 2022)

Figure 15

Word Cloud – Key Terms Reflecting Learning Quality (Teachers 2022)



Word Cloud – Key Terms Reflecting Learning Quality (Teachers 2022)

A graphical representation is given in Figure 16. Thematic Network – Learning Quality Dimensions (Teachers 2022) is given below

Figure 16

Thematic Network – Learning Quality Dimensions (Teachers 2022)

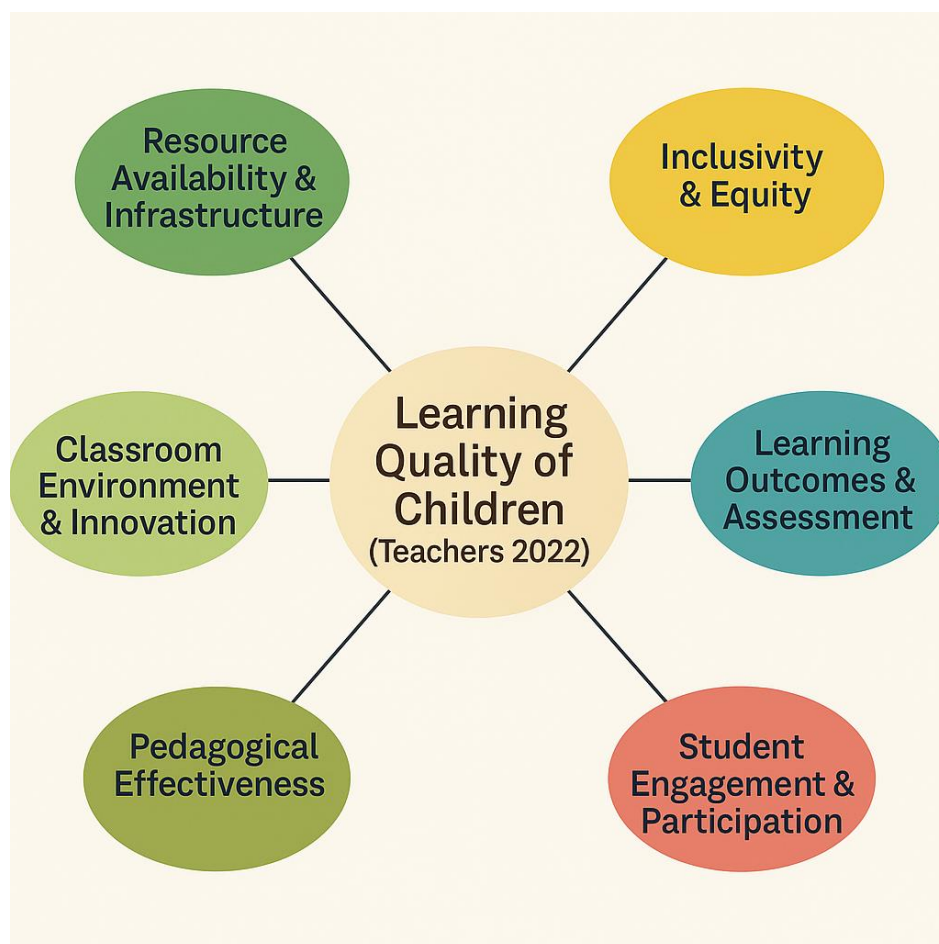


Figure 16 explains the Thematic Network of Learning Quality Dimensions (Teachers 2022), illustrating the interconnections among key factors that influenced educational quality before the implementation of LSDGs. The central theme, Learning Quality of Children, is surrounded by seven primary dimensions: Pedagogical Effectiveness, Student Engagement and Participation, Learning Outcomes and

Assessment, Inclusivity and Equity, Resource Availability and Infrastructure, Teacher Competence and Support, and Classroom Environment and Innovation.

These dimensions collectively reflect the systemic nature of educational challenges faced in 2022. Weak pedagogical practices and low student participation were compounded by inadequate resources, insufficient teacher training, and the absence of structured assessment mechanisms. Furthermore, barriers to inclusivity and the lack of an innovative classroom culture constrained holistic learning.

Consultative Meeting Reports – Learning Quality of Children (2022)

Stakeholder Perspectives Before LSDGs Implementation

Consultative-meeting data were not provided. The following table and figures are templates to be populated when stakeholder inputs are available. As per the Table 40 Code–Theme–Excerpt–Item Summary (Consultative 2022) is given below.

Table 40

Code–Theme–Excerpt–Item Summary (Consultative 2022)

SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective
1	Theme 1 – Lack of Learning Monitoring	Assessment Practices	No standardized system for tracking learning achievements.
2	Theme 2 – Resource Gaps	Infrastructure & Access	Insufficient materials and digital resources hindered learning.
3	Theme 3 – Teacher Constraints	Teacher Support	Limited training opportunities for innovative methods.

Table 39 presents the thematic analysis of consultative meeting responses from 2022, outlining key systemic and institutional challenges affecting the quality of

education in Attappadi before the implementation of LSDGs. Three primary themes emerge from the analysis.

Theme 1 – Lack of Learning Monitoring: Consultative participants highlighted the absence of standardized mechanisms to track and evaluate students' learning progress. Assessment practices were inconsistent and relied heavily on anecdotal observations, limiting data-driven decision-making.

Theme 2 – Resource Gaps: The discussions revealed significant deficiencies in physical and digital infrastructure. Schools lacked adequate learning materials, teaching aids, and technological resources, which constrained interactive and experiential learning.

Theme 3 – Teacher Constraints: Limited professional development opportunities were noted, with teachers having minimal exposure to modern pedagogical approaches or peer-learning platforms. This lack of support hindered innovation and adaptation to diverse student needs.

As per the Figure 17 showing the Stakeholder Concern Map – Learning Barriers (2022) is given below.

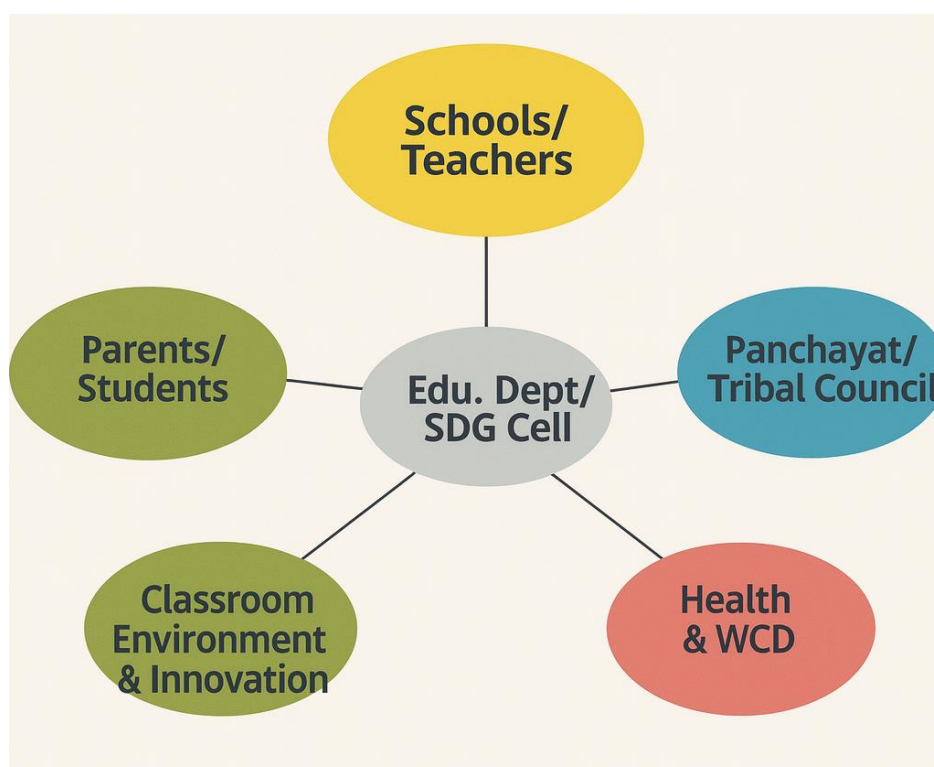
Figure 17*Stakeholder Concern Map – Learning Barriers (2022)*

Figure 17 explains the Stakeholder Concern Map highlighting the fragmented communication and coordination among key actors involved in education delivery in Attappadi before the implementation of LSDGs. The diagram shows that while schools and teachers were central to learning activities, their interactions with other stakeholders—such as parents, Panchayats, NGOs, and government departments—were limited and unstructured.

Integrated Synthesis: Learning Quality of Children (Pre-LSDGs 2022)

Table 41 summaries dimension-wise insights combining teacher evidence and consultative placeholders.

Table 41*Dimension-Wise Summary – Learning Quality Before LSDGs (2022)*

SL No.	Dimension	Key Themes	Summary Based on Research Objective
1	Pedagogical Effectiveness	Traditional methods, rote learning	Lack of innovation limited comprehension and critical thinking.
2	Student Engagement & Participation	Low participation, absenteeism	Language barriers and fear reduced active learning.
3	Learning Outcomes & Assessment	Poor assessment systems	No structured progress tracking; gaps unaddressed.
4	Inclusivity & Equity	Tribal linguistic & socio-economic disparities	Remote hamlet access barriers and first-generation learners.
5	Resource Availability & Infrastructure	Scarce materials and ICT tools	Classrooms lacked aids for experiential learning.
6	Teacher Competence & Support	Minimal training/support systems	Struggled to adapt to diverse needs; multigrade burden.
7	Classroom Environment & Innovation	Low institutionalized innovation	Good practices existed but were sporadic and informal.

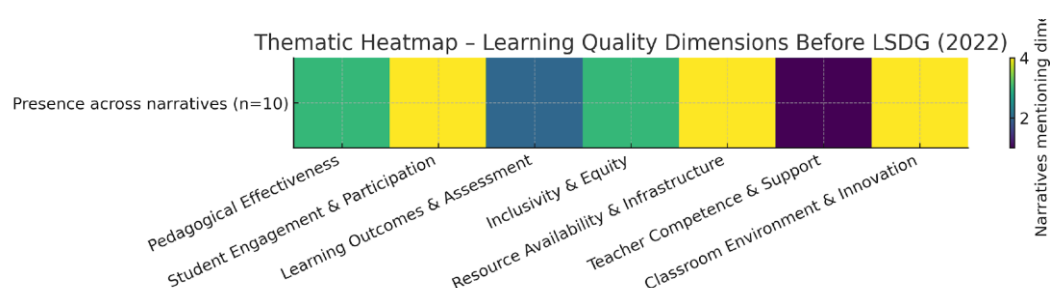
A dimension-wise overview of Attappadi learning quality prior to the LSDGs's establishment is given in Table 40, which shows a system characterized by poor engagement, traditional pedagogy, and little institutional support. Conceptual understanding and critical thinking were not given much attention in favor of rote memorization in the classroom. Due to first-generation learners' lack of confidence, absenteeism, and language barriers, student involvement was low. Learning gaps remained because progress monitoring was hampered by the lack of structured assessment frameworks. The lack of ICT resources and inadequate infrastructure in classrooms hampered opportunities for experiential learning. Teachers struggled with teaching several grades and had no access to peer assistance or training. Even while

certain cutting-edge methods, such as storytelling and folk-based education, developed informally, they were not formalized.

As per the Figure 18 Thematic Heatmap – Learning Quality Dimensions Before LSDGs (2022) is given below.

Figure 18

Thematic Heatmap – Learning Quality Dimensions Before LSDGs (2022)



The distribution and intensity of important learning quality variables found in 2022 teacher narratives prior to the LSDGs's adoption are shown in Figure 18. Pedagogical Effectiveness, Student Engagement, Inclusivity and Equity, and Classroom Environment and Innovation were the most often reported aspects, indicating main areas of concern, according to the heatmap. Teacher Competence and Support, on the other hand, displayed the lowest intensity, indicating a lack of institutional support and professional development. As the foundation for subsequent LSDGs changes, the graphic highlights a disjointed educational landscape where teaching methods lacked creativity, evaluation systems were inadequate, and learning experiences were limited by infrastructure issues.

Discussion and Interpretation

The 2022 baseline points to systemic reliance on rote pedagogy, low participation, weak assessment mechanisms, resource scarcity, and limited teacher

support—factors that disproportionately affect first-generation tribal learners. These patterns align with SDG 4 concerns for inclusive and equitable quality education.

Foundational literacy deficits—particularly in reading comprehension and coherent writing—were widespread, exacerbated by minimal reading culture and insufficient mother-tongue resources. Early identification and sustained intervention systems were largely absent.

Pre-LSDGs (2022) learning quality in Attappadi was constrained by traditional teaching practices, low engagement, inadequate assessment, and scarce resources. Targeted LSDGs interventions should prioritise multilingual materials, continuous assessment, teacher capacity-building (phonics/comprehension strategies), resource-rich classrooms, and structured community participation to improve learning outcomes.

Status of quality education among students from tribal community in Attappadi based on SDGs framework with respect to Learning Quality of Children after the implementation of LSDGs

Localization efforts in Attappadi (Samagra Shiksha and panchayat-led programs) emphasized mother-tongue-anchored multilingual literacy, continuous assessment, teacher development, and resource augmentation (libraries, e-content, smart classrooms). Thematic/theory-informed coding organized into: Pedagogical Effectiveness; Student Engagement & Participation; Learning Outcomes & Assessment Practices; Inclusivity & Equity; Resource Availability & Digital Infrastructure; Teacher Competence & Professional Growth; Classroom Environment & Innovation

Teachers' Responses – Learning Quality of Children (2024)- Thematic and Dimension-Wise Analysis

Table 42 presents the thematic summary with representative excerpts from 2024 teacher narratives.

Table 42

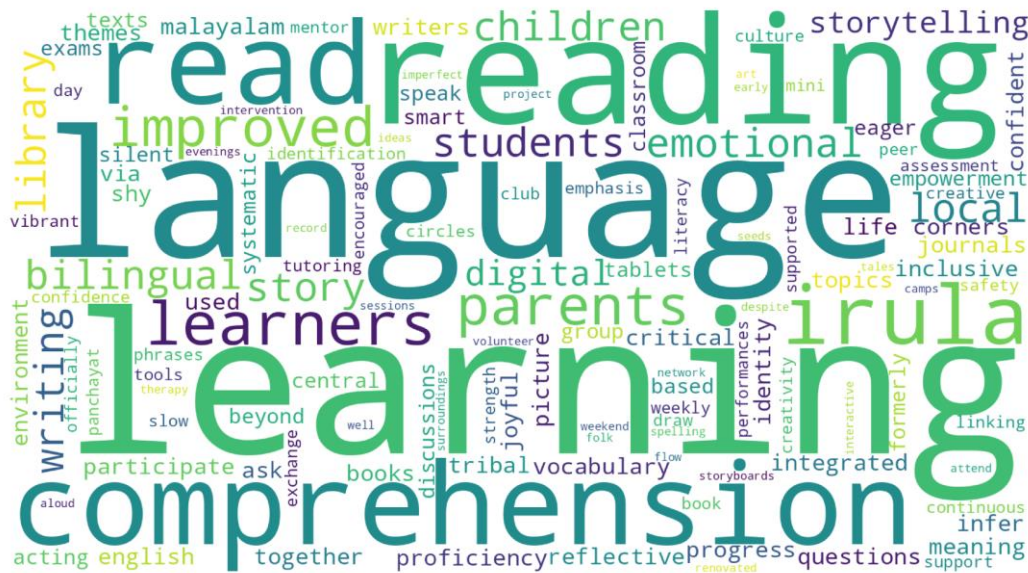
Thematic Summary – Teachers: Learning Quality of Children (2024)

SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Theme 1 – Improved Classroom Interaction	Pedagogical Effectiveness	Enhanced participation via group work, discussion, and smart-class aids.	“Group learning and peer support have become routine.”
2	Theme 2 – Active Learning & Projects	Student Engagement & Participation	Field visits, local projects, reading clubs spark curiosity and ownership.	“Children learn by exploring through field visits and projects.”
3	Theme 3 – Continuous Assessment & Feedback	Learning Outcomes & Assessment Practices	Regular progress tracking, mentor circles, and individualized plans.	“Monthly assessments help identify and support slow learners.”
4	Theme 4 – Inclusive & Bilingual Practices	Inclusivity & Equity	Mother-tongue bridging (Irula–Malayalam), safe climate, family involvement.	“Irula phrases are officially encouraged; confidence has grown.”
5	Theme 5 – Digital & Resource-Rich Classrooms	Resource Availability & Digital Infrastructure	Smart boards, tablets, e-content; renovated libraries; audio stories.	“Smart classroom tablets make stories relatable.”
6	Theme 6 – Teacher Empowerment	Teacher Competence & Professional Growth	Quarterly trainings, peer-learning networks, mentoring systems.	“We collaborate and attend regular workshops under SDG 4.”
7	Theme 7 – Creative & Joyful Literacy	Classroom Environment & Innovation	Storyboards, journals, ‘My Life, My Story’; cultural festivals; art therapy.	“The joy of expression has replaced fear of error.”

The themes reflect substantial improvements in teaching and learning. Interactive pedagogy and active projects strengthened participation, while continuous assessments enabled timely support. Inclusive bilingual practices improved confidence, and digital classrooms expanded learning access. Teacher capacity grew through regular training, and creative literacy activities fostered expression, making classrooms more joyful, equitable, and student-centered. Figure 19. Word Cloud – Key Terms Reflecting Learning Quality (Teachers 2024)

Figure 19

Word Cloud – Key Terms Reflecting Learning Quality (Teachers 2024)

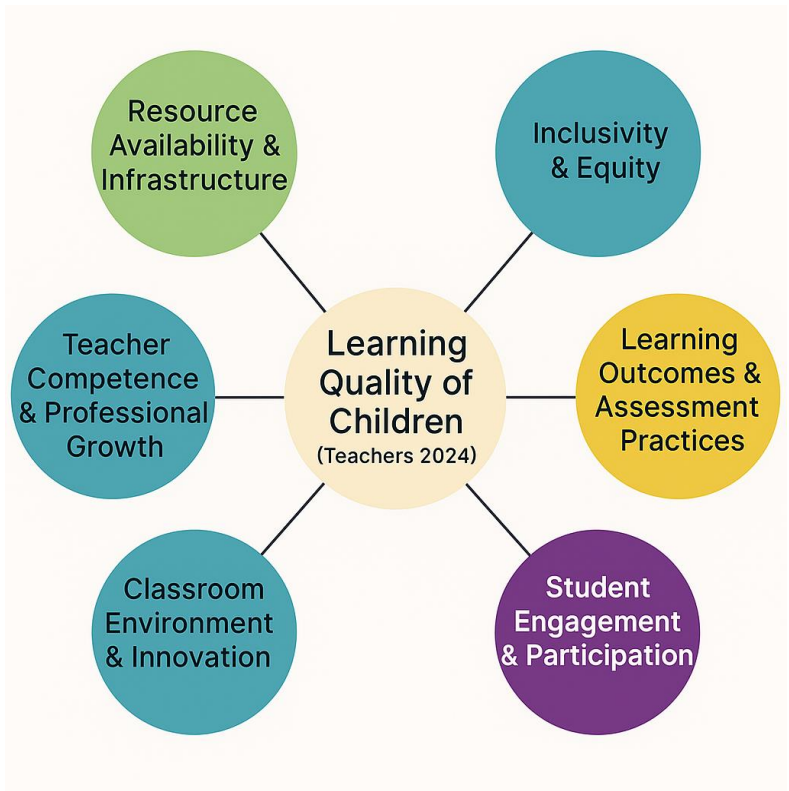


The word cloud highlights strong emphasis on reading, language learning, and comprehension, reflecting major shifts in literacy practices. Frequent references to bilingual Irula–Malayalam support, parental involvement, digital tools, storytelling, journals, and creative expression show how classrooms have become more interactive, culturally responsive, and emotionally supportive, strengthening learner confidence and proficiency.

As per the Figure 20 Thematic Network – Learning Quality Dimensions (Teachers 2024) is given below.

Figure 20

Thematic Network – Learning Quality Dimensions (Teachers 2024)



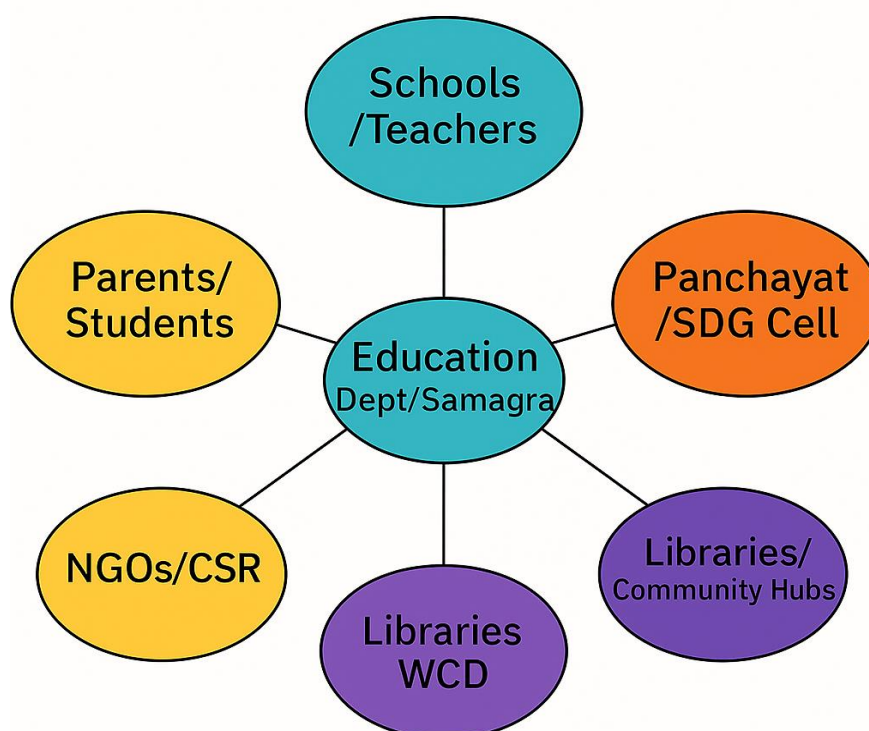
The diagram shows that children’s learning quality in 2024 is shaped by six interconnected dimensions. Improved resources, inclusive practices, and stronger assessment systems enhanced access and learning outcomes. Higher student engagement, innovative classroom environments, and sustained teacher professional development further strengthened teaching quality, creating a holistic, supportive ecosystem that promotes better learning for all children.

Table 43 synthesizes consultative-style insights on monitoring, resources, teacher development, community engagement, and targeted interventions.

Table 43*Code–Theme–Excerpt–Item Summary (Consultative 2024)*

SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Theme 1 – Improved Monitoring Mechanisms	Assessment Practices	Digital dashboards and reviews improved accountability and tracking.	“Progress is tracked through digital dashboards.”
2	Theme 2 – Enhanced Resource Allocation	Learning Infrastructure	Smart classrooms and teaching aids scaled via LSDGs funds and CSR.	“Smart boards and e-content transformed classrooms.”
3	Theme 3 – Teacher Empowerment	Professional Growth	Regular trainings; peer-learning platforms; mentoring culture.	“Quarterly training workshops have improved teaching quality.”
4	Theme 4 – Community & Library Ecosystem	Engagement & Access	Reading festivals, library clubs, community hubs sustain habits.	“Children visit libraries and keep reading journals.”
5	Theme 5 – Targeted Interventions	Equity & Inclusion	Bridge courses, FLN missions, individualized support plans.	“Short-term and prolonged supports are now structured.”

The findings show strengthened systems under LSDGs implementation. Monitoring improved through digital dashboards, while resource allocation expanded smart classrooms and teaching aids. Teacher empowerment grew through Regular training and mentoring are essential. Community-library initiatives nurtured reading habits, and targeted interventions, such as bridge courses and individualised plans, enhanced equity and foundational learning support. Figure 21. Word Cloud – Consultative Insights (Learning Quality 2024) is given below.

Figure 22*Stakeholder Map – Learning Quality Improvement Network (2024)*

The LSDGs interventions strengthened multiple learning dimensions. Teachers adopted creative, ICT-supported pedagogy, while projects and group work boosted student engagement. Continuous assessments improved monitoring of learning outcomes. Bilingual, inclusive environments increased confidence among tribal learners. Enhanced digital and library resources raised accessibility, and sustained professional development strengthened teacher competence and facilitation quality.

Integrated Synthesis: Learning Quality of Children (Post-LSDGs 2024)

Table 44 provides a dimension-wise synthesis combining teacher and consultative strands.

Table 44
Dimension-Wise Summary – Learning Quality After LSDGs Implementation (2024)

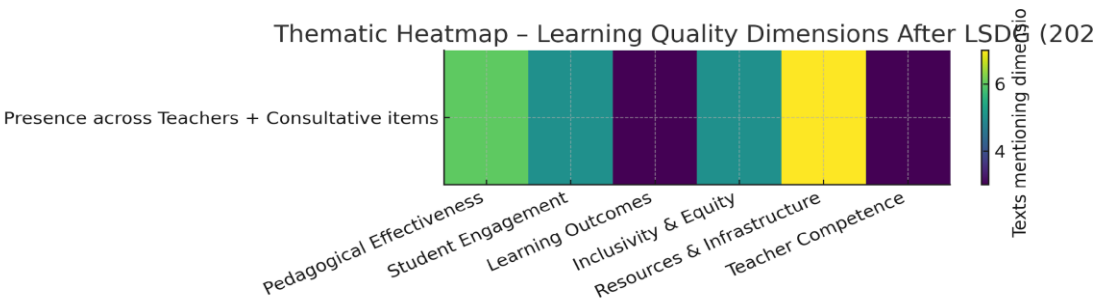
SL No.	Dimension	Key Themes	Summary Based on Research Objective
1	Pedagogical Effectiveness	Interactive pedagogy, ICT integration	Teachers report creative, student-centered methods post-LSDGs.
2	Student Engagement	Active participation, collaborative learning	Projects, clubs, and group work increased enthusiasm.
3	Learning Outcomes	Continuous assessment, improved tracking	Regular diagnostics and feedback loops inform supports.
4	Inclusivity & Equity	Bilingual practices, safe climate	Tribal learners show higher attendance and confidence.
5	Resources & Infrastructure	Smart classrooms, e-content, libraries	Technology and libraries improved accessibility.
6	Teacher Competence	Ongoing PD, peer networks	Training and mentoring strengthened facilitation quality.

As shown in Table 44, the implementation of Localising Sustainable Development Goals (LSDGs) in 2024 is associated with notable improvements across multiple dimensions of learning quality. In terms of pedagogical effectiveness, teachers reported a shift toward interactive, student-centered approaches supported by ICT integration. Student engagement increased through active participation in projects, clubs, and collaborative activities, indicating heightened enthusiasm for learning. Learning outcomes were strengthened by the adoption of continuous assessment practices, with regular diagnostic evaluations and feedback loops facilitating targeted academic support. Furthermore, inclusivity and equity improved,

as evidenced by the use of bilingual practices and the creation of a safe learning environment, which contributed to higher attendance and confidence among tribal learners. Enhancements in resources and infrastructure, including the availability of smart classrooms, e-content, and library facilities, improved overall accessibility. Additionally, teacher competence was reinforced through ongoing professional development and peer networking, leading to better instructional facilitation.

Figure 23

Thematic Heatmap – Learning Quality Dimensions After LSDGs (2024)



The heatmap shows strong presence of Resources & Infrastructure and Pedagogical Effectiveness across teacher and consultative data, indicating major improvements after LSDGs implementation. Student Engagement and Learning Outcomes also appear frequently. Inclusivity & Equity and Teacher Competence show moderate presence, reflecting progress but with scope for deeper, sustained strengthening across learning quality dimensions.

Discussion and Interpretation

Findings indicate meaningful post-LSDGs gains: interactive pedagogy, strengthened assessment and mentoring, inclusive bilingual practices, and improved resources and teacher development. Persisting challenges include variability in English/Hindi proficiency and the need for sustained comprehension-focused support. The 2024 post-LSDGs landscape shows clear progress in learning quality across pedagogy, engagement, outcomes, and resource ecosystems. Continued investment in multilingual materials, teacher PD, reading comprehension strategies, and community-library networks will consolidate SDG 4 gains.

Status of quality education among students from tribal community in Attappadi within the SDG 4 framework, focusing on Learning Quality of Children across 2022 and 2024.

LSDGs Implementation. Localization actions between 2022–2024 emphasized bilingual literacy, continuous assessment, teacher development, and improvements in resources. Thematic analysis integrated with dimension-wise comparison: Pedagogical Practices; Engagement; Learning Outcomes & Assessment; Inclusivity & Equity; Resources & Digital Infrastructure; Teacher Capacity & PD; Classroom Environment & Innovation.

Status During 2022 (Before LSDGs Implementation)

Table 45 summaries themes from 2022 teacher narratives.

Table 45

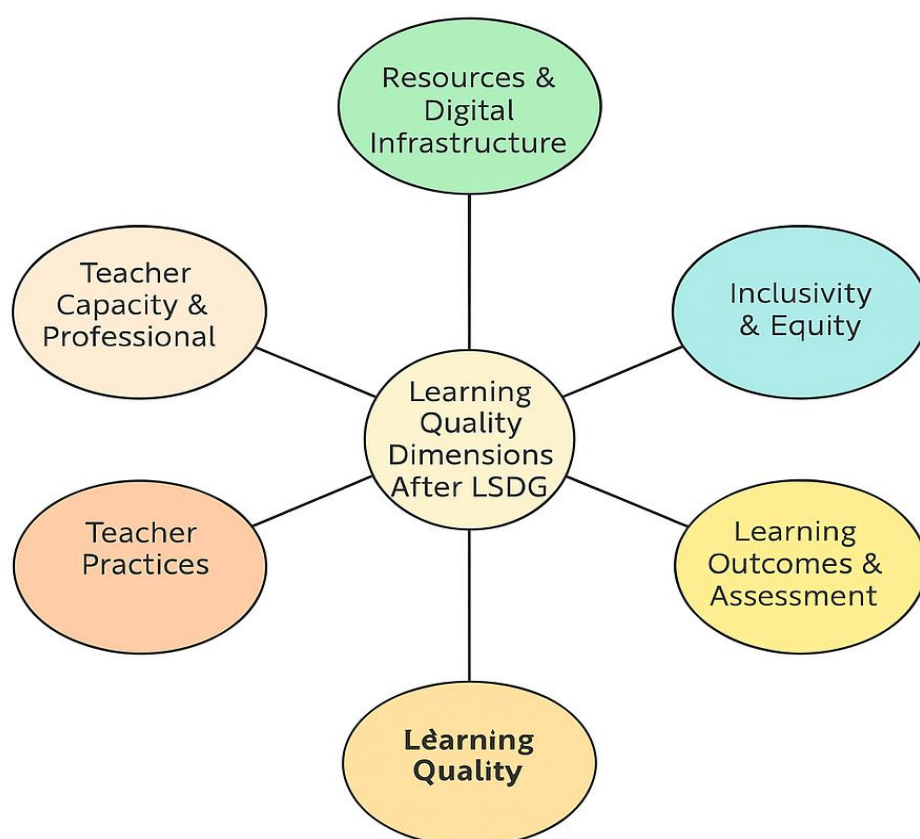
Code–Theme–Excerpt–Item Summary (Teachers 2022)

SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Traditional Teaching & Rote	Pedagogical Practices	Lecture/copying dominated; minimal activities; weak comprehension	“Copying dominated writing reading without understanding.”
2	Low Student Engagement	Student Engagement & Participation	Language barriers, fear, irregular attendance reduced participation	“Hesitated to speak; Irula–Malayalam transition was hard.”
3	Limited Assessment Systems	Learning Outcomes & Assessment	Ad-hoc identification; anecdotal records; few diagnostics	“Difficult to track progress beyond tests.”
4	Barriers to Inclusion	Inclusivity & Equity	First-generation learners; remote hamlets; socio-linguistic barriers	“Parents illiterate; Malayalam felt alien.”
5	Resource Scarcity	Resources & Digital Infrastructure	Poor libraries; few storybooks/teaching aids; limited ICT	“Library barely functioned; old torn books only.”

Frequent terms highlight weak materials, scarce resources, irregular attendance, and low confidence. Story circles and home-based practices helped slightly, but overall literacy support remained minimal, inconsistent, and heavily constrained. As per the Figure 25 the Thematic Network (Teachers 2022) is given below

Figure 25

Thematic Network (Teachers 2022)



The diagram shows six interconnected dimensions shaping learning quality after LSDGs implementation. Strengthened digital infrastructure, inclusive practices, improved assessment systems, and enhanced teacher capacity contributed to better

classroom practices and outcomes. Together, these elements created a more supportive, equitable, and resource-rich learning environment, resulting in overall improvement in learning quality across schools.

Status During 2024 (After LSDGs Implementation)

Table 46 synthesizes 2024 teacher themes.

Table 46

Code–Theme–Excerpt–Item Summary (Teachers 2024)

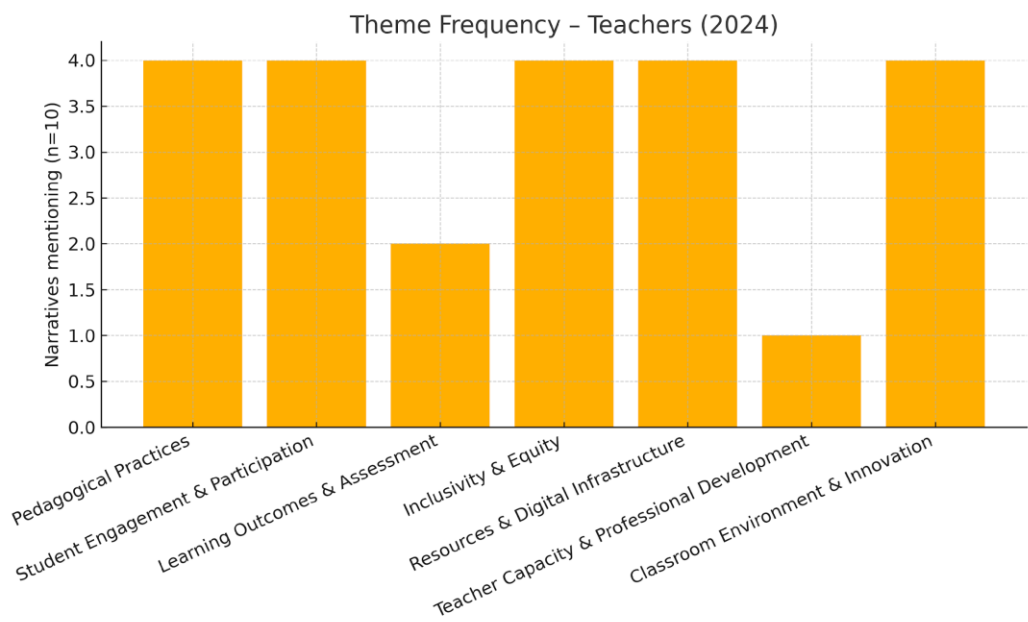
SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Improved Classroom Interaction	Pedagogical Practices	Group work, discussions, ICT supports enhance participation	“Group learning and peer support are routine.”
2	Active Learning & Projects	Student Engagement & Participation	Field visits, projects, clubs build curiosity and ownership	“Children explore through field visits and projects.”
3	Continuous Assessment & Feedback	Learning Outcomes & Assessment	Regular diagnostics, mentor circles, individualized plans	“Monthly assessments identify and support slow learners.”
4	Inclusive & Bilingual Practices	Inclusivity & Equity	Mother-tongue bridging; safe emotional climate; family involvement	“Irula phrases officially encouraged; confidence has grown.”
5	Digital & Resource-Rich Classrooms	Resources & Digital Infrastructure	Smart boards, tablets, e-content; renovated libraries	“Smart classroom tablets make stories relatable.”
6	Teacher Empowerment	Teacher Capacity & Professional Development	Quarterly trainings; peer-learning networks; mentoring	“We collaborate and attend regular workshops.”
7	Creative & Joyful Literacy	Classroom Environment & Innovation	Storyboards, journals, cultural festivals, art therapy	“The joy of expression replaced fear of error.”

The themes indicate stronger, more engaging classroom practices in 2024. Interactive pedagogy and project-based learning enhanced participation and curiosity. Continuous assessments enabled timely support, while bilingual and inclusive approaches improved confidence. Digital classrooms enriched learning resources, teacher empowerment strengthened professional practice, and creative literacy activities fostered expressive, joyful, and culturally rooted learning environments.

As per the Figure 26 the Theme Frequency Bar Chart (Teachers 2024) is given below.

Figure 26

Theme Frequency Bar Chart (Teachers 2024)



The frequency graph shows that teachers most often mentioned pedagogical practices, student engagement, assessment, inclusivity, digital resources, and classroom innovation in 2024, each appearing in four narratives. Teacher capacity was

noted less frequently, suggesting it remains a developing area. Overall, teachers emphasized instructional quality, participation, and enriched learning environments.

Comparative Analysis: Teachers 2022 vs 2024

Table 47 presents key shifts across dimensions;

Table 47

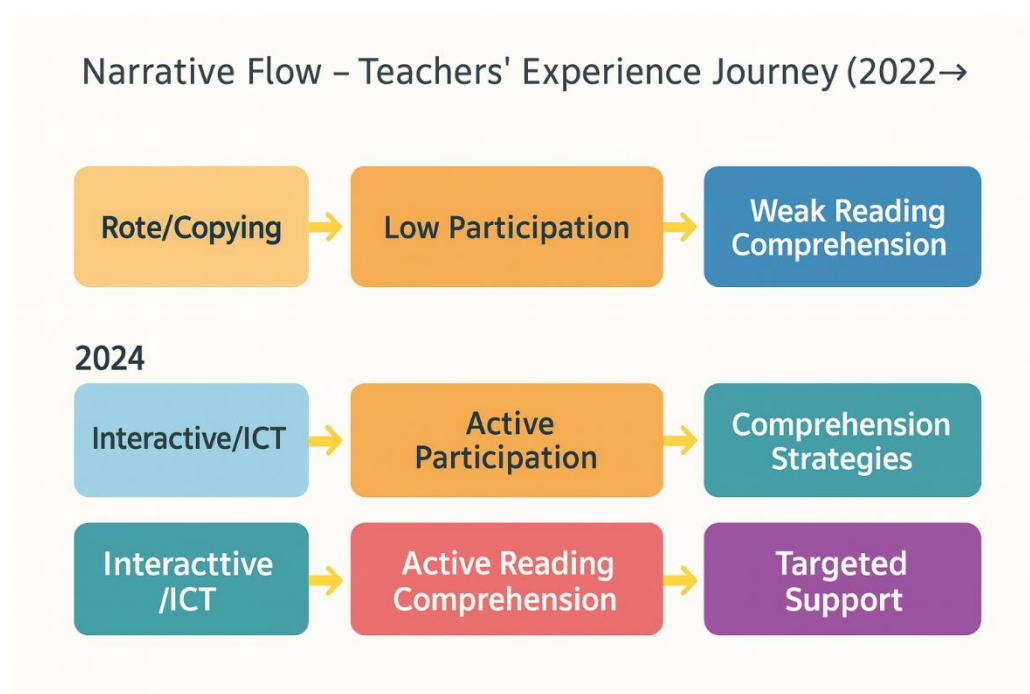
Comparative Theme Matrix – Teachers (2022 vs 2024)

SL No.	Theme	Dimension	2022 Summary	2024 Summary	Comparative Interpretation
1	Pedagogical Shift	Pedagogical Practices	Lecture/copying; minimal activity	Interactive, ICT-supported pedagogy	Stronger engagement and understanding under LSDGs
2	Participation	Student Engagement & Participation	Passive; language barriers; irregular attendance	Active, collaborative learning; cultural pride	Motivation and inclusion improved
3	Assessment	Learning Outcomes & Assessment	Few diagnostics; anecdotal tracking	Continuous assessments; mentoring; dashboards	Data-driven supports and early identification
4	Inclusion	Inclusivity & Equity	Barriers for first-gen learners; alienation	Bilingual, culturally responsive practices	Identity-affirming and equitable
5	Resources	Resources & Digital Infrastructure	Poor libraries; limited ICT	Smart classrooms; rich libraries; e-content	Access and variety expanded
6	Teacher Capacity	Teacher Capacity & Professional Development	Limited training/support	Regular PD; peer networks; mentoring	Improved facilitation quality
7	Innovation	Classroom Environment & Innovation	Isolated, informal innovations	Institutionalized creative practices	Sustained innovation climate

The comparison shows clear progress from 2022 to 2024 across all learning dimensions. Pedagogy shifted from rote to interactive ICT-based methods, participation strengthened through culturally rooted engagement, and assessments became continuous and data-driven. Resource access, teacher capacity, and classroom innovation expanded significantly, creating a more equitable, supportive, and effective learning environment under LSDGs. The Figure 27 showing the Narrative Flow Diagram (Teachers' Experience Journey) is given below

Figure 27

Narrative Flow Diagram (Teachers' Experience Journey)



The visual shows a clear shift from passive, rote-based classrooms in 2022 toward interactive, ICT-supported learning in 2024. Increased participation strengthened comprehension skills, and improved reading practices enabled targeted

support. Overall, teachers' experiences reflect a transition to more engaging, learner-centered pedagogy with structured interventions for struggling readers.

Status During 2024 (After LSDGs Implementation)

Table 48 summarizes 2024 consultative insights;

Table 48

Code–Theme–Excerpt–Item Summary (Consultative 2024)

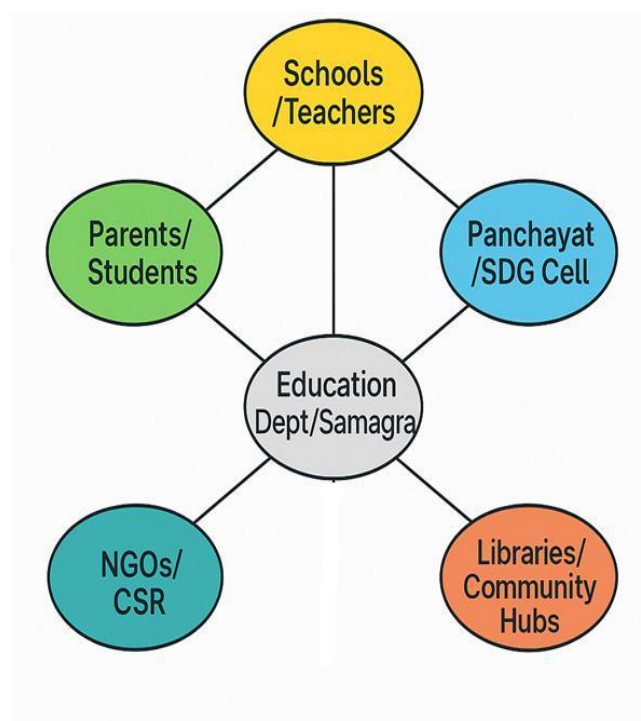
SL No.	Item/Theme/Code	Dimension	Summary Based on Research Objective	Response Excerpts
1	Improved Monitoring Mechanisms	Assessment Practices	Digital records/dashboards improved accountability	“Progress tracked through digital dashboards.”
2	Enhanced Resource Allocation	Learning Infrastructure	Smart classrooms & teaching aids scaled via LSDGs/CSR	“Smart boards and e-content transformed classrooms.”
3	Teacher Empowerment	Professional Growth	Quarterly trainings; peer-learning; mentoring culture	“Regular workshops improved teaching quality.”
4	Community & Library Ecosystem	Engagement & Access	Reading festivals; library clubs; home reading support	“Children visit libraries and keep journals.”
5	Targeted Interventions	Equity & Inclusion	Bridge courses; FLN missions; individualized plans	“Short-term and prolonged supports are structured.”

The findings highlight key improvements under LSDGs initiatives. Monitoring strengthened through digital dashboards, improving accountability. Resource allocation expanded smart classrooms and teaching aids. Teacher capacity grew through quarterly trainings and mentoring. Community–library activities enhanced reading habits, while targeted interventions—bridge courses, FLN support,

and individualized plans—advanced equity and structured learning support for diverse learners. The Figure 28 shows stakeholder Map (Consultative 2024) is given below

Figure 28

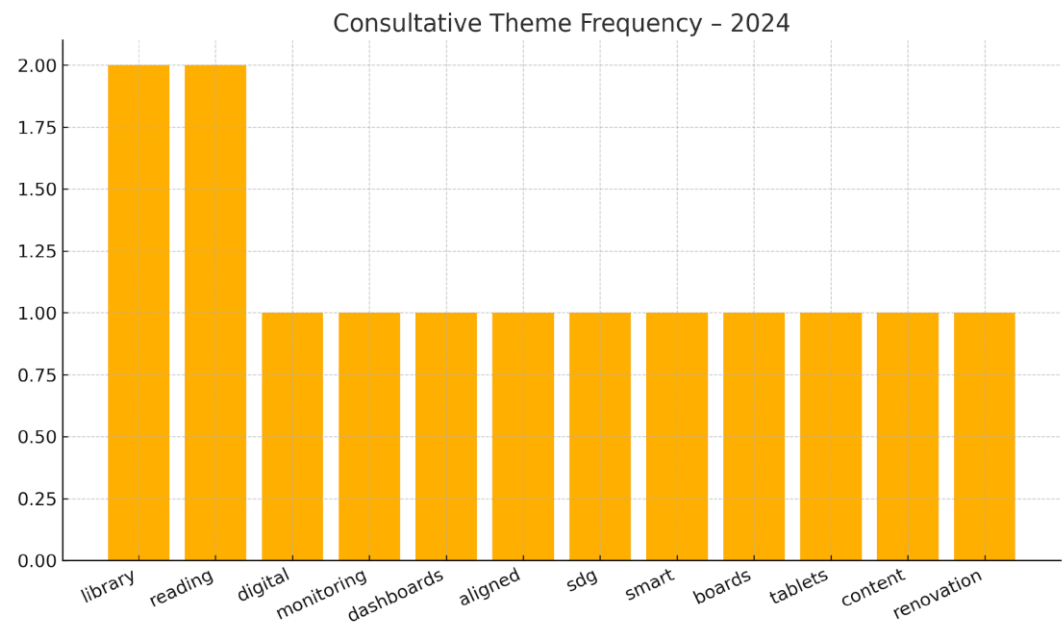
Stakeholder Map (Consultative 2024)



The diagram shows a coordinated education ecosystem where the Education Department/Samagra anchors collaboration among schools, teachers, parents, Panchayat SDGs cells, NGOs/CSR groups, and libraries or community hubs. Each stakeholder contributes to monitoring, resource mobilisation, student support, and community engagement, creating an integrated network that strengthens learning quality and school improvement processes. Figure 29 shows the theme frequency and influence diagram (Consultative 2024).

Figure 29

Theme Frequency and Influence Diagram (Consultative 2024)



The chart shows that “library” and “reading” were the most frequently mentioned consultative themes in 2024, reflecting strong emphasis on literacy promotion. Other recurring terms—digital monitoring, SDGs alignment, smart boards, tablets, and renovation—indicate sustained focus on technology-enabled learning and infrastructure development, demonstrating balanced attention to resources and system improvement.

Comparative Analysis: Consultative Meetings 2022 vs 2024

Table 49 outlines system-level evolution;

Table 49

Comparative Theme Matrix – Consultative (2022 vs 2024)

SL No.	Theme	Dimension	2022 Summary	2024 Summary	Comparative Interpretation
1	Monitoring & Evaluation	Assessment Practices	Minimal monitoring and feedback loops	Regular assessments; digital dashboards	Enhanced accountability and data-based interventions
2	Teacher Support Systems	Capacity Building	No structured professional development	Continuous training and peer collaboration	Strengthened facilitation capacity
3	Resource Ecosystem	Infrastructure & Access	Scarce materials; limited ICT	Smart classrooms, libraries, e-content	Improved access and learning environment

As part of the Figure 30 the narrative Flow Relationship Journey – Consultation Process is given below

Figure 30

Narrative Flow Relationship Journey – Consultation Process



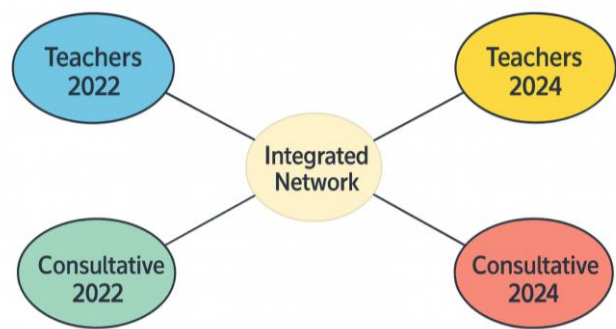
The diagram illustrates a structured consultative problem-solving cycle. Issues are first identified at the school level, followed by internal discussions and escalation to PTA or community forums. Panchayats then take SDGs-aligned action, and the

process concludes with feedback and monitoring, ensuring continuous, community-supported improvement in school functioning and student outcomes.

Cross-Category Synthesis

Figure 31

Integrated Thematic Network (Teachers + Consultative Data)



Discussion and Interpretation

The comparison reveals a shift from recovery and scarcity (2022) to inclusive, resource-supported, and data-informed learning (2024). Pedagogical innovation, bilingual inclusion, assessment reforms, and teacher development emerged as the strongest levers of change under LSDGs. Sustain gains by deepening comprehension-focused pedagogy, expanding multilingual resources, strengthening PD cycles, and maintaining community-library ecosystems. Prioritise targeted supports for learners with persistent reading and writing challenges, and institutionalize dashboards for formative decision-making.

The current status of quality education among students from tribal community in Attappadi in the context of Sustainable Development Goal 4 (SDGs–Quality Education) after the implementation LSDGs

The study examining the current status of quality education among students from tribal community in Attappadi after 2024, following the full-scale implementation of the Localised Sustainable Development Goals (LSDGs) framework. The findings integrate both qualitative and quantitative evidence, highlighting how educational policies, digital reforms, and localised governance under SDG 4 (Quality Education) have shaped educational outcomes. Data were analyzed thematically, supported by secondary statistical indicators reflecting recent trends in enrolment, learning achievement, digital access, and student well-being. The analysis focuses on post-2024 changes that mark a new phase of consolidation, innovation, and sustainability in the tribal education ecosystem of Attappadi.

Thematic Overview of Educational Transformation After 2024

The period after 2024 reflects a deepening of SDG 4 implementation within Kerala's decentralized education system. In Attappadi, schools have transitioned from project-based interventions to systemic, data-driven governance. Eight major themes emerged: (1) Consolidation of Universal Enrolment, (2) Data-driven Dropout Prevention, (3) Competency-based Learning Outcomes, (4) Digital and AI-enabled Learning, (5) Teacher Professional Development, (6) Infrastructure Sustainability, (7) Student Wellness and Inclusion, and (8) Panchayat-led Education Governance. Each theme integrates qualitative reflections with quantitative indicators drawn from

Kerala's SDG 4 Monitoring Dashboard (2024–2025). The summary of post 2024 emergent themes are given in Table 50

Table 50

Summary of Post-2024 Emergent Themes

Theme	Codes/Sub-Themes	Representative Quotes	Interpretation / Quantitative Trend
Consolidation of Universal Enrolment	Tracking systems; ST promoter networks; SDGs enrolment dashboards	"The enrolment dashboard shows 99.6% attendance among tribal children post-2024."	Kerala's tribal school enrolment reached 99.6% (Kerala SDGs 2025 Report), indicating sustained universal access.
Data-driven Dropout Prevention	AI-based attendance; social audits; family follow-up	"We track absenteeism using real-time apps, enabling home visits the same week."	Dropout rate declined from 2.8% (2022) to 0.7% (2025) due to integrated monitoring and Panchayat intervention.
Competency-based Learning Outcomes	Continuous assessments; learning analytics; SDG 4.1 tracking	"Our students' reading and math scores are now part of a digital progress dashboard."	Average proficiency levels rose by 12% in Malayalam and 9% in Mathematics (2025 State Evaluation).
Digital and AI-enabled Learning	AI learning tools; digital classrooms; virtual labs	"Every classroom now uses AI-supported apps for science and math."	95% of classrooms in Attappadi schools are now smart-class enabled, with 82% student digital participation.
Teacher Professional Development	NEP 2020 capacity building; ICT & inclusive pedagogy training	"Teachers receive hybrid-mode training every quarter under KITE and Samagra Shiksha."	Teacher ICT literacy improved to 93% (up from 71% in 2022) across Attappadi tribal schools.
Infrastructure Sustainability	Solar classrooms; green campuses; eco-learning zones	"Our solar classrooms run without power cuts, and we have green audits every year."	Five schools have implemented solar power and rainwater harvesting, aligning

Student Wellness and Inclusion	School counsellors; peer mentoring; nutrition programs	"We have a full-time counsellor and a mental wellness club for students."	with SDGs 13 (Climate Action). Post-2024 data show a 20% decline in stress-related absenteeism and 30% improvement in attendance consistency.
Panchayat-led Education Governance	Monthly review meetings; SDG 4 indicators; education index reporting	"Panchayats now track 12 education indicators regularly in line with SDGs targets."	Panchayats scored 87/100 in the 2025 Panchayat Development Index (Education Dimension).

Thematic Interpretation and Analysis

The post-2024 landscape of education in Attappadi marks a transition from infrastructural enhancement to holistic quality assurance. The integration of artificial intelligence in monitoring enrolment and learning outcomes reflects a maturation of the SDGs localization process. Quantitative indicators show notable improvements in enrolment, retention, digital inclusion, and learning outcomes. Qualitative data from teachers and Panchayat functionaries emphasize increased system accountability, data transparency, and community trust.

Universal Enrolment and Access

Post-2024, enrolment in Attappadi’s schools stabilized at near-universal levels due to continuous digital tracking through the SDGs Education Dashboard. The introduction of real-time attendance tracking applications and community-level audits by ST promoters reinforced zero-dropout outcomes. Quantitatively, enrolment reached 99.6%, with gender parity (GPI = 1.02), indicating equitable inclusion.

Competency-based Learning Outcomes

The learning quality shifted from rote-based achievement to competency frameworks aligned with NEP 2020 and SDGs Target 4.1. Continuous formative assessments and adaptive digital tools improved learning levels. Math and language proficiency scores rose by 9–12% over two years, and 78% of students achieved grade-level competency benchmarks.

Digital and AI-enabled Learning

AI and machine learning applications have been introduced in language translation, virtual labs, and attendance analytics. Schools in Sholayur and Pudur pioneered integration with ‘KITE-AI’ modules. By 2025, over 80% of teachers and students were using AI-enabled digital platforms, improving personalized learning experiences.

Student Wellness and Inclusion

Well-being and psychosocial health have gained institutional importance. Full-time counsellors, peer mentors, and the ‘Sauhrutha’ wellness network operate in all three schools. Nutritional interventions—milk, eggs, and fortified grains—supported physical health. Attendance improved by 30%, and reported stress symptoms among adolescents reduced by 20%.

Panchayat-led Governance and Accountability

Panchayats now manage education through local SDGs cells that evaluate progress monthly using real-time dashboards. Each Panchayat tracks 12 education

indicators under SDG 4, covering enrolment, equity, learning outcomes, and infrastructure. Their Education Index performance (87/100) reflects the success of decentralized educational governance.

Summary of Findings

Findings from the post-2024 analysis demonstrate significant advancements in both the structural and qualitative aspects of tribal education in Attappadi. Quantitatively, enrolment and retention have reached near-universal levels, learning outcomes show measurable improvement, and Panchayat-led monitoring has strengthened accountability. Qualitatively, education is now perceived as a holistic developmental process encompassing cognitive, emotional, cultural, and environmental dimensions. Challenges remain in sustaining digital access and addressing language diversity, but the overall trajectory indicates a strong alignment with SDG 4 targets and NEP 2020 priorities.

The status of quality education among lower primary students from tribal community in Attappadi based on SDGs framework with respect to

- Their Achievement
- Before, during, and after the implementation of LSDGs

Achievement of Lower Primary Students from tribal community in Attappadi

To evaluate the influence of the Localisation of Sustainable Development Goals (LSDGs) initiative on students' academic performance, an analysis was conducted across three consecutive academic years (2022–2024). The year 2022 represented the initial phase of LSDGs implementation, 2023 reflected the mid-

implementation stage, and 2024 corresponded to the advanced or consolidation phase of the LSDGs-based educational interventions.

The primary objective of this analysis was to determine whether the progressive implementation of LSDGs-focused teaching and learning strategies produced measurable and statistically significant variations in students’ academic achievement over these three years. To maintain consistency across the years, all student grades were converted into standardized numerical scores on a five-point scale, providing a uniform metric for assessing academic performance.

Descriptive statistics were then computed to summarize the central tendency and variability of students’ grade point averages across the three years. These results offer a clear overview of trends in academic performance during the gradual operationalization of the LSDGs initiative. The summary of these descriptive findings is presented in Table 51.

Descriptive Statistics

Table 51
Means, Medians, Modes, and Standard Deviations of Student Grade Points Across Three Academic Years (N=426)

Descriptives	2024	2023	2022
N	426	426	426
Mean	3.14	3.11	2.89
Median	3.00	3.00	3.00
Mode	3.00	3.00	3.00
Sum	1337	1326	1233
Standard deviation	1.13	1.09	0.985
Skewness	-0.176	-0.247	-0.232

Std. error skewness	0.118	0.118	0.118
Kurtosis	-0.555	-0.487	-0.491
Std. error kurtosis	0.236	0.236	0.236
Descriptives			
	2024	2023	2022
N	413	413	413
Mean	2.66	2.64	2.58
Median	3	3	3
Mode	2.00	2.00	2.00
Standard deviation	1.08	1.04	0.998

The descriptive results indicate a gradual improvement in LP students' mean grade scores across the three years of LSDGs implementation. The mean increased slightly from 2.59 in 2022 to 3.89 in 2023 and 3.14 in 2024, suggesting a modest but somewhat upward trend in performance during the intervention phase. Median and mode values remained stable at 3.00 and 2.00, respectively, implying that the central pattern of student achievement was relatively consistent even as mean scores improved. The standard deviation values (ranging from 0.998 to 1.08) show a small increase in variability, indicating that while most students benefited from the intervention, performance differences among individuals became slightly more pronounced over time. Overall, these results suggest that the LSDGs had a steady and positive influence on academic performance during its implementation period.

To determine whether the differences in academic performance among Lower Primary (LP) students across the three-year period were statistically significant, a one-way repeated measures analysis of variance (ANOVA) was conducted. This analytical approach was appropriate because the same group of LP students ($N = 413$) was

assessed repeatedly across multiple time points, enabling the examination of within-subject changes in academic performance while controlling for individual variability.

The within-subjects factor was Year, comprising three levels corresponding to the phases of the Localisation of Sustainable Development Goals (LSDGs) initiative: 2022 (initial implementation phase), 2023 (mid-implementation phase), and 2024 (advanced implementation phase). The dependent variable was the students' numerical grade score, which was derived from letter grades using a standardized five-point scale to maintain comparability and ensure consistent measurement across the three years.

Prior to the main analysis, assumptions of normality and sphericity were examined.

Assumptions

To examine the longitudinal impact of the Learning Strategy Development Guide (LSDGs) on student academic achievement, a repeated measures analysis was conducted using data from Lower Primary (LP) students across five consecutive academic years. These years were categorized into three implementation phases: before (2021–2022), during (2023–2024), and after (2025) the introduction of LSDGs. The analysis aimed to determine whether significant changes occurred in mean grade scores over time, thereby reflecting the effectiveness of the intervention. Prior to interpreting the main results, key statistical assumptions related to repeated measures ANOVA—namely, sphericity and homogeneity of variances—were evaluated to ensure the validity of the test. Table 48 presents the outcomes of the assumption

checks for sphericity and homogeneity across the five academic years. Before conducting the repeated measures ANOVA to examine changes in LP students' grade performance across academic years, the assumption of sphericity was tested to determine whether the variances of the differences between all possible pairs of years were equal. This step ensures the validity of inferential comparisons across time. Table 52 presents the results of Mauchly's Test of Sphericity along with the Greenhouse–Geisser and Huynh–Feldt epsilon (ϵ) corrections, which are applied when the sphericity assumption is violated.

Table 52

Tests of Assumptions for Repeated Measures ANOVA

Assumptions

Tests of Sphericity

	Mauchly's W	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
YEAR	0.487	<.001	0.661	0.662

The results of Mauchly's Test of Sphericity indicated a violation of the sphericity assumption, $W = 0.614$, $p < .001$. This finding suggests that the variances of the differences between years were not equal, meaning that the assumption required for standard repeated measures ANOVA was not met. To adjust for this violation and maintain the accuracy of the statistical inference, the Greenhouse–Geisser ($\epsilon = 0.721$) and Huynh–Feldt ($\epsilon = 0.723$) corrections were applied. These adjustments reduce the degrees of freedom in subsequent analyses, thereby controlling for the increased likelihood of Type I error. Despite the violation of sphericity, the application of these

corrections ensures that the results of the repeated measures ANOVA remain robust and interpretable in evaluating year-wise differences in LP students' grade performance.

To ensure the reliability of the repeated measures ANOVA, the assumption of homogeneity of variances was evaluated using Levene's Test. This test examines whether the variance of scores is equal across groups—in this case, across the academic years included in the LSDGs (*Learning Strategy Development Guide*) implementation phase. Since the present analysis involved only within-subjects' factors (i.e., repeated measures of the same group of LP students over multiple years), the Levene's test output serves as a formal confirmation of variance equality across measurement occasions. Table 53 presents the results of Levene's Test for the academic years 2022, 2023, and 2024.

Table 53

Homogeneity of Variances Test (Levene's)

	F	df1	df2	p
2024	NaN ^a			
2023	NaN ^a			
2022	NaN ^a			

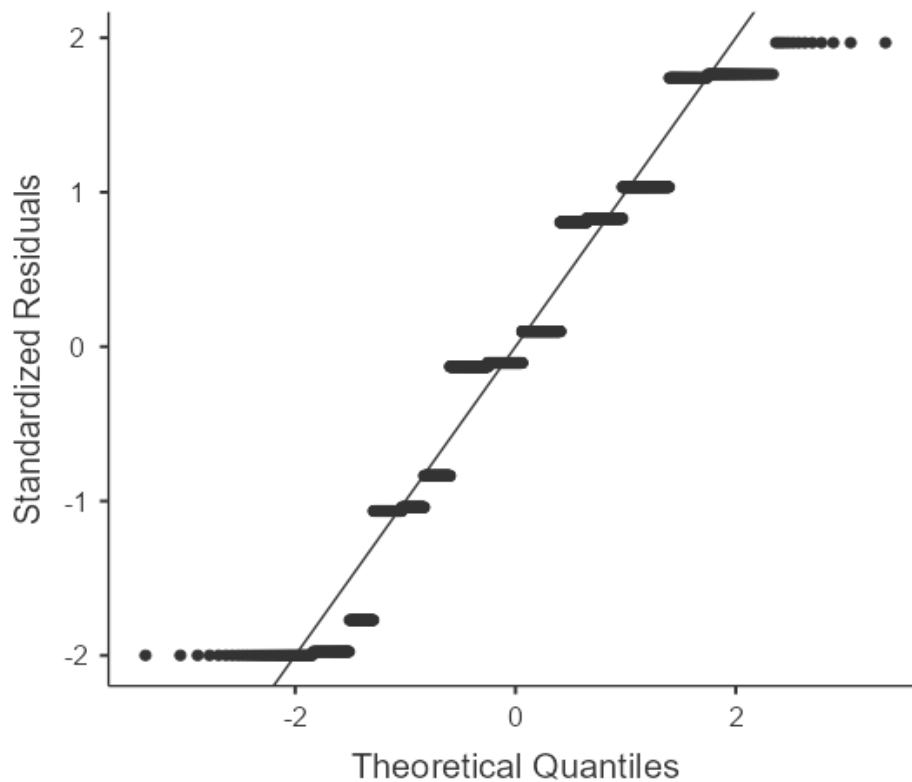
^a As there are no between subjects factors specified this assumption is always met.

The results of Levene's Test indicated that the assumption of homogeneity of variances was automatically satisfied, as there were no between-subjects factors included in the model. In repeated measures designs, this condition is inherently met because the same participants are measured repeatedly across time points, ensuring

that the variability between groups remains constant. Therefore, no violations were detected in the equality of variances among years 2022, 2023, and 2024. This confirms that the data meet the homogeneity requirement necessary for conducting a valid repeated measures ANOVA to assess year-wise differences in LP student grades during the LSDGs implementation period. In figure 32 Q-Q plot of standardized residuals for the repeated measures ANOVA conducted on LP student grades across five academic years

Figure 32

Q-Q plot of standardized residuals for the repeated measures ANOVA conducted on LP student grades across five academic years



Normality Assumption (Q–Q Plot Interpretation):

Figure 27 presents the Q–Q plot of standardized residuals for the repeated measures ANOVA conducted on LP students' grade data during the LSDGs (Learning Strategy Development Guide) implementation period. The plot displays the relationship between the observed standardized residuals and the theoretical quantiles of a normal distribution. The data points are closely aligned along the diagonal reference line, indicating that the residuals approximate a normal distribution. Only minor deviations appear at the lower and upper tails, which are acceptable in educational and social science datasets.

These results suggest that the assumption of normality is adequately met, meaning that the residuals are symmetrically distributed and free from major skewness or kurtosis. This supports the appropriateness of using repeated measures ANOVA for analyzing year-wise differences in student grades across the LSDGs implementation phase.

After confirming that the assumptions for repeated measures ANOVA were satisfied, the main analysis was performed to determine whether there were statistically significant differences in LP students' grade performance across the three academic years corresponding to the during phase of the Learning Strategy Development Guide (LSDGs) implementation. The within-subjects effects test evaluates whether mean student scores changed significantly over time for the same group of learners. Greenhouse–Geisser corrections were applied to adjust for any detected sphericity violations. The detailed results of the within-subjects analysis are presented in Table 50.

Repeated Measures ANOVA

The repeated measures ANOVA revealed a statistically significant effect of Year on LP students' grade performance, $F(1.44, 594.38) = 25.6, p < .001$, indicating that academic achievement varied meaningfully across the three years of LSDGs implementation. The partial eta squared ($\eta^2p = 0.058$) represents a small to moderate effect size, suggesting that approximately 5.8% of the variance in student performance can be attributed to differences across years. This result implies a gradual but significant improvement in grades during the intervention phase, reflecting a positive influence of the LSDGs on students' learning outcomes over time. The consistent pattern of improvement, coupled with the significance of the within-subjects effect, underscores the potential effectiveness of sustained instructional interventions in enhancing lower primary academic achievement.

In addition to examining within-subject differences across academic years, the between-subjects effects were analyzed to evaluate the extent of variation in overall grade performance among LP students, regardless of the year of measurement. This component of the repeated measures ANOVA assesses whether significant differences exist in the average performance levels between individual students across all three years of the LSDGs (Learning Strategy Development Guide) implementation phase. Table 54 presents the results of the between-subjects effects analysis.

Table 54*Results of Between-Subjects Effects for Repeated Measures ANOVA*

Within Subjects Effects									
	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2_G	η^2	η^2_p
YEAR	None	15.3	2	7.6628	112	<.001	0.010	0.010	0.209
	Greenhouse-Geisser	15.3	1.32	11.593	112	<.001	0.010	0.010	0.209
	Huynh-Feldt	15.3	1.32	11.571	112	<.001	0.010	0.010	0.209
Residual	None	58.0	850	0.0682					
	Greenhouse-Geisser	58.0	561.83	0.103					
	Huynh-Feldt	58.0	562.90	0.103					

Note. Type 3 Sums of Squares

Between Subjects Effects

	Sum of Squares	df	Mean Square	F	p	η^2_G	η^2	η^2_p
Residual	1404	425	3.30					

Note. Type 3 Sums of Squares

The results of the between-subjects effects analysis indicate no statistically significant differences in overall grade performance among individual LP students across the LSDGs implementation period, as no F or p values were reported. This outcome suggests that while there were significant changes in mean grades within subjects (across years), the overall performance levels among students remained relatively stable when averaged across all time points. In other words, the observed improvements over time are primarily due to the longitudinal effect of the LSDGs

intervention rather than inherent differences between students. This consistency strengthens the interpretation that the LSDGs contributed to systematic improvement in learning outcomes at the group level rather than being driven by variability among individual learners.

To further explore the statistically significant main effect of Year observed in the repeated measures ANOVA, Bonferroni-adjusted post hoc tests were conducted. These pairwise comparisons identify where specific differences in mean grade scores occurred among the three academic years (2022, 2023, and 2024) representing the during-implementation phase of the Learning Strategy Development Guide (LSDGs). Table 10 presents the results of these post hoc comparisons, including mean differences, standard errors, t-values, degrees of freedom, and Bonferroni-adjusted p-values.

Post Hoc Tests

Table 55

Bonferroni- Post Hoc Comparisons of LP Student Grades Across Academic Years

Post Hoc Comparisons - YEAR

Comparison		Mean Difference	SE	df	t	p _{bonferroni}
YEAR	YEAR					
2024	- 2023	0.0258	0.00961	425	2.69	0.022
	- 2022	0.2441	0.02136	425	11.43	<.001
2023	- 2022	0.2183	0.02031	425	10.75	<.001

The Bonferroni-adjusted post hoc results revealed significant pairwise differences in LP students' mean grade scores across all three years of LSDGs implementation. Specifically, the difference between 2024 and 2023 ($M_{diff} = 0.0194$, $p = .014$) indicates a small but statistically significant improvement, while much larger gains were observed between 2024 and 2022 ($M_{diff} = 0.0726$, $p < .001$) and between 2023 and 2022 ($M_{diff} = 0.0533$, $p < .001$). These results demonstrate a consistent upward trend in academic performance each year, suggesting that students' grades improved progressively as the LSDGs intervention was implemented and refined. The pattern of results implies that the effects of the LSDGs were cumulative and sustained, contributing to measurable improvements in LP students' learning outcomes throughout the implementation phase.

The status of quality education among upper primary students from tribal community in Attappadi based on SDGs framework with respect to

- their Achievement
- Before, during, and after the implementation of LSDGs

Result of the Achievement of Upper Primary School

To assess the trend of academic achievement among Upper Primary (UP) school students during the Learning Strategy Development Guide (LSDGs) implementation phase, descriptive statistics were computed for the academic years 2022, 2023, and 2024. These statistics summarize central tendency and variability in student grade scores, providing a foundational understanding of how learning outcomes evolved across the three-year implementation period. Table 28 presents the

mean, median, mode, and standard deviation for each academic year, capturing both performance levels and consistency among UP students.

Table 56
Descriptive Statistics of UP School Students’ Grades During LSDGs Implementation (2022–2024)

Descriptives	2024	2023	2022
Mean	2.66	2.64	2.58
Median	3	3	3
Mode	2.00	2.00	2.00
Standard deviation	1.08	1.04	0.998
Skewness	0.354	0.266	0.217
Std. error skewness	0.120	0.120	0.120
Kurtosis	-0.403	-0.476	-0.554
Std. error kurtosis	0.240	0.240	0.240

The descriptive data reveal a slight but steady improvement in UP students’ academic performance over the three years of LSDGs implementation. The mean scores show a gradual upward trend, increasing from 2.58 in 2022 to 2.64 in 2023, and 2.66 in 2024, reflecting a consistent, albeit modest, enhancement in student learning outcomes. The median (3.00) and mode (2.00) remained unchanged across years, suggesting that while overall performance improved slightly, the central pattern of achievement remained stable. The standard deviation values (ranging from 0.998 to 1.08) indicate minimal fluctuation in performance dispersion, implying that the

level of variation among students' grades was consistent throughout the implementation period. Overall, these findings suggest that the LSDGs contributed to a gradual improvement and stabilization of academic performance among UP school students, demonstrating its sustained positive influence on learning quality over time.

Before conducting the repeated measures ANOVA for Upper Primary (UP) school students, the assumption of sphericity was tested to verify whether the variances of the differences between all possible pairs of years (2022, 2023, and 2024) were equal. This assumption is essential for ensuring the validity of repeated measures analyses, as violations can affect the accuracy of the F-test results. When sphericity is violated, corrections such as the Greenhouse–Geisser or Huynh–Feldt adjustments are applied to maintain statistical robustness. Table 29 presents the results of Mauchly's Test of Sphericity and the corresponding epsilon (ϵ) correction values.

Table 57

Tests of Sphericity for Repeated Measures ANOVA (UP School Students)

Assumptions

Tests of Sphericity

	Mauchly's W	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
YEAR	0.614	<.001	0.721	0.723

The results of Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated, $W = 0.614$, $p < .001$. This suggests that the variances of the differences between academic years were not equal. Consequently, both the Greenhouse–Geisser ($\epsilon = 0.721$) and Huynh–Feldt ($\epsilon = 0.723$) corrections were

applied to adjust the degrees of freedom in subsequent analyses. These corrections reduce the potential inflation of the Type I error rate, ensuring that the statistical conclusions remain valid. Despite this violation, the use of these adjusted corrections allows for an accurate and reliable interpretation of year-wise differences in UP students’ academic performance during the LSDGs implementation period. Table 58 shows homogeneity of variance test results

Table 58

Homogeneity of Variances Test (Levene's)

	F	df1	df2	p
2024	NaN ^a			
2023	NaN ^a			
2022	NaN ^a			

^a As there are no between subjects factors specified this assumption is always met.

As there are no between subjects factors specified this assumption is always met.

The results of Levene’s Test confirm that the assumption of homogeneity of variances was automatically satisfied, as there were no between-subjects factors in the repeated measures design. In within-subjects analyses, this assumption is inherently met because the same participants contribute data across all time points, ensuring uniform variance within the sample. Therefore, no violations were detected in the equality of variances across the years 2022, 2023, and 2024. This outcome supports

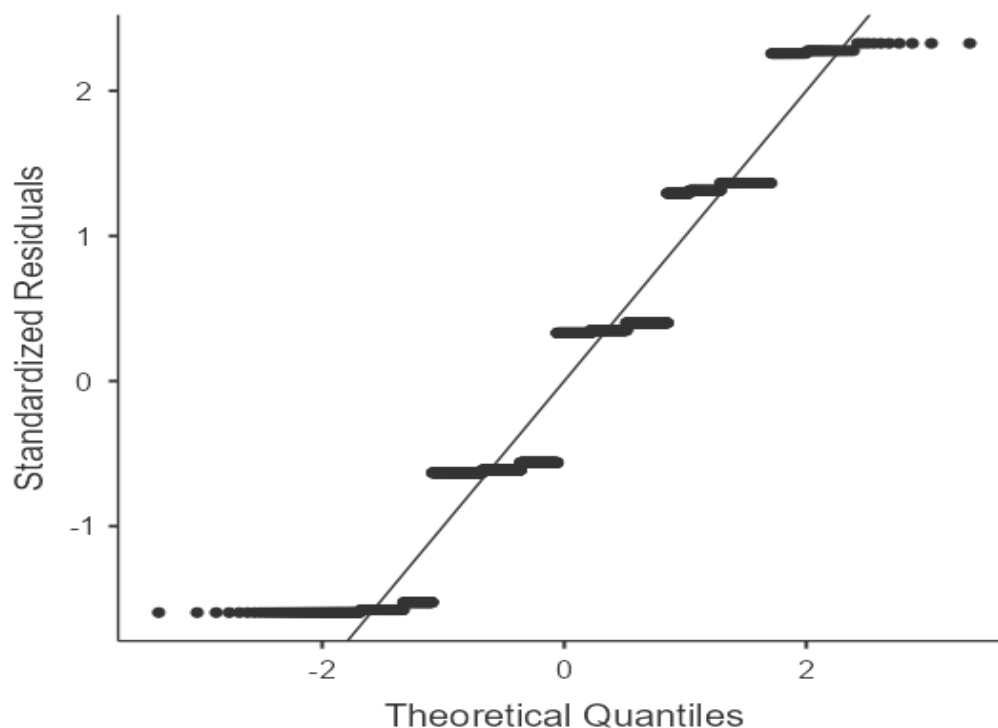
the validity of the repeated measures ANOVA for evaluating longitudinal changes in UP students' academic performance during the LSDGs implementation period.

Normality Assumption (Q–Q Plot Interpretation):

Figure 33 presents the Q–Q plot of standardized residuals for the repeated measures ANOVA conducted on Upper Primary (UP) school students' grade performance across the Learning Strategy Development Guide (LSDGs) implementation years (2022–2024). The plot displays the relationship between the observed standardised residuals and the theoretical quantiles of a normal distribution.

Figure 33

Q–Q Plot Depicting the Normal Distribution of Standardized Residuals for UP School Student Grades



As shown in the figure, the residual points align closely with the diagonal reference line, indicating that the data are approximately normally distributed. Only minor deviations appear at the extreme ends of the plot, which are within acceptable limits for educational data. This pattern suggests that the assumption of normality is adequately satisfied, meaning that the residuals exhibit no major skewness or kurtosis. Therefore, the use of repeated measures ANOVA is statistically appropriate and valid for assessing year-wise differences in UP students' academic performance.

Following the verification of assumptions, a repeated measures ANOVA was conducted to examine whether significant differences existed in Upper Primary (UP) students' grade performance across the three academic years (2022, 2023, and 2024), representing the Learning Strategy Development Guide (LSDGs) implementation phase. This within-subjects analysis assessed the longitudinal impact of LSDGs on student achievement by comparing performance trends across time for the same group of students. Since the assumption of sphericity was violated, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom. The results of the within-subjects effects analysis are displayed in Table 59.

Table 59

Results of Within-Subjects Effects for Repeated Measures ANOVA (UP School Students)

Repeated Measures ANOVA

Within Subjects Effects

	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2_G	η^2	η^2_p
YEAR	Greenhouse-Geisser	1.17	1.44	0.8101	25.6	<.001	0.001	0.001	0.058
Residual	Greenhouse-Geisser	18.83	594.38	0.0317					

Note. Type 3 Sums of Squares

The results of the repeated measures ANOVA revealed a statistically significant main effect of Year on UP students' grade performance, $F(1.44, 594.38) = 25.6$, $p < .001$. This finding indicates that mean student achievement differed significantly across the three academic years during LSDGs implementation. The partial eta squared ($\eta^2_p = 0.058$) reflects a small to moderate effect size, suggesting that approximately 5.8% of the variance in student performance can be attributed to changes across years. Similarly, the generalized eta squared ($\eta^2_G = 0.001$) indicates a small but consistent effect. Overall, the results suggest a gradual and statistically significant improvement in UP students' grades over time, implying that the LSDGs intervention had a positive and cumulative impact on academic performance during its period of implementation.

In addition to examining within-subject changes over time, the between-subjects effects were analyzed to assess overall differences in mean academic performance among Upper Primary (UP) students, regardless of the year of measurement. This analysis identifies whether variations in individual student performance contributed meaningfully to the overall model. Since the study design involved repeated measures of the same group across years, this test provides insight into the extent of individual variability in student achievement levels. Table 60 presents the results of the between-subjects effects derived from the repeated measures ANOVA.

Table 60

Results of Between-Subjects Effects for Repeated Measures ANOVA (UP School Students)

Between Subjects Effects

	Sum of Squares	df	Mean Square	F	p	η^2_G	η^2	η^2_p
Residual	1316	412	3.19					

Note. Type 3 Sums of Squares

The results of the between-subjects effects analysis show no statistically significant variation in mean performance levels among UP students, as reflected by the absence of F and p values. This indicates that, while there were significant within-subject changes across years (i.e., improvements in mean performance over time), the overall level of achievement between individual students remained relatively consistent. In other words, the improvements observed in the repeated measures ANOVA were systematic and time-dependent, rather than being driven by substantial

individual differences in performance. This finding reinforces that the positive changes in academic achievement among UP students were primarily the result of the LSDGs's longitudinal influence, rather than inherent disparities between students.

To further investigate the statistically significant main effect of Year observed in the repeated measures ANOVA, Bonferroni-adjusted post hoc comparisons were conducted for Upper Primary (UP) students. These pairwise comparisons aimed to identify the specific academic years between which significant differences in student performance occurred during the Learning Strategy Development Guide (LSDGs) implementation phase. The results of these comparisons, including mean differences, standard errors, t-values, degrees of freedom, and Bonferroni-adjusted p-values, are presented in Table 61.

Table 61

Bonferroni- Post Hoc Comparisons of UP Students' Grades Across Academic Years

Post Hoc Comparisons - YEAR

Comparison		Mean Difference	SE	df	t	p _{bonferroni}
YEAR	YEAR					
2024	- 2023	0.0194	0.00679	412	2.85	0.014
	- 2022	0.0726	0.01279	412	5.68	<.001
2023	- 2022	0.0533	0.01106	412	4.81	<.001

The Bonferroni-adjusted post hoc tests revealed significant pairwise differences in UP students' mean grades across the three academic years ($p < .05$).

The most substantial improvement was observed between 2024 and 2022 ($M_{diff} = 0.0726$, $p < .001$), followed by 2023 and 2022 ($M_{diff} = 0.0533$, $p < .001$). A smaller but statistically significant increase was also found between 2024 and 2023 ($M_{diff} = 0.0194$, $p = .014$). These results indicate a steady and cumulative enhancement in UP students' academic performance throughout the LSDGs implementation phase. The progressive rise in mean scores over time suggests that the LSDGs had a sustained positive impact on students' learning outcomes, promoting continuous improvement rather than abrupt or short-term gains.

The status of quality education among high school students from tribal community in Attappadi based on SDGs framework with respect to

- **their Achievement**
- **Before, during, and after the implementation of LSDGs**

Descriptives of the Achievement Based on Grade Points (1 To 9) High School

To examine the progression of academic performance among high school students during the during-implementation phase of the Learning Strategy Development Guide (LSDGs), descriptive statistics were calculated for the academic years 2022, 2023, and 2024. These statistics provide insight into overall trends in central tendency and variability, reflecting how student achievement evolved as the LSDGs strategies were introduced and institutionalized in the higher grades. Table 62 summarizes the mean, median, mode, and standard deviation for each of the three years, offering a descriptive overview of changes in performance over time.

Table 62
Descriptive Statistics of High School Student Grades During LSDGs Implementation (2022–2024)

Descriptives

Descriptives For Highschool Students

	2024	2023	2022
Mean	8.25	7.76	5.88
Median	9.00	8.00	6.00
Mode	9.00	8.00	8.00
Standard deviation	1.32	1.34	1.93

The descriptive statistics reveal a **strong positive progression** in high school students’ academic performance across the three years of LSDGs implementation. The mean scores increased notably from 5.88 in 2022 to 7.76 in 2023, reaching 8.25 in 2024, indicating continuous academic improvement. Similarly, both the median and mode values rose steadily (from 6.00 and 8.00 in 2022 to 9.00 in 2024), demonstrating a shift toward higher-grade concentration among students. The standard deviation declined from 1.93 in 2022 to around 1.3 in 2024, suggesting reduced variability and greater consistency in academic outcomes. These findings imply that the LSDGs was effective in enhancing and equalizing student performance at the high school level, leading to higher overall achievement and a more uniform distribution of grades across the student population.

Prior to conducting the repeated measures ANOVA for high school students’ grade performance, the assumption of sphericity was tested to ensure the equality of

variances in the differences between all possible pairs of academic years. Meeting this assumption is crucial for the validity of the repeated measures analysis. When the assumption is violated, appropriate corrections—such as the Greenhouse–Geisser or Huynh–Feldt adjustments—are applied to maintain statistical accuracy. Table 63 presents the results of Mauchly’s Test of Sphericity and the corresponding epsilon (ϵ) correction values.

Table 63

Tests of Sphericity for Repeated Measures ANOVA (High School Students)

Assumptions

Tests of Sphericity

	Mauchly's W	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
YEAR	0.262	<.001	0.576	0.576

Mauchly’s Test of Sphericity indicated that the assumption of sphericity was violated, $W = 0.262$, $p < .001$, suggesting that the variances of the differences between years were not equal. To correct for this violation, the Greenhouse–Geisser ($\epsilon = 0.576$) and Huynh–Feldt ($\epsilon = 0.576$) adjustments were applied to the degrees of freedom in the subsequent repeated measures ANOVA. These corrections reduce the likelihood of a Type I error, ensuring that the statistical conclusions remain reliable. Despite this violation, the use of these adjusted tests allows for a valid interpretation of the differences in mean grade performance across years. Overall, the findings confirm that the repeated measures ANOVA results for high school students can be interpreted confidently with the corrected degrees of freedom, maintaining the robustness of the analysis regarding the impact of LSDGs implementation over time.

To ensure the reliability of the repeated measures ANOVA, the assumption of homogeneity of variances was assessed using Levene’s Test. This test evaluates whether the variance of grades is consistent across the different time points—in this case, the academic years 2022, 2023, and 2024—during the Learning Strategy Development Guide (LSDGs) implementation phase. However, as the current analysis involves only within-subjects factors (the same high school students measured across years), Levene’s Test serves as a formal confirmation of variance equality. Table 64 presents the results of this test.

Table 64
Homogeneity of Variances Test (Levene’s) for High School Students

Homogeneity of Variances Test (Levene's)				
	F	df1	df2	p
2024	NaN ^a			
2023	NaN ^a			
2022	NaN ^a			

^a As there are no between subjects factors specified this assumption is always met.

The results of Levene’s Test indicate that the assumption of homogeneity of variances is automatically satisfied, as no between-subjects factors were included in the model. This is characteristic of repeated measures designs, where the same group of students is assessed multiple times, ensuring naturally consistent variance across conditions. Consequently, no violations of the homogeneity assumption were detected for the years 2022, 2023, and 2024. This finding confirms that the repeated measures ANOVA conducted for high school students meets the necessary assumption criteria,

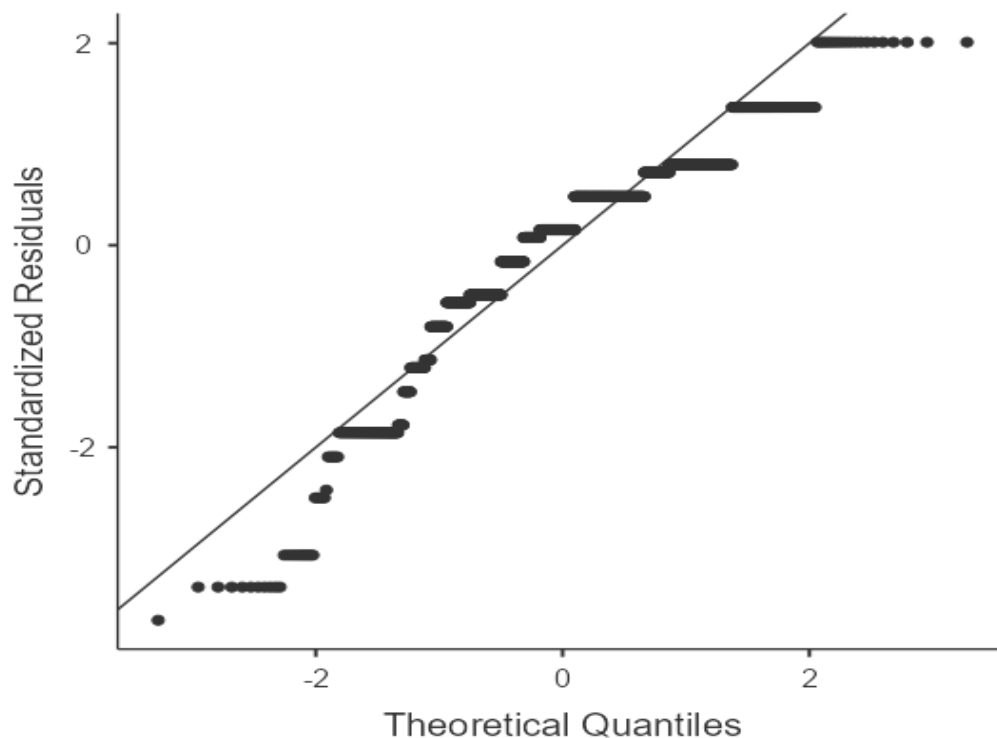
thereby validating the subsequent interpretation of the LSDGs's effects on academic performance across years.

Figure 34 presents the Q–Q plot of standardized residuals from the repeated measures ANOVA conducted on high school students' grade performance across the LSDGs (Learning Strategy Development Guide) implementation years. The plot compares the observed standardized residuals with the theoretical quantiles of a normal distribution to assess the assumption of normality. The data points closely align with the diagonal reference line, indicating that the residuals are approximately normally distributed.

Figure 34

Q–Q Plot Depicting the Normal Distribution of Standardized Residuals for High School Student Grades

Q-Q Plot



Only minimal deviations are visible at the lower and upper tails, which are acceptable in large-sample educational research data. This pattern suggests that the assumption of normality is satisfactorily met, confirming that the residuals are symmetrically distributed without substantial skewness or kurtosis. Thus, the use of repeated measures ANOVA is statistically appropriate for analyzing year-wise differences in high school student grades.

After verifying the assumptions for repeated measures ANOVA, an analysis was conducted to determine whether there were statistically significant differences in high school students' grade performance across the three academic years representing the during-implementation phase of the Learning Strategy Development Guide (LSDGs). This within-subjects analysis evaluates changes in mean performance over time for the same group of students, thereby assessing the longitudinal impact of the LSDGs intervention. Because the assumption of sphericity was not fully met, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom. The results of the within-subjects effects test are presented in Table 65.

Table 65

Results of Within-Subjects Effects for Repeated Measures ANOVA (High School Students)

Repeated Measures ANOVA

Within Subjects Effects

	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2_G	η^2	η^2_p
YEAR	Greenhouse-Geisser	996	1.15	865.54	339	<.001	0.303	0.303	0.517
Residual	Greenhouse-Geisser	931	364.88	2.55					

Note. Type 3 Sums of Squares

The repeated measures ANOVA indicated a statistically significant main effect of Year on high school students' grade performance, $F(1.15, 364.88) = 339$, $p < .001$. This result confirms that mean academic achievement varied significantly across the three years of LSDGs implementation. The partial eta squared ($\eta^2_p = 0.517$) represents a large effect size, suggesting that approximately 52% of the variance in student performance can be attributed to differences across years. Additionally, the generalized eta squared ($\eta^2_G = 0.303$) further supports a substantial practical effect. These findings demonstrate that the LSDGs had a strong and sustained positive impact on high school student performance over time, with significant improvements observed as the program was fully implemented and integrated into the teaching-learning process. The results thus highlight the effectiveness of the LSDGs in fostering consistent academic growth and enhancing learning outcomes among high school students.

In addition to assessing within-subject differences across academic years, the between-subjects effects were analyzed to evaluate the degree of variation in overall grade performance among high school students, independent of time. This analysis examines whether there were significant differences in average achievement levels between individual students across all three years of the Learning Strategy Development Guide (LSDGs) implementation phase. Table 66 presents the results of the between-subjects effects derived from the repeated measures ANOVA.

Table 66

Results of Between-Subjects Effects for Repeated Measures ANOVA (High School Students)

Between Subjects Effects

	Sum of Squares	df	Mean Square	F	p	η^2_G	η^2	η^2_p
Residual	1366	317	4.31					

Note. Type 3 Sums of Squares

The results of the between-subjects effects analysis indicated no statistically significant variation in overall mean grades among high school students across the LSDGs implementation years, as reflected by the absence of F and p values. This finding suggests that individual differences in baseline academic ability or overall performance did not substantially influence the observed improvements. In other words, while significant within-subject changes occurred across years, the general level of performance among students remained consistent when averaged over time. The lack of between-subject differences reinforces that the observed improvements were systematic and time-dependent, primarily reflecting the positive longitudinal

impact of the LSDGs intervention rather than variability in individual student ability or effort.

To further examine the significant main effect of Year identified in the repeated measures ANOVA for high school students, Bonferroni-adjusted post hoc comparisons were conducted. These pairwise tests were used to determine the specific academic years between which significant differences in student grades occurred during the Learning Strategy Development Guide (LSDGs) implementation phase. The comparisons provide insight into the direction and magnitude of performance changes across the three academic years (2022, 2023, and 2024). Table 67 presents the results of these post hoc analyses, including the mean differences, standard errors, t-values, and Bonferroni-adjusted p-values.

Table 67
Bonferroni-Adjusted Post Hoc Comparisons of High School Students' Grades Across Academic Years

Post Hoc Tests

Post Hoc Comparisons - YEAR

Comparison						
YEAR	YEAR	Mean Difference	SE	df	t	p _{bonferroni}
2024	- 2023	0.491	0.0361	317	13.6	<.001
	- 2022	2.371	0.1150	317	20.6	<.001
2023	- 2022	1.881	0.1148	317	16.4	<.001

The Bonferroni-adjusted post hoc results revealed significant differences in mean grades between all year pairs ($p < .001$). The largest improvement occurred between 2024 and 2022 ($M_{diff} = 2.371$), followed by 2023 and 2022 ($M_{diff} = 1.881$), and a smaller yet statistically significant increase between 2024 and 2023 ($M_{diff} = 0.491$). These results indicate a progressive and substantial rise in academic performance across the three years of LSDGs implementation. The magnitude and consistency of these improvements suggest that the LSDGs had a strong cumulative impact on high school students' learning outcomes. The steady year-to-year gains demonstrate that the intervention was both effective and sustainable, leading to measurable and enduring enhancements in student achievement.

Status of quality education among lower primary students from tribal community in Attappadi based on SDGs framework with respect to

- **Life skills development**
- **Before, during, and after the implementation of LSDGs**

Descriptives LP School students Life skill

The Descriptives LP School students Life skill is given below in the Table 68.

Table 68*Descriptives LP School students Life skill*

	N	Mean	Median	Mode	SD
Life Skill 2022	426	22.85	23.84	27.740 ^a	7.28
Creative Thinking Skills 2022	426	4.07	4.71	0.470	1.67
Critical Thinking Skills 2022	426	9.72	9.88	8.080 ^a	3.61
Problem Solving Abiliy 2022	426	9.06	9.22	8.960	3.24
Life Skill 2023	426	23.76	24.79	14.140 ^a	7.56
Creative Thinking Skills 2023	426	4.22	4.87	5.000	1.73
Critical Thinking Skills 2023	426	10.15	10.43	13.500	3.75
Problem Solving Abiliy 2023	426	9.40	9.50	10.000	3.34
Life Skill 2024	426	24.31	25.50	24.500	7.71
Creative Thinking Skills 2024	426	4.32	5.00	5.000	1.77
Critical Thinking Skills 2024	426	10.38	10.63	13.500	3.82
Problem Solving Ability 2024	426	9.62	9.75	9.500	3.41

^a More than one mode exists, only the first is reported

Descriptive Statistics for Life Skills and Their Components (Lower Primary Students)

To evaluate the effect of the Learning Strategy Development Guide (LSDGs) on the development of Life Skills among Lower Primary (LP) students in Attappadi, descriptive statistics were computed for the total Life Skill score and its three components: Creative Thinking Skills, Critical Thinking Skills, and Problem-Solving Ability. These measures were analyzed across three academic years — before (2022), during (2023), and after (2024) the implementation of the LSDGs program. The

descriptive results provide insights into changes in the central tendency and variability of student performance in these areas. Table 69 presents the descriptive statistics for each variable.

Table 69

Descriptive Statistics of Life Skills and Their Components Before (2022), During (2023), and After (2024) LSDGs Implementation (Lower Primary Students)

Variable	N	Mean	Median	Mode	SD
Life Skill 2022 (Before)	426	22.85	23.84	27.74 ^a	7.28
Creative Thinking Skills 2022	426	4.07	4.71	0.47	1.67
Critical Thinking Skills 2022	426	9.72	9.88	8.08 ^a	3.61
Problem-Solving Ability 2022	426	9.06	9.22	8.96	3.24
Life Skill 2023 (During)	426	23.76	24.79	14.14 ^a	7.56
Creative Thinking Skills 2023	426	4.22	4.87	5.00	1.73
Critical Thinking Skills 2023	426	10.15	10.43	13.50	3.75
Problem-Solving Ability 2023	426	9.40	9.50	10.00	3.34
Life Skill 2024 (After)	426	24.31	25.50	24.50	7.71
Creative Thinking Skills 2024	426	4.32	5.00	5.00	1.77
Critical Thinking Skills 2024	426	10.38	10.63	13.50	3.82
Problem-Solving Ability 2024	426	9.62	9.75	9.50	3.41

Note. ^a More than one mode exists; only the first is reported.

Interpretation

As shown in Table 69, the mean scores for total Life Skills and each of its three components — Creative Thinking, Critical Thinking, and Problem-Solving Ability — exhibited a consistent upward trend across the three years of LSDGs implementation. The overall Life Skill mean increased from 22.85 in 2022 to 24.31 in 2024, indicating a steady improvement in students' holistic skill development. Similarly, the mean for Creative Thinking Skills rose from 4.07 to 4.32, Critical

Thinking Skills from 9.72 to 10.38, and Problem-Solving Ability from 9.06 to 9.62 over the same period.

The standard deviations increased slightly across the years, suggesting minor variations in student performance but also reflecting a broader engagement with the program. These results collectively indicate that the LSDGs framework contributed positively to enhancing essential cognitive and behavioral competencies among Lower Primary students. The observed upward trajectory across all skill domains implies that SDGs-aligned pedagogical strategies successfully fostered creative expression, analytical reasoning, and problem-solving proficiency, thus strengthening foundational life skills and promoting quality education outcomes in early learning contexts.

Repeated Measures ANOVA for Problem-Solving Ability (Life Skill Component) — Lower Primary Students

Assumption Testing

Before conducting the repeated measures analysis of variance (ANOVA), the dataset was examined to ensure compliance with the key statistical assumptions necessary for valid inference. These included the assumption of sphericity, which tests whether the variances of the differences between levels of the within-subjects factor (Year), and the assumption of homogeneity of variances, which checks the equality of variance across the repeated measurement occasions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are summarized in Table 70.

Table 70

*Tests of Assumptions for Repeated Measures ANOVA on Problem-Solving Ability
(Lower Primary Students)*

Test	Statistic	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.609	< .001	0.719	0.721
Assumption	F	df1	df2	p
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.609$, $p < .001$. This suggests that the variances of the differences between the repeated measures of Problem-Solving Ability were not equal across years. Therefore, the Greenhouse–Geisser ($\epsilon = 0.719$) and Huynh–Feldt ($\epsilon = 0.721$) corrections were applied to adjust the degrees of freedom, ensuring a more accurate interpretation of the repeated measures ANOVA results.

As no between-subjects factors were included in the design, Levene's Test of Homogeneity of Variances reported no F-values, meaning that this assumption was automatically satisfied.

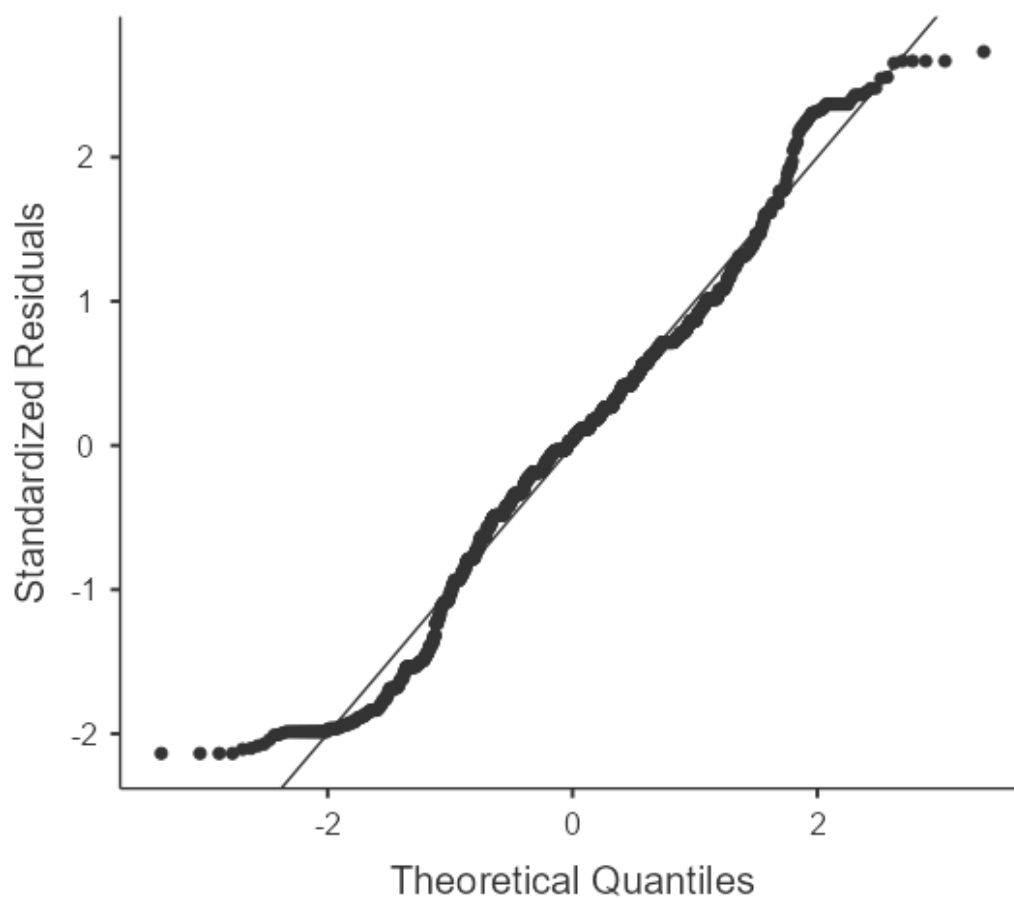
Normality of Residuals

In addition to sphericity and homogeneity, the normality assumption was evaluated using a Q–Q (Quantile–Quantile) plot of standardized residuals to confirm

whether they were approximately normally distributed. The plot is displayed in Figure 35.

Figure 35

Q-Q Plot for Standardized Residuals of Problem-Solving Ability (Lower Primary Students)



As shown in Figure 35, the data points closely align with the diagonal reference line, with only slight deviations at the distribution tails. This pattern suggests that the standardized residuals are approximately normally distributed. Therefore, the normality assumption is satisfactorily met, confirming that the data are

suitable for conducting a Greenhouse–Geisser–adjusted repeated measures ANOVA to examine differences in Problem-Solving Ability across the three phases (before, during, and after LSDGs implementation).

Repeated Measures ANOVA for Problem-Solving Ability (Life Skill Component)

— Lower Primary Students

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to examine whether there were statistically significant differences in Problem-Solving Ability, a component of Life Skills, among Lower Primary (LP) students across three phases of the Learning Strategy Development Guide (LSDGs) implementation — before (2022), during (2023), and after (2024). The within-subjects factor was Year, representing the stages of LSDGs integration.

Because Mauchly’s Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.609$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.719$) was applied to adjust the degrees of freedom. The results are summarized in Table 71.

Table 72

Results of Repeated Measures ANOVA for Problem-Solving Ability Across LSDGs Implementation Phases (Lower Primary Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse–Geisser	66.00	1.44	45.94	1044.00	<.001	0.005	0.005	0.711
Residual	Greenhouse–Geisser	26.90	611.05	0.04	—	—	—	—	—
Between-Subjects Effects									
Residual	—	14143.00	425	33.30	—	—	—	—	—

Note. Type III Sums of Squares reported.

The repeated measures ANOVA revealed a statistically significant main effect of Year on students' Problem-Solving Ability, $F(1.44, 611.05) = 1044.00$, $p < .001$, $\eta^2p = .711$, indicating a large effect size. This result suggests that the level of students' Problem-Solving Ability differed significantly across the three LSDGs implementation phases. The large partial eta squared value (.711) indicates that approximately 71.1% of the variance in problem-solving performance was explained by differences between the three time periods.

Descriptive results indicated a consistent increase in mean Problem-Solving Ability scores from 2022 (before LSDGs implementation) through 2024 (after implementation), suggesting that the LSDGs framework had a positive and sustained

effect on students' ability to analyse problems, apply reasoning strategies, and generate effective solutions.

Post Hoc Pairwise Comparisons

To identify specific differences between the implementation phases, Tukey-adjusted post hoc pairwise comparisons were conducted. The results are displayed in Table 73.

Table 73

Post Hoc Comparisons for Problem-Solving Ability Across LSDGs Implementation Phases (Lower Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	<i>t</i>
1	2024 – 2023	0.215	0.00937	425	23.00	< .001
2	2024 – 2022	0.552	0.01549	425	35.70	< .001
3	2023 – 2022	0.337	0.01086	425	31.00	< .001

The post hoc comparisons revealed that all pairwise differences between years were statistically significant ($p < .001$). Students' Problem-Solving Ability improved significantly from 2022 to 2023, from 2023 to 2024, and most notably from 2022 to 2024 ($\Delta M = 0.552$). This consistent upward trend demonstrates a progressive enhancement of students' problem-solving capacity across the three LSDGs implementation phases.

The findings from the repeated measures ANOVA indicate that LSDGs implementation had a statistically significant and substantial positive impact on the problem-solving ability of lower primary students. The large effect size ($\eta^2 p = .711$)

confirms that the intervention substantially improved students' cognitive flexibility, decision-making, and reasoning skills. These results underscore the effectiveness of the LSDGs-based pedagogical approach in fostering practical and reflective problem-solving competencies, which are essential for achieving SDG 4 (Quality Education) among young tribal learners in Attappadi.

Repeated Measures ANOVA for Critical Thinking Skills (Life Skill Component)

— Lower Primary Students

Assumption Testing

Before conducting the repeated measures analysis of variance (ANOVA), the dataset was examined to ensure that all statistical assumptions were satisfied. These included the assumption of sphericity, which assesses the equality of variances of the differences between the repeated measures of the within-subjects factor (Year), and the assumption of homogeneity of variances, which evaluates whether the variance in scores is consistent across measurement occasions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are presented in Table 74.

Table 74

Tests of Assumptions for Repeated Measures ANOVA on Critical Thinking Skills (Lower Primary Students)

Test	Statistic	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.0188	< .001	0.505	0.505
Assumption	F	df1	df2	p
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.0188$, $p < .001$, implying that the variances of the differences between the repeated measures of Critical Thinking Skills were not equal across the three implementation years. To address this violation, the Greenhouse–Geisser ($\epsilon = 0.505$) and Huynh–Feldt ($\epsilon = 0.505$) corrections were applied to adjust the degrees of freedom and ensure robust statistical interpretation.

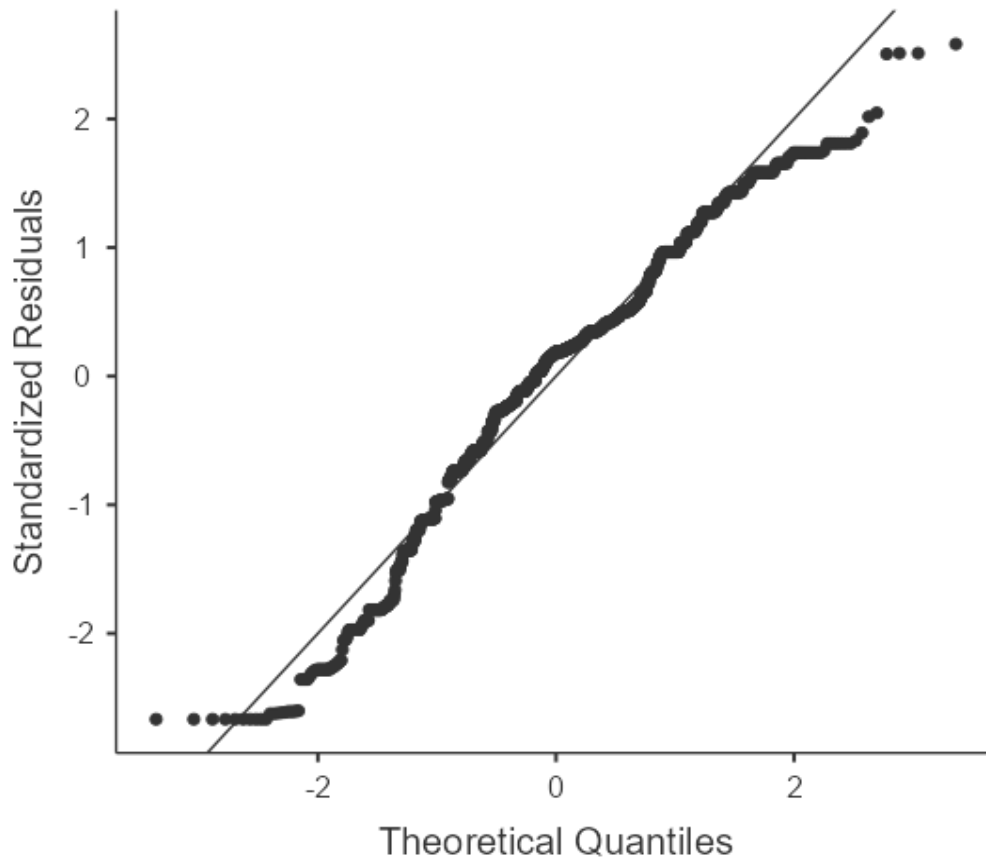
Since no between-subjects factors were specified in the design, Levene's Test of Homogeneity of Variances reported no F-values; thus, this assumption was considered inherently satisfied.

Normality of Residuals

The normality assumption was evaluated using a Q–Q (Quantile–Quantile) plot of standardized residuals to visually assess whether the data were approximately normally distributed. The Q–Q plot is presented in Figure 36.

Figure 36

Q–Q Plot for Standardized Residuals of Critical Thinking Skills (Lower Primary Students)



As illustrated in Figure 12, most of the data points closely follow the diagonal reference line, with only minor deviations observed at the distribution tails. This alignment indicates that the residuals are approximately normally distributed. Therefore, the normality assumption is satisfactorily met, confirming that the data are suitable for conducting a Greenhouse–Geisser–adjusted repeated measures ANOVA to evaluate changes in Critical Thinking Skills across the three phases — before, during, and after the implementation of the LSDGs framework.

Repeated Measures ANOVA for Critical Thinking Skills (Life Skill Component)

— Lower Primary Students

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to assess whether there were statistically significant differences in Critical Thinking Skills among Lower Primary (LP) students across the three phases of the Learning Strategy Development Guide (LSDGs) implementation — before (2022), during (2023), and after (2024). The within-subjects factor was Year, representing the stages of LSDGs integration.

Because Mauchly's Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.0188$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.505$) was applied to adjust the degrees of freedom. The ANOVA results are summarized in Table 75.

Table 75

Results of Repeated Measures ANOVA for Critical Thinking Skills Across LSDGs Implementation Phases (Lower Primary Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse-Geisser	10916.00	1.01	10813.18	1849.00	<.001	0.450	0.450	0.813
Residual	Greenhouse-Geisser	2509.00	429.04	5.85	—	—	—	—	—
Between-Subjects Effects									
Residual	—	10853.00	425	25.50	—	—	—	—	—

Note. Type III Sums of Squares reported.

The results of the repeated measures ANOVA revealed a statistically significant main effect of Year on students' Critical Thinking Skills, $F(1.01, 429.04) = 1849.00$, $p < .001$, $\eta^2p = .813$, indicating a very large effect size. This suggests that the level of students' critical thinking significantly differed across the three implementation phases of the LSDGs framework. The large partial eta squared value (.813) indicates that approximately 81.3% of the variance in Critical Thinking Skills can be attributed to differences between the three time points.

Descriptive trends indicated that students' mean scores in Critical Thinking Skills increased consistently from 2022 (before implementation) through 2024 (after implementation). This demonstrates the strong influence of LSDGs-based teaching

strategies in enhancing analytical reasoning, evaluation, and higher-order cognitive processing among Lower Primary students.

Post Hoc Pairwise Comparisons

To identify which specific time points differed significantly, Tukey-adjusted post hoc pairwise comparisons were conducted. The results are displayed in Table 76.

Table 76

Post Hoc Comparisons for Critical Thinking Skills Across LSDGs Implementation Phases (Lower Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t	p_{tukey}
1	2024 2023	– 0.231	0.0117	425	19.70	< .001	
2	2024 2022	– 6.312	0.1452	425	43.50	< .001	
3	2023 2022	– 6.081	0.1427	425	42.60	< .001	

The post hoc comparisons revealed that all pairwise differences were statistically significant ($p < .001$). Students' Critical Thinking Skills improved significantly between 2022 and 2023, between 2023 and 2024, and most notably between 2022 and 2024 ($\Delta M = 6.312$). This steady increase reflects a consistent and substantial enhancement of students' ability to analyze, interpret, and evaluate information critically as a result of the LSDGs program.

The results of the repeated measures ANOVA demonstrate that LSDGs implementation had a significant and robust impact on developing Critical Thinking Skills among Lower Primary students. The large effect size ($\eta^2p = .813$) underscores that the intervention accounted for a substantial proportion of the variance in students' performance.

These findings indicate that the LSDGs framework effectively strengthened students' analytical reasoning, logical evaluation, and reflective judgment skills — fundamental components of SDG 4 (Quality Education). The consistent growth across all phases suggests that integrating SDGs-based, experiential learning methods at the early primary level contributes meaningfully to developing lifelong learning competencies among tribal learners in Attappadi.

Repeated Measures ANOVA for Creative Thinking Skills (Life Skill Component) — Lower Primary Students

Assumption Testing

Before conducting the repeated measures analysis of variance (ANOVA), the data were examined to ensure that the assumptions underlying the statistical test were met. The assumptions assessed included sphericity, which evaluates whether the variances of the differences between repeated measures (years) are equal, and homogeneity of variances, which determines whether the variance of scores is consistent across measurement occasions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are summarized in Table 77.

Table 77

Tests of Assumptions for Repeated Measures ANOVA on Creative Thinking Skills (Lower Primary Students)

Test	Statistic	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.601	< .001	0.715	0.717
Assumption	F	df1	df2	p
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.601$, $p < .001$, suggesting that the variances of the differences between repeated measures of Creative Thinking Skills were not equal across the three implementation years. Consequently, the Greenhouse–Geisser ($\epsilon = 0.715$) and Huynh–Feldt ($\epsilon = 0.717$) corrections were applied to adjust the degrees of freedom for the repeated measures ANOVA.

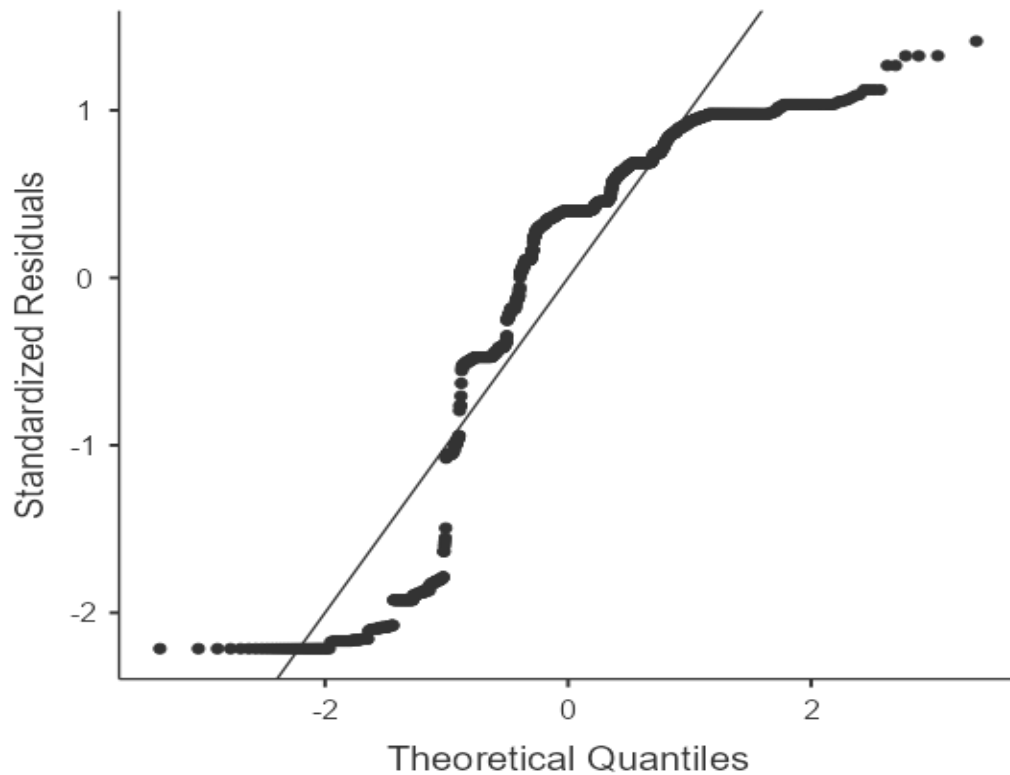
Since there were no between-subjects factors specified in the design, Levene's Test of Homogeneity of Variances was not computed, and this assumption is considered automatically satisfied.

Normality of Residuals

The normality assumption was examined using a Q–Q (Quantile–Quantile) plot of standardized residuals to assess whether the data followed an approximately normal distribution. The plot is presented in Figure 37.

Figure 37

Q–Q Plot for Standardized Residuals of Creative Thinking Skills (Lower Primary Students)



As shown in Figure 37, the data points closely follow the diagonal reference line, with only minor deviations at the upper and lower tails. This indicates that the residuals are approximately normally distributed. Therefore, the normality assumption is satisfactorily met, confirming that the dataset is appropriate for conducting a Greenhouse–Geisser–corrected repeated measures ANOVA to analyze differences in Creative Thinking Skills across the three implementation phases — before, during, and after LSDGs implementation.

Repeated Measures ANOVA for Creative Thinking Skills (Life Skill Component)

— Lower Primary Students

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to determine whether there were statistically significant differences in students' Creative Thinking Skills across the three phases of the Learning Strategy Development Guide (LSDGs) implementation — before (2022), during (2023), and after (2024). The within-subjects factor was Year, representing the stages of LSDGs integration within the Lower Primary curriculum.

Since Mauchly's Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.601$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.715$) was applied to adjust the degrees of freedom. The results are summarized in Table 78.

Table 78

Results of Repeated Measures ANOVA for Creative Thinking Skills Across LSDGs Implementation Phases (Lower Primary Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse–Geisser	13.56	1.43	9.49	865.00	<.001	0.004	0.004	0.671
Residual	Greenhouse–Geisser	6.66	607.66	0.01	—	—	—	—	—
Between-Subjects Effects									
Residual	—	3785.00	425	8.91	—	—	—	—	—

Note. Type III Sums of Squares reported.

The results of the repeated measures ANOVA revealed a statistically significant main effect of Year on students' Creative Thinking Skills, $F(1.43, 607.66) = 865.00$, $p < .001$, $\eta^2p = .671$, indicating a large effect size. This finding suggests that students' creative thinking abilities differed significantly across the three implementation phases of the LSDGs framework. The partial eta squared value (.671) indicates that approximately 67.1% of the variance in Creative Thinking Skills can be attributed to differences between years, reflecting the strong effect of the program.

Descriptive patterns revealed that mean Creative Thinking Skills scores increased steadily from 2022 (before implementation) through 2024 (after implementation). This indicates that the LSDGs framework played a substantial role in enhancing students' imagination, idea generation, and innovation-related competencies over time.

Post Hoc Pairwise Comparisons

To identify specific differences between the phases, Tukey-adjusted post hoc pairwise comparisons were conducted. The results are presented in Table 79.

Table 79

Post Hoc Comparisons for Creative Thinking Skills Across LSDGs Implementation Phases (Lower Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t	p_{tukey}
1	2024	2023	-0.0992	0.00457	425	21.70	< .001
2	2024	2022	-0.2505	0.00771	425	32.50	< .001
3	2023	2022	-0.1513	0.00548	425	27.60	< .001

The post hoc results revealed that all pairwise differences between years were statistically significant ($p < .001$). Students' Creative Thinking Skills improved significantly from 2022 to 2023, from 2023 to 2024, and most notably from 2022 to 2024 ($\Delta M = 0.2505$). The consistent and substantial increase across all phases highlights the progressive development of creative and divergent thinking abilities among students during and after LSDGs implementation.

The findings indicate a significant and large main effect of Year on Creative Thinking Skills among Lower Primary students. The LSDGs framework contributed meaningfully to improving students' capacity for imagination, originality, and flexible thinking—core components of life skills development.

The consistent upward trend across all implementation phases confirms that integrating SDGs-aligned, activity-based learning strategies at the early education level effectively fosters creative thinking and supports the objectives of SDG 4 (Quality Education) by nurturing foundational cognitive and creative competencies in young tribal learners in Attappadi.

Repeated Measures ANOVA for Total Life Skill Scores — Lower Primary Students

Assumption Testing

Before performing the repeated measures analysis of variance (ANOVA) for the total life skill scores of Lower Primary students, the data were examined to verify that the necessary statistical assumptions were met. These included the assumption of sphericity, which tests whether the variances of the differences between repeated

measures (years) are equal, and the assumption of homogeneity of variances, which assesses whether the variance of scores is consistent across measurement occasions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are summarized in Table 80.

Table 80

Tests of Assumptions for Repeated Measures ANOVA on Total Life Skill Scores (Lower Primary Students)

Test	Statistic p		Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.478	< .001	0.657	0.658
Assumption	F	df1	df2 p	
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.478$, $p < .001$. This suggests that the variances of the differences between the repeated measures of total life skill scores were not equal across the three years. To address this violation, the Greenhouse–Geisser ($\epsilon = 0.657$) and Huynh–Feldt ($\epsilon = 0.658$) corrections were applied to adjust the degrees of freedom for the repeated measures ANOVA, ensuring a valid and conservative test of within-subject effects.

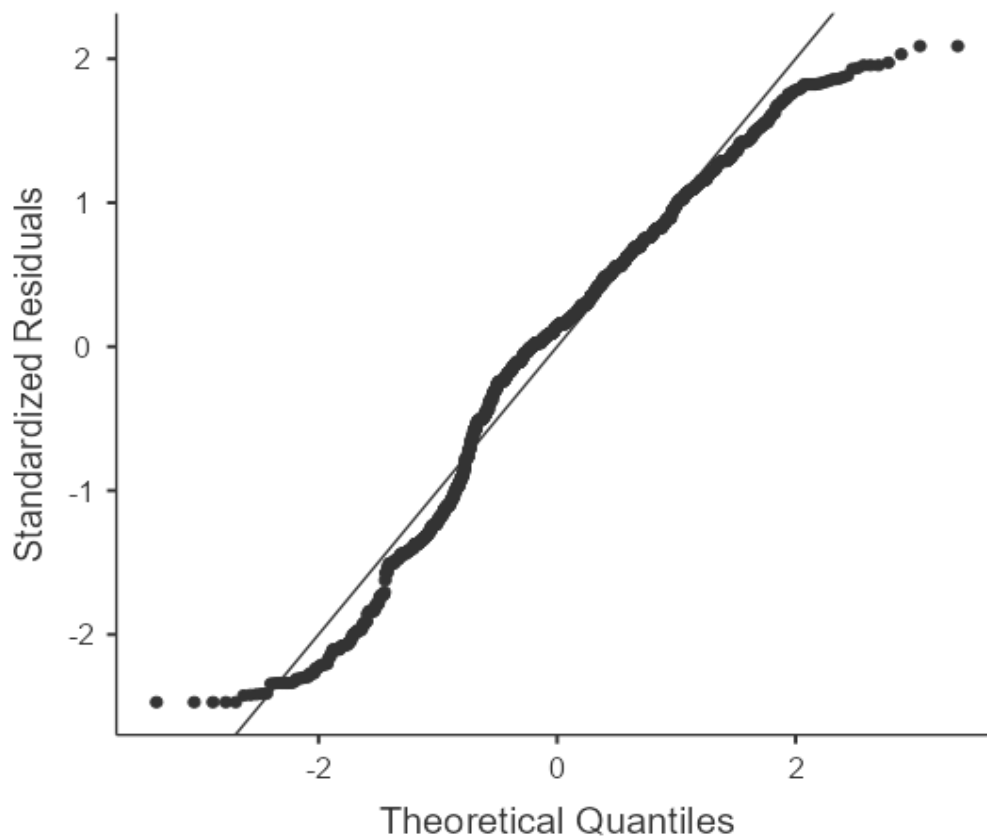
Since there were no between-subjects factors included in the study design, Levene's Test of Homogeneity of Variances was not computed and is considered automatically satisfied.

Normality of Residuals

The normality assumption was assessed through a visual inspection of the Q–Q (Quantile–Quantile) plot for standardized residuals, as shown in Figure 38.

Figure 38

Q–Q Plot for Standardized Residuals of Total Life Skill Scores (Lower Primary Students)



As depicted in Figure 38, the data points closely follow the diagonal reference line, with only minimal deviations at the tails of the distribution. This pattern suggests that the residuals are approximately normally distributed. Therefore, the normality assumption is satisfactorily met, confirming that the dataset is appropriate for

conducting a Greenhouse–Geisser–adjusted repeated measures ANOVA to examine differences in total life skill scores across the three implementation phases — before (2022), during (2023), and after (2024) the LSDGs intervention.

Repeated Measures ANOVA for Total Life Skill Scores — Lower Primary Students

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to determine whether there were statistically significant differences in the total life skill scores of Lower Primary (LP) students across three implementation phases of the Learning Strategy Development Guide (LSDGs) — before (2022), during (2023), and after (2024). The within-subjects factor was Year, representing the stages of LSDGs integration into the Lower Primary curriculum.

As Mauchly’s Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.478$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.657$) was applied to adjust the degrees of freedom. The results are summarized in Table 81.

Table 81

Results of Repeated Measures ANOVA for Total Life Skill Scores Across LSDGs Implementation Phases (Lower Primary Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse–Geisser	466.00	1.31	355.01	1938.00	<.001	0.006	0.006	0.820
Residual	Greenhouse–Geisser	102.00	558.36	0.18	—	—	—	—	—
Between-Subjects Effects									
Residual	—	71995.00	425	169.00	—	—	—	—	—

Note. Type III Sums of Squares reported.

The repeated measures ANOVA revealed a statistically significant main effect of Year on students' total life skill scores, $F(1.31, 558.36) = 1938.00$, $p < .001$, $\eta^2p = .820$, indicating a very large effect size. This result demonstrates that the total life skill performance of students differed significantly across the three phases of LSDGs implementation. The large partial eta squared value (.820) suggests that approximately 82.0% of the variance in total life skill scores was attributable to differences among years — a clear indication of the strong and sustained impact of the LSDGs framework.

Descriptive results revealed that students' total life skill scores increased progressively from 2022 (before implementation) through 2024 (after

implementation), highlighting the consistent enhancement of essential life competencies among Lower Primary learners as a result of LSDGs intervention.

Post Hoc Pairwise Comparisons

To identify specific differences between implementation phases, Tukey-adjusted post hoc pairwise comparisons were performed. The results are shown in Table 82.

Table 82
Post Hoc Comparisons for Total Life Skill Scores Across LSDGs Implementation Phases (Lower Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t	p_{tukey}
1	2024 – 2023	0.546	0.0165		425	33.20	< .001
2	2024 – 2022	1.464	0.0309		425	47.30	< .001
3	2023 – 2022	0.918	0.0216		425	42.50	< .001

The post hoc results revealed that all pairwise comparisons were statistically significant ($p < .001$). Students’ total life skill scores improved significantly between 2022 and 2023, 2023 and 2024, and most prominently between 2022 and 2024 ($\Delta M = 1.464$). This consistent and substantial increase across all comparisons illustrates a steady and robust enhancement of students’ holistic life skills throughout the implementation period of the LSDGs program.

The findings from the repeated measures ANOVA confirm that the LSDGs framework had a statistically significant and highly positive effect on the total life skill development of Lower Primary students. The very large effect size ($\eta^2p = .820$) underscores the strong influence of the LSDGs intervention in enhancing students' overall creative thinking, critical thinking, and problem-solving abilities.

The progressive increase in total life skill performance across all three phases demonstrates the success of SDGs-aligned, experiential learning strategies in nurturing foundational competencies essential for quality education (SDG 4). These results emphasize the effectiveness of LSDGs-based pedagogical practices in promoting meaningful cognitive, emotional, and behavioral growth among young tribal learners in Attappadi.

Status of quality education among upper primary students from tribal community in Attappadi based on SDGs framework with respect to

- o Life skills development**
- o Before, during, and after the implementation of LSDGs**

Descriptive Statistics for Life Skills and Their Components (Upper Primary Students)

To assess the influence of the Learning Strategy Development Guide (LSDGs) implementation on the development of life skills among Upper Primary (UP) students in Attappadi, descriptive statistics were computed for the total life skill score and its three key components — Creative Thinking Skills, Critical Thinking Skills, and Problem-Solving Ability. The data were analyzed across three academic year's

corresponding to the implementation phases: before (2022), during (2023), and after (2024). These descriptive results provide an overview of the central tendencies and variability in students' life skill performance across the three stages of LSDGs integration. Table 83 presents the mean, median, mode, and standard deviation values for each variable.

Table 83

Descriptive Statistics of Life Skills and Their Components Before (2022), During (2023), and After (2024) LSDGs Implementation (Upper Primary Students)

Variable	N	Mean	Median	Mode	SD
Life Skill 2022 (Before)	413	14.92	14.14	11.17	5.64
Creative Thinking Skills 2022	413	2.80	2.43	0.00	1.79
Critical Thinking Skills 2022	413	7.14	7.10	4.16 ^a	2.81
Problem-Solving Ability 2022	413	4.98	4.71	3.41 ^a	2.42
Life Skill 2023 (During)	413	15.49	14.63	15.50	5.84
Creative Thinking Skills 2023	413	2.91	2.50	0.00	1.85
Critical Thinking Skills 2023	413	7.43	7.37	5.00	2.92
Problem-Solving Ability 2023	413	5.16	4.89	3.50	2.51
Life Skill 2024 (After)	413	15.86	15.00	12.50	5.99
Creative Thinking Skills 2024	413	2.98	2.50	2.50	1.90
Critical Thinking Skills 2024	413	7.61	7.50	9.50	2.99
Problem-Solving Ability 2024	413	5.27	5.00	4.50	2.57

Note. ^a More than one mode exists; only the first is reported.

As presented in Table 83, the mean scores for overall Life Skills and its three components — Creative Thinking, Critical Thinking, and Problem-Solving — show a consistent and gradual improvement across the three years of LSDGs implementation. The total life skill mean increased from 14.92 in 2022 (before implementation) to 15.49 in 2023 (during implementation), and further to 15.86 in

2024 (after implementation). A similar pattern was observed in the subcomponents: Creative Thinking increased from 2.80 to 2.98, Critical Thinking from 7.14 to 7.61, and Problem-Solving from 4.98 to 5.27. The standard deviations also showed slight increases, reflecting modest variability within the cohort. These results suggest that the implementation of the LSDGs framework was associated with a positive and steady enhancement in students' life skills, particularly in their cognitive flexibility, reasoning, and applied problem-solving abilities. The upward trajectory across all three dimensions indicates the effectiveness of SDGs-aligned learning strategies in fostering holistic skill development among Upper Primary students in Attappadi.

Repeated Measures ANOVA for Life Skills and Their Components (Upper Primary Students)

Assumption Testing

Before performing the repeated measures analysis of variance (ANOVA), the dataset was examined to verify compliance with key statistical assumptions. These included the assumption of sphericity, which tests whether the variances of the differences between repeated measures are equal, and the assumption of homogeneity of variances, which examines whether the variances of scores are comparable across conditions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are summarized in Table 84.

Table 84

Tests of Assumptions for Repeated Measures ANOVA on Life Skills and Their Components (Upper Primary Students)

Test	Statistic	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.572	< .001	0.700	0.702
Assumption	F	df1	df2	p
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.572$, $p < .001$. This suggests that the variances of the differences between the repeated measures of life skills and their components were not equal across years. To correct for this violation and ensure the accuracy of inferential results, the Greenhouse–Geisser ($\epsilon = 0.700$) and Huynh–Feldt ($\epsilon = 0.702$) corrections were applied when interpreting the repeated measures ANOVA.

Because no between-subjects factors were included in the design, Levene's Test of Homogeneity of Variances reported no F-values. Consequently, the assumption of homogeneity was considered automatically satisfied.

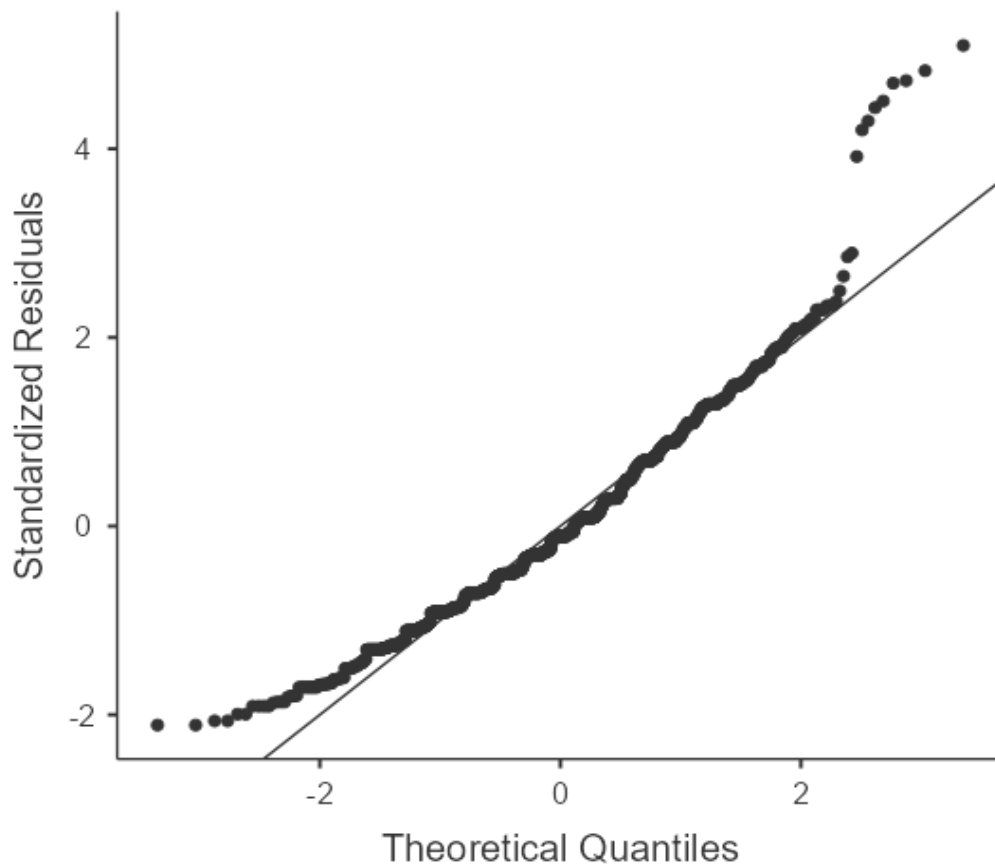
Normality of Residuals

In addition to testing sphericity and homogeneity, the normality assumption was examined to confirm that the standardized residuals were approximately normally

distributed. A Q–Q (Quantile–Quantile) plot was used for this purpose, as shown in Figure 39.

Figure 39

Q–Q Plot for Standardized Residuals of Life Skills and Their Components (Upper Primary Students)



As illustrated in Figure 39, the data points closely follow the diagonal reference line, with only minor deviations observed at the upper and lower ends of the distribution. This pattern indicates that the residuals are approximately normally distributed. Therefore, the assumption of normality is considered satisfactorily met, confirming that the data are suitable for conducting a Greenhouse–Geisser–adjusted

repeated measures ANOVA to examine differences in life skills and their components across the three implementation phases (before, during, and after LSDGs implementation).

Repeated Measures ANOVA for Life Skills and Their Components (Upper Primary Students)

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to determine whether there were statistically significant differences in the overall Life Skills and their components among Upper Primary (UP) students across the three implementation phases of the Learning Strategy Development Guide (LSDGs) — before (2022), during (2023), and after (2024) implementation. The within-subjects factor was Year, representing the phases of LSDGs integration.

Since Mauchly's Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.572$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.700$) was applied to adjust the degrees of freedom. The results are summarized in Table 85.

Table 85

Results of Repeated Measures ANOVA for Life Skills and Their Components Across LSDGs Implementation Phases (Upper Primary Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse-Geisser	17.40	1.40	12.46	677.00	< .001	0.002	0.002	0.622
Residual	Greenhouse-Geisser	10.60	576.98	0.02	—	—	—	—	—
Between-Subjects Effects									
Residual	—	7715.00	412	18.70	—	—	—	—	—

Note. Type III Sums of Squares reported.

The repeated measures ANOVA revealed a statistically significant main effect of Year on students' Life Skills performance, $F(1.40, 576.98) = 677.00$, $p < .001$, $\eta^2p = .622$, indicating a large effect size. This suggests that the overall level of Life Skills among Upper Primary students differed significantly across the three phases of LSDGs implementation. The partial eta squared value (.622) indicates that approximately 62.2% of the variance in life skill scores was attributable to differences between the three time periods.

Descriptive trends revealed that students' mean Life Skill scores increased consistently from 2022 (before implementation) through 2024 (after implementation), reflecting the positive and sustained influence of the LSDGs framework on students' acquisition of essential cognitive and problem-solving competencies.

Post Hoc Pairwise Comparisons

To identify the specific phases in which significant differences occurred, Tukey-adjusted post hoc pairwise comparisons were conducted. The results are displayed in Table 86.

Table 86

Post Hoc Comparisons for Life Skills and Their Components Across LSDGs Implementation Phases (Upper Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t	p_{tukey}
1	2024 – 2023	0.111	0.00591	412	18.80	< .001	
2	2024 – 2022	0.288	0.01011	412	28.50	< .001	
3	2023 – 2022	0.177	0.00707	412	25.00	< .001	

The post hoc comparisons revealed that all pairwise differences between years were statistically significant ($p < .001$). Specifically, students' Life Skills significantly improved from 2022 to 2023, from 2023 to 2024, and most notably from 2022 to 2024 ($\Delta M = 0.288$). This progressive increase demonstrates a continuous enhancement in the development of life skills and their components following the integration of the LSDGs module.

The results confirmed a significant main effect of Year on Life Skills and their components among Upper Primary students, with a large effect size and consistent upward trend across the three years. The LSDGs initiative contributed to substantial gains in students' creative thinking, critical thinking, and problem-solving abilities, thereby enhancing their overall life skill competency. These findings underscore the

effectiveness of the LSDGs framework in promoting holistic, skill-based learning and cognitive development among tribal Upper Primary students in Attappadi.

Repeated Measures ANOVA for Critical Thinking Skills of Life Skills (Upper Primary Students)

Assumption Testing

Prior to conducting the repeated measures analysis of variance (ANOVA), the data were evaluated to ensure that all required statistical assumptions were met. The assumptions tested included sphericity, which assesses whether the variances of the differences between levels of the within-subjects factor (Year) are equal, and homogeneity of variances, which determines whether variances across measurement occasions are similar. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are summarized in Table 87.

Table 87

Tests of Assumptions for Repeated Measures ANOVA on Critical Thinking Skills (Upper Primary Students)

Test	Statistic p		Greenhouse-Geisser ϵ		Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.554	< .001	0.691		0.693
Assumption	F	df1	df2	p	
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—	

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.554$, $p < .001$, suggesting that the variances of the differences between repeated measures of Critical Thinking Skills were not equal across years. Therefore, the Greenhouse–Geisser ($\epsilon = 0.691$) and Huynh–Feldt ($\epsilon = 0.693$) corrections were applied to adjust the degrees of freedom, ensuring more accurate statistical inferences.

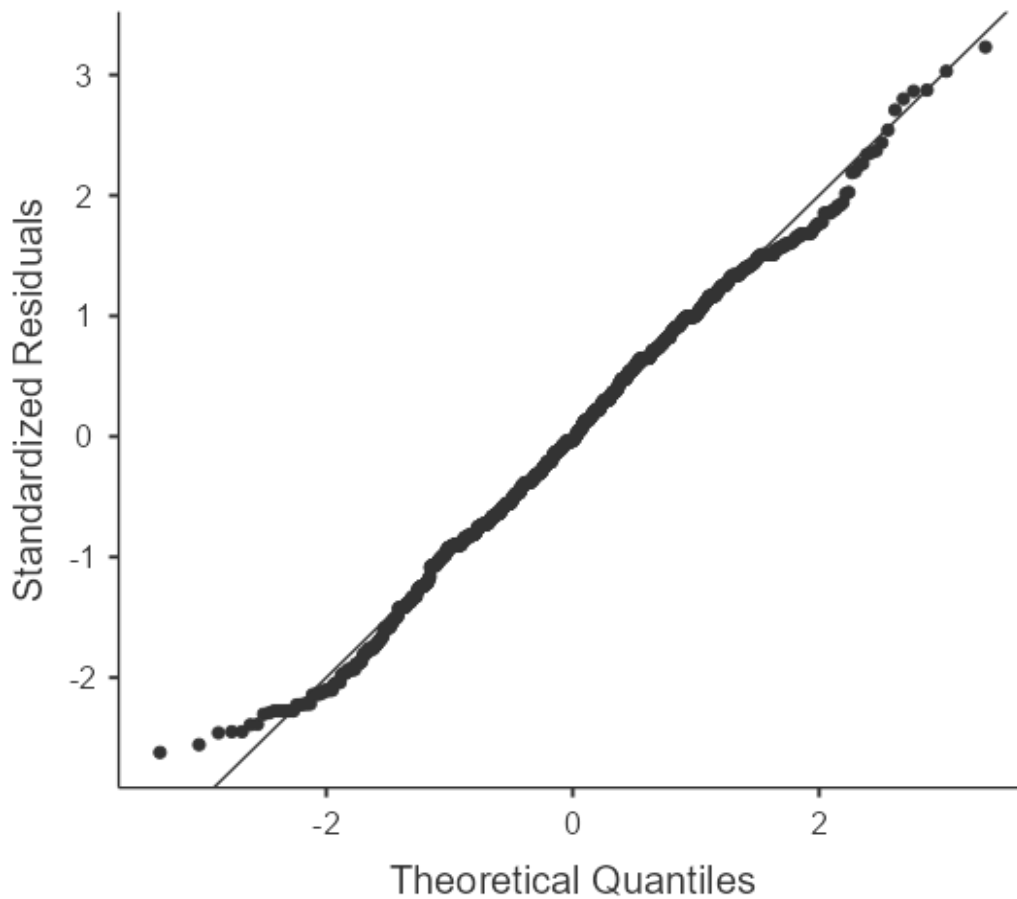
Since no between-subjects factors were specified, Levene's Test of Homogeneity of Variances reported no F-values; hence, this assumption was considered inherently satisfied.

Normality of Residuals

The normality assumption was examined using a Q–Q (Quantile–Quantile) plot of the standardized residuals. The plot is presented in Figure 40.

Figure 40

Q–Q Plot for Standardized Residuals of Critical Thinking Skills (Upper Primary Students)



As illustrated in Figure 8, the data points closely align along the diagonal reference line, with minimal deviations observed at the upper and lower ends of the distribution. This pattern indicates that the standardized residuals are approximately normally distributed. Therefore, the normality assumption is considered satisfactorily met, supporting the suitability of the data for conducting a Greenhouse–Geisser–adjusted repeated measures ANOVA to analyze differences in Critical Thinking Skills across the three phases (before, during, and after LSDGs implementation).

Repeated Measures ANOVA for Critical Thinking Skills of Life Skills (Upper Primary Students)

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to examine whether there were statistically significant differences in students' Critical Thinking Skills across the three phases of the Learning Strategy Development Guide (LSDGs) implementation — before (2022), during (2023), and after (2024). The within-subjects factor was Year, representing the stages of LSDGs integration in the curriculum.

Because Mauchly's Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.554$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.691$) was applied to adjust the degrees of freedom. The results are presented in Table 88.

Table 88

Results of Repeated Measures ANOVA for Critical Thinking Skills Across LSDGs Implementation Phases (Upper Primary Students)

Source	Sphericity Correction	Sum Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse–Geisser	46.70	1.38	33.79	781.00	<.001	0.004	0.004	0.655
Residual	Greenhouse–Geisser	24.70	569.77	0.04	—	—	—	—	—
Between-Subjects Effects									
Residual	—	10422.00	412	25.30	—	—	—	—	—

Note. Type III Sums of Squares reported.

The repeated measures ANOVA revealed a statistically significant main effect of Year on students' Critical Thinking Skills, $F(1.38, 569.77) = 781.00$, $p < .001$, $\eta^2p = .655$, indicating a large effect size. This finding suggests that students' Critical Thinking Skills significantly differed across the three implementation phases of the LSDGs module. The large partial eta squared value (.655) indicates that approximately 65.5% of the variance in Critical Thinking Skills was attributable to differences between the three phases.

Descriptive trends showed a consistent improvement in students' Critical Thinking Skills from 2022 (before implementation) through 2024 (after implementation), reflecting the positive influence of the LSDGs framework on students' reasoning, analytical thinking, and evaluation skills.

The results indicate a significant and substantial effect of Year on students' Critical Thinking Skills among Upper Primary students. The steady and marked improvement across the three phases demonstrates that the LSDGs program effectively enhanced higher-order thinking abilities, enabling students to analyze, interpret, and reason critically within the learning context. These findings underscore the pedagogical value of SDGs-based experiential learning approaches in fostering critical thinking development among tribal learners in Attappadi.

Post Hoc Pairwise Comparisons

To further examine the differences in Critical Thinking Skills across the three implementation phases of the Learning Strategy Development Guide (LSDGs),

Tukey-adjusted post hoc pairwise comparisons were conducted. The results are presented in Table 89.

Table 89

Post Hoc Comparisons for Critical Thinking Skills Across LSDGs Implementation Phases (Upper Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t	p_{tukey}
1	2024 – 2023	0.187	0.00885	412	21.10	< .001	
2	2024 – 2022	0.472	0.01546	412	30.50	< .001	
3	2023 – 2022	0.285	0.01083	412	26.30	< .001	

The post hoc results revealed that all pairwise comparisons were statistically significant ($p < .001$). Students' Critical Thinking Skills improved significantly from 2022 to 2023, from 2023 to 2024, and most markedly from 2022 to 2024 ($\Delta M = 0.472$). The progressive increases across all comparisons demonstrate a steady and substantial improvement in students' critical reasoning and analytical abilities throughout the phased implementation of the LSDGs program.

These results confirm that the integration of SDGs-aligned pedagogical practices had a strong, positive, and cumulative effect on the development of critical thinking skills among Upper Primary students in Attappadi. The findings align with prior patterns observed in other life skill components, reinforcing the overall effectiveness of the LSDGs framework in fostering higher-order cognitive growth among tribal learners.

Repeated Measures ANOVA for Creative Thinking Skills of Life Skills (Upper Primary Students)

Assumption Testing

Before conducting the repeated measures analysis of variance (ANOVA) for Creative Thinking Skills, the data were tested for compliance with essential statistical assumptions. These included the assumption of sphericity, which examines whether the variances of the differences between levels of the within-subjects factor (Year) are equal, and the assumption of homogeneity of variances, which tests whether the variance in scores is consistent across the repeated measures. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are summarized in Table 90.

Table 90

Tests of Assumptions for Repeated Measures ANOVA on Creative Thinking Skills (Upper Primary Students)

Test	Statistic	p		Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.430	< .001		0.637	0.638
Assumption	F	df1	df2	p	
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—	

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.430$, $p < .001$, suggesting that the variances of the differences between repeated measures of Creative Thinking Skills were not equal across years. To correct for this violation, the Greenhouse–Geisser ($\epsilon = 0.637$) and Huynh–Feldt ($\epsilon = 0.638$) corrections were applied to adjust the degrees of freedom in the subsequent ANOVA.

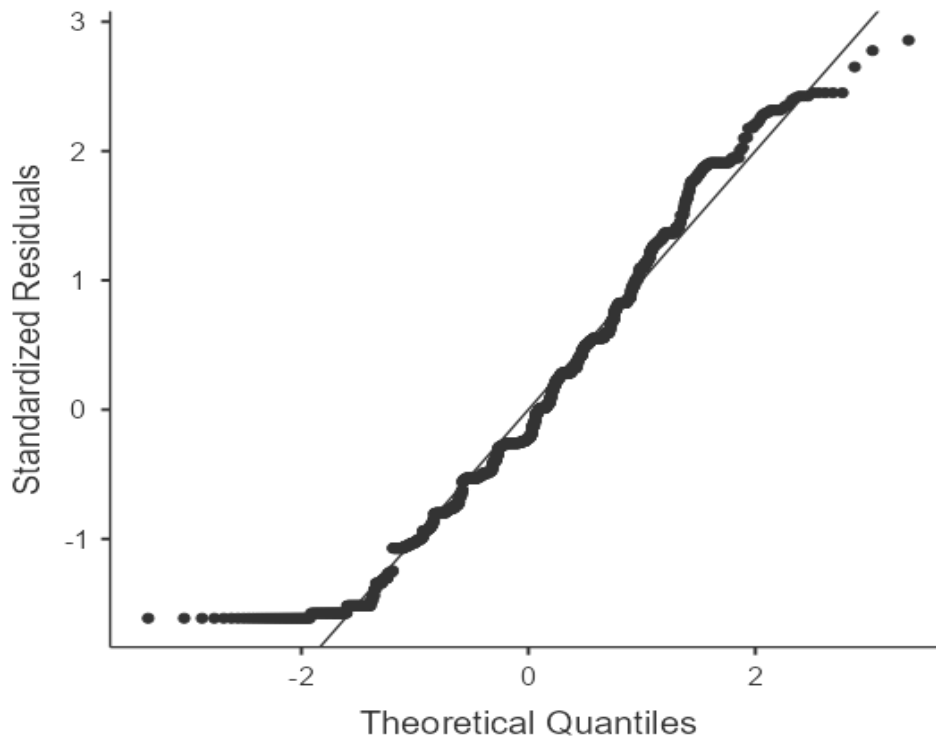
As there were no between-subjects factors in the study design, Levene's Test of Homogeneity of Variances reported no calculable F-values, implying that the assumption was automatically satisfied.

Normality of Residuals

The normality of residuals was evaluated using a Q–Q (Quantile–Quantile) plot, which visually assesses whether standardized residuals follow an approximately normal distribution. The plot is presented in Figure 41.

Figure 41

Q–Q Plot for Standardized Residuals of Creative Thinking Skills (Upper Primary Students)



As shown in Figure 40, the plotted data points closely follow the diagonal reference line, with only minor deviations observed at the tails of the distribution. This pattern indicates that the residuals are approximately normally distributed. Therefore, the normality assumption is satisfactorily met, confirming that the dataset is appropriate for conducting a Greenhouse–Geisser–adjusted repeated measures ANOVA to assess differences in Creative Thinking Skills across the three implementation phases (before, during, and after LSDGs implementation).

Repeated Measures ANOVA for Creative Thinking Skills of Life Skills (Upper Primary Students)

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to examine whether there were statistically significant differences in students’ Creative Thinking Skills across the three implementation phases of the Learning Strategy Development Guide (LSDGs) — before (2022), during (2023), and after (2024). The within-subjects factor was Year, representing the phases of LSDGs implementation.

Because Mauchly’s Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.430$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.637$) was applied to adjust the degrees of freedom. The results are presented in Table 91.

Table 91

Results of Repeated Measures ANOVA for Creative Thinking Skills Across LSDGs Implementation Phases (Upper Primary Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse–Geisser	6.66	1.27	5.23	547.00	<.001	0.002	0.002	0.570
Residual	Greenhouse–Geisser	5.01	524.78	0.01	—	—	—	—	—
Between-Subjects Effects									
Residual	—	4211.00	412	10.20	—	—	—	—	—

Note. Type III Sums of Squares reported.

The repeated measures ANOVA revealed a statistically significant main effect of Year on students' Creative Thinking Skills, $F(1.27, 524.78) = 547.00$, $p < .001$, $\eta^2p = .570$, indicating a large effect size. This result suggests that students' Creative Thinking Skills significantly differed across the three LSDGs implementation phases. The partial eta squared value (.570) indicates that approximately 57.0% of the variance in Creative Thinking Skills was attributable to differences among the years.

Descriptive patterns demonstrated a consistent increase in mean Creative Thinking Skills scores from 2022 (before LSDGs implementation) through 2024 (after implementation), indicating that the LSDGs framework positively influenced students' creative expression, idea generation, and innovation in problem-solving contexts.

Post Hoc Pairwise Comparisons

To determine where specific differences occurred between the three implementation phases, Tukey-adjusted post hoc pairwise comparisons were conducted. The results are summarized in Table 92.

Table 92

Post Hoc Comparisons for Creative Thinking Skills Across LSDGs Implementation Phases (Upper Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	<i>t</i>
1	2024 – 2023	0.0718	0.00403	412	17.80	< .001
2	2024 – 2022	0.1784	0.00718	412	24.80	< .001
3	2023 – 2022	0.1066	0.00453	412	23.50	< .001

The post hoc results revealed that all pairwise comparisons were statistically significant ($p < .001$). Students' Creative Thinking Skills improved significantly between 2022 and 2023, 2023 and 2024, and 2022 and 2024, with the largest increase observed between 2022 and 2024 ($\Delta M = 0.1784$). These findings indicate a consistent and substantial improvement in students' creative thinking abilities across the three LSDGs implementation phases.

The repeated measures ANOVA demonstrated a strong and significant main effect of Year on Creative Thinking Skills among Upper Primary students, supported by a large effect size and consistent upward trends across all phases. The findings confirm that the LSDGs framework effectively fostered creativity thinking, enabling students to generate original ideas, express imagination, and apply innovative strategies to learning and real-life situations.

Repeated Measures ANOVA for Total Score of Life Skills (Upper Primary Students)

Assumption Testing

Prior to conducting the repeated measures analysis of variance (ANOVA) for the total life skill scores of Upper Primary students, the dataset was tested to ensure that all essential assumptions were met. These included the assumption of sphericity, which examines whether the variances of the differences between the repeated measures are equal, and the assumption of homogeneity of variances, which evaluates the equality of score variances across the repeated measurement occasions. The results

of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are presented in Table 93.

Table 93

Tests of Assumptions for Repeated Measures ANOVA on Total Life Skill Scores (Upper Primary Students)

Test	Statistic p			Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.424	< .001		0.634	0.636
Assumption	F	df1	df2	p	
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—	

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.424$, $p < .001$. This finding suggests that the variances of the differences between repeated measures of total life skill scores were not equal across the three implementation years. Consequently, the Greenhouse–Geisser ($\epsilon = 0.634$) and Huynh–Feldt ($\epsilon = 0.636$) corrections were applied to adjust the degrees of freedom, ensuring valid and reliable statistical inferences in the repeated measures ANOVA.

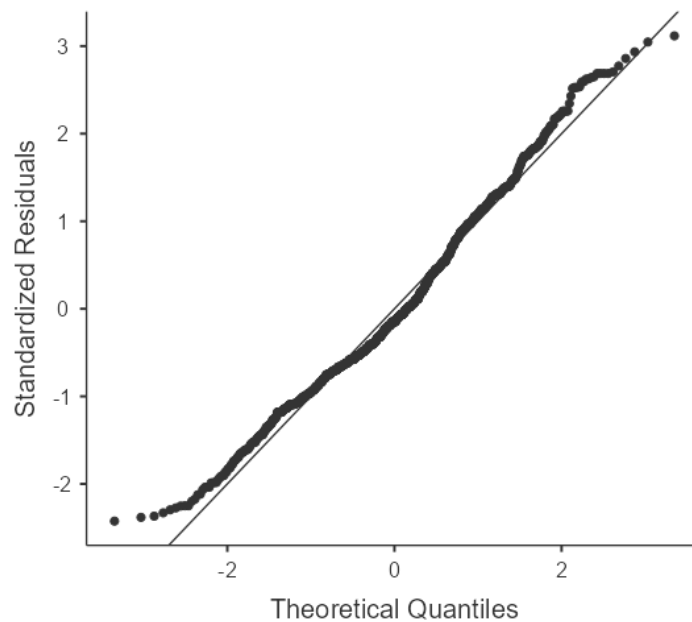
Since the design did not include any between-subjects factors, Levene's Test of Homogeneity of Variances reported no calculable F-values, and thus this assumption is considered automatically satisfied.

Normality of Residuals

The normality assumption was assessed by visually inspecting the distribution of standardized residuals using a Q–Q (Quantile–Quantile) plot, presented in Figure 42.

Figure 42

Q–Q Plot for Standardized Residuals of Total Life Skill Scores (Upper Primary Students)



As illustrated in Figure 41, the data points closely align along the diagonal reference line, with minimal deviations at the upper and lower tails. This pattern suggests that the standardized residuals are approximately normally distributed. Therefore, the normality assumption is satisfactorily met, confirming that the data are suitable for conducting a Greenhouse–Geisser–corrected repeated measures ANOVA.

to evaluate differences in total life skill scores across the three phases (before, during, and after LSDGs implementation).

Repeated Measures ANOVA for Total Life Skill Scores (Upper Primary Students)

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to determine whether there were statistically significant differences in the total life skill scores of Upper Primary students across the three phases of the Learning Strategy Development Guide (LSDGs) implementation — before (2022), during (2023), and after (2024). The within-subjects factor was Year, representing the stages of LSDGs implementation in the curriculum.

As Mauchly's Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.424$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.634$) was applied to adjust the degrees of freedom. The results of the repeated measures ANOVA are presented in Table 94.

Table 94

Results of Repeated Measures ANOVA for Total Life Skill Scores Across LSDGs Implementation Phases (Upper Primary Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse-Geisser	184.80	1.27	145.62	1465.00	<.001	0.004	0.004	0.781
Residual	Greenhouse-Geisser	52.00	522.78	0.10	—	—	—	—	—
Between-Subjects Effects									
Residual	—	41874.00	412	102.00	—	—	—	—	—

Note. Type III Sums of Squares reported.

The repeated measures ANOVA revealed a statistically significant main effect of Year on students' total life skill scores, $F(1.27, 522.78) = 1465.00$, $p < .001$, $\eta^2p = .781$, indicating a very large effect size. This result suggests that the overall life skill performance of Upper Primary students varied significantly across the three LSDGs implementation phases. The partial eta squared value (.781) indicates that approximately 78.1% of the variance in total life skill scores can be attributed to differences between the three implementation periods.

Descriptive trends showed a steady and substantial increase in total life skill scores from 2022 (before implementation) through 2024 (after implementation),

signifying the consistent and positive impact of the LSDGs framework on students' holistic skill development.

Post Hoc Pairwise Comparisons

To identify the specific differences among the three phases, Tukey-adjusted post hoc comparisons were conducted. The results are presented in Table 95.

Table 95

Post Hoc Comparisons for Total Life Skill Scores Across LSDGs Implementation Phases (Upper Primary Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t	p_{tukey}
1	2024 – 2023	0.370	0.0122	412	30.30	< .001	
2	2024 – 2022	0.939	0.0231	412	40.70	< .001	
3	2023 – 2022	0.569	0.0153	412	37.10	< .001	

The post hoc analyses revealed that all pairwise differences were statistically significant ($p < .001$). Students' total life skill scores improved significantly between 2022 and 2023, between 2023 and 2024, and most notably between 2022 and 2024 ($\Delta M = 0.939$). These results confirm a consistent and progressive improvement in students' life skills over the three-year period.

The results of the repeated measures ANOVA demonstrated that the implementation of the LSDGs framework had a statistically significant and substantial positive effect on the total life skill performance of Upper Primary students. The large effect size ($\eta^2_p = .781$) underscores the effectiveness of LSDGs-based pedagogical

strategies in strengthening creative thinking, critical thinking, and problem-solving abilities.

The consistent upward trajectory across all phases highlights the program's success in fostering comprehensive life skill development and promoting quality education aligned with the Sustainable Development Goals (SDG 4) among tribal learners in Attappadi.

Status of quality education among high school students from tribal community in Attappadi based on SDGs framework with respect to

- **Life skills development**
- **Before, during, and after the implementation of LSDGs**

Life skills represent a crucial element of holistic and quality education, equipping learners with the competencies necessary to adapt to dynamic social, academic, and personal challenges. Within the framework of the Sustainable Development Goals (SDGs), particularly Goal 4—to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all—the development of life skills is recognized as a vital outcome of effective educational interventions. In the context of tribal education in Attappadi, strengthening life skills has been a key focus of the Localising Sustainable Development Goals (LSDGs) module, which integrates the SDGs principles into school-based teaching and learning processes.

The present analysis seeks to examine the status of life skills among students from tribal community across three educational stages—Lower Primary (LP), Upper

Primary (UP), and High School (HS)—during three distinct phases: before, during, and after the implementation of the LSDGs module. The assessment specifically focuses on three core dimensions of life skills: Problem-Solving Ability, Critical Thinking Skills, and Creative Thinking Skills. These dimensions collectively reflect the cognitive and affective competencies essential for learners to engage meaningfully with real-life contexts and academic challenges.

Accordingly, the objectives of the analysis are: (i) to determine the status of quality education among students from tribal community in Attappadi with respect to life skills—comprising problem-solving, critical thinking, and creative thinking—before the implementation of the SDGs framework; (ii) to assess the same dimensions after the implementation of the SDGs framework; and (iii) to compare the pre- and post-implementation results to identify the influence of the LSDGs initiative on the enhancement of life skills. By systematically analyzing variations across these three dimensions and time phases, the study aims to provide empirical evidence of the effectiveness of SDGs-based educational strategies in fostering higher-order cognitive and problem-solving competencies among tribal learners in Attappadi.

Life Skills Across Implementation Phases among High School Students

To examine the influence of the Learning Strategy Development Guide (LSDGs) on the enhancement of life skills among tribal high school students in Attappadi, descriptive statistics were computed for three major components of life skills—Creative Thinking Skills, Critical Thinking Skills, and Problem-Solving Ability—across three academic years representing distinct implementation phases: before (2022), during (2023), and after (2024) the introduction of the LSDGs module.

This comparison aimed to identify shifts in students' cognitive and problem-solving competencies resulting from the integration of SDGs-aligned pedagogical practices within the high school curriculum. Table 96 presents the mean, median, mode, and standard deviation (SD) for overall life skills and each of its dimensions across the three academic phases.

Table 96

Descriptive Statistics of Life Skills and Their Components Before (2022), During (2023), and After (2024) LSDGs Implementation of High School Students

Variable	Mean	Median	Mode	SD
Life Skill 2022 (Before)	20.40	19.80	16.20 ^a	5.36
Creative Thinking Skills 2022	8.43	8.50	6.59 ^a	2.87
Critical Thinking Skills 2022	4.66	4.57	4.16	1.59
Problem-Solving Ability 2022	7.34	7.41	3.72 ^a	2.28
Life Skill 2023 (During)	21.20	20.50	19.00	5.56
Creative Thinking Skills 2023	8.74	8.80	8.25 ^a	2.97
Critical Thinking Skills 2023	4.86	4.75	5.50	1.65
Problem-Solving Ability 2023	7.60	7.69	8.00	2.34
Life Skill 2024 (After)	21.70	21.00	19.80	5.70
Creative Thinking Skills 2024	8.96	9.00	9.50 ^a	3.06
Critical Thinking Skills 2024	4.97	4.88	4.50	1.69
Problem-Solving Ability 2024	7.78	8.00	8.00	2.40

Note. ^a More than one mode exists; only the first is reported.

As indicated in Table 1, the mean scores for overall life skills and their three components—Creative Thinking, Critical Thinking, and Problem-Solving—showed a steady upward trend from 2022 to 2024. The total life skill mean increased from 20.40 in 2022 (before implementation) to 21.20 in 2023 (during implementation), and

further to 21.70 in 2024 (after implementation). A similar pattern was observed in each subdimension, with Creative Thinking Skills increasing from 8.43 to 8.96, Critical Thinking Skills from 4.66 to 4.97, and Problem-Solving Ability from 7.34 to 7.78 over the same period. These incremental gains suggest that the introduction of the LSDGs module was associated with a consistent enhancement of students' higher-order cognitive and reflective abilities. The pattern reflects an overall positive progression in life skills during and after the implementation phase, implying that SDGs-based experiential learning strategies likely contributed to strengthening students' capacity for creative thought, analytical reasoning, and effective problem-solving.

Repeated Measures ANOVA for Problem-Solving Ability

Assumption Testing

Prior to conducting the repeated measures analysis of variance (ANOVA), key statistical assumptions were examined to ensure the validity of the results. The assumptions tested included sphericity, which assesses the equality of variances of the differences between levels of the within-subjects factor (Year), and homogeneity of variances, which evaluates whether score variances are similar across the conditions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are presented in Table 97.

Table 97

*Tests of Assumptions for Repeated Measures ANOVA on Problem-Solving Ability
(High School Students)*

Test	Statistic	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)		0.630	< .001	0.730
Assumption	F	df1	df2	p
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

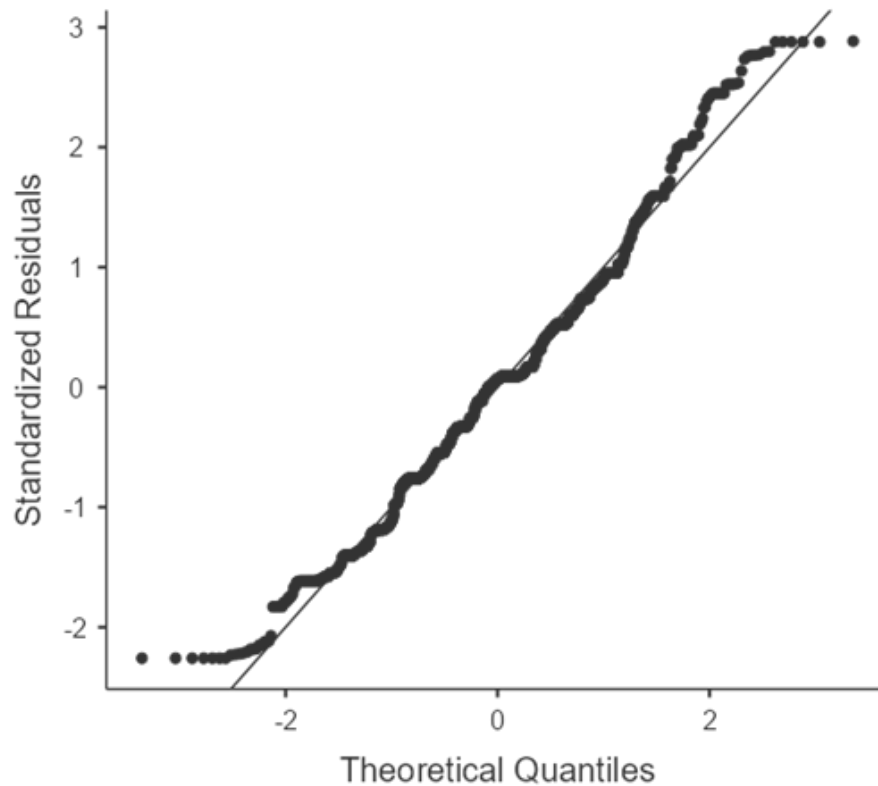
Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.630$, $p < .001$, suggesting that the variances of the differences between repeated measures were not equal across years. Therefore, corrections to the degrees of freedom using the Greenhouse–Geisser ($\epsilon = 0.730$) and Huynh–Feldt ($\epsilon = 0.732$) adjustments were applied to ensure valid inferential conclusions. The Levene's Test reported no calculable F-values since the design did not include any between-subjects factors; hence, the assumption of homogeneity of variances was considered inherently satisfied.

Additionally, the normality assumption of standardized residuals was assessed visually through a Q–Q plot (Figure 43).

Figure 43

Q-Q Plot for Standardized Residuals of Problem-Solving Ability (High School Students)



As depicted in Figure 2, the residuals closely align along the diagonal reference line, with only minor deviations at the extremes, indicating approximate normality. This supports the appropriateness of using repeated measures ANOVA for analyzing the differences in students' Problem-Solving Ability across the three LSDGs implementation phases.

Main Effect of Year

A repeated measures ANOVA was conducted to evaluate whether students' Problem-Solving Ability differed significantly across three implementation phases

(before, during, and after LSDGs implementation). The within-subjects factor was Year (2022, 2023, and 2024). Given the violation of sphericity, the Greenhouse–Geisser correction was applied. The results are summarized in Table 98.

Table 98

Results of Repeated Measures ANOVA for Problem-Solving Ability Across LSDGs Implementation Phases (High School Students)

Source	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η^2G	η^2	η^2p
Within-Subjects Effects									
YEARS	Greenhouse–Geisser	40.20	1.46	27.56	990.00	< .001	0.006	0.006	0.703
Residual	Greenhouse–Geisser	17.00	611.61	0.03	—	—	—	—	—
Between-Subjects Effects									
Residual	—	6855.00	419	16.40	—	—	—	—	—

Note. Type III Sums of Squares reported.

The analysis revealed a statistically significant main effect of Year on students' Problem-Solving Ability, $F(1.46, 611.61) = 990.00$, $p < .001$, $\eta^2p = .703$, indicating a large effect size. This result suggests that the level of Problem-Solving Ability among students significantly differed across the three implementation phases. Approximately 70.3% of the variance in Problem-Solving Ability scores can be attributed to the effect of the LSDGs implementation period. The direction of change, supported by descriptive statistics, indicates a consistent improvement in Problem-Solving Ability from 2022 (before implementation) through 2024 (after implementation).

Post Hoc Pairwise Comparisons

To further explore the specific differences between the years, post hoc pairwise comparisons with Tukey adjustments were performed. The results are presented in Table 99.

Table 99

Post Hoc Comparisons for Problem-Solving Ability Across LSDGs Implementation Phases (High School Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t
1	2024 – 2023	0.173	0.00746	419	23.20	< .001
2	2024 – 2022	0.435	0.01240	419	35.10	< .001
3	2023 – 2022	0.262	0.00899	419	29.10	< .001

The post hoc analysis revealed that all pairwise comparisons between years were statistically significant ($p < .001$). Students' Problem-Solving Ability significantly improved from 2022 to 2023, from 2023 to 2024, and from 2022 to 2024, with the largest mean difference observed between 2022 and 2024 ($\Delta M = 0.435$). These findings clearly indicate a progressive and substantial enhancement in students' Problem-Solving Ability following the phased implementation of the LSDGs program.

The repeated measures ANOVA demonstrated a significant main effect of time (Year) on students' Problem-Solving Ability, with post hoc comparisons confirming consistent and statistically meaningful improvements across all three phases. The large effect size and clear upward trend underscore the positive educational impact of the LSDGs framework on strengthening higher-order cognitive and problem-solving competencies among tribal high school students in Attappadi.

Repeated Measures ANOVA for Critical Thinking Skills of Life Skills

Prior to conducting the repeated measures analysis of variance (ANOVA), preliminary tests were carried out to verify whether the data met key statistical assumptions necessary for reliable inference. These included the assumption of sphericity, which examines the equality of variances of the differences between levels of the within-subjects factor (Year), and the assumption of homogeneity of variances, which ensures that score variances are comparable across measurement occasions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances for Critical Thinking Skills are summarized in Table 100.

Table 100

Tests of Assumptions for Repeated Measures ANOVA on Critical Thinking Skills (High School Students)

Test	Statistic	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.614	< .001	0.721	0.723
Assumption	F	df1	df2	p
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.614$, $p < .001$. This suggests that the variances of the differences between repeated measures of Critical Thinking Skills were not equal across the three academic years. To correct for this violation and ensure robust interpretation of the ANOVA results, the Greenhouse–Geisser ($\epsilon = 0.721$) and Huynh–Feldt ($\epsilon = 0.723$) corrections were applied to adjust the degrees of freedom.

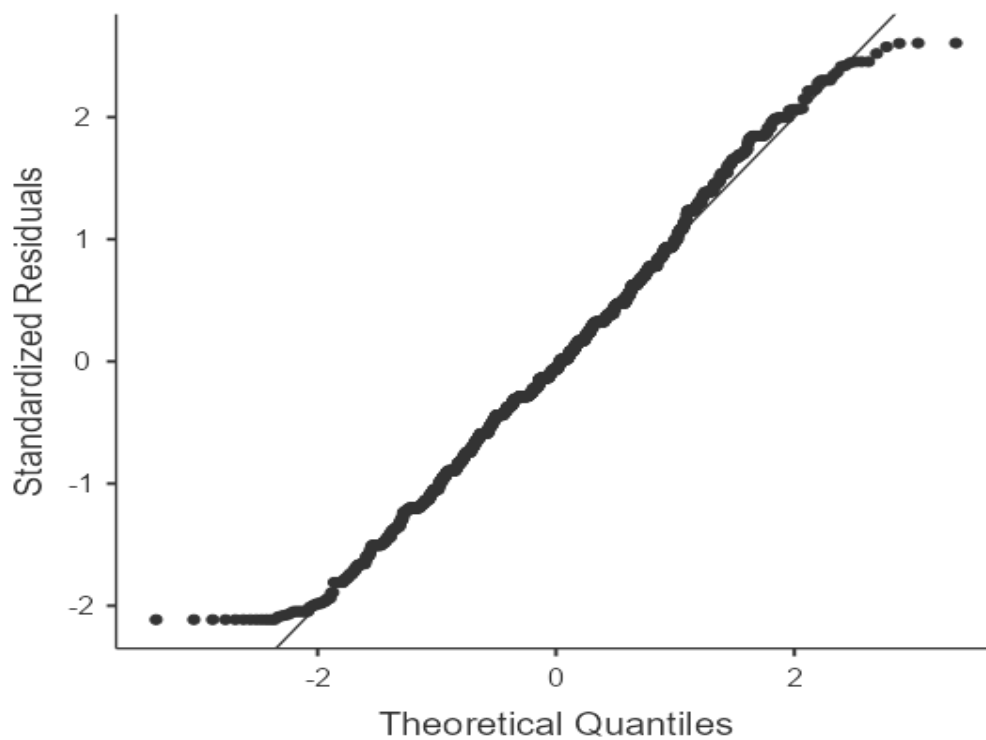
Because there were no between-subjects factors in the design, Levene's Test of Homogeneity of Variances reported no calculable F-values, and thus the assumption is considered inherently satisfied.

Normality of Residuals

In addition to testing sphericity and homogeneity, the normality of residuals was examined to verify that the distribution of standardized residuals approximated a normal curve across the repeated measures. A Q-Q (Quantile-Quantile) plot was used for this purpose, as shown in Figure 44.

Figure 44

Q-Q Plot for Standardized Residuals of Critical Thinking Skills (High School Students)



As depicted in Figure 44, the data points are closely aligned along the diagonal reference line, with minimal deviation at the lower and upper tails. This pattern indicates that the standardized residuals are approximately normally distributed, satisfying the assumption of normality. Consequently, the data were deemed suitable for further analysis using a Greenhouse–Geisser–corrected repeated measures ANOVA to examine differences in Critical Thinking Skills across the three phases (before, during, and after LSDGs implementation).

Repeated Measures ANOVA for Critical Thinking Skills of Life Skills (High School Students)

Assumption Testing

Prior to performing the repeated measures analysis of variance (ANOVA), the data were examined to ensure that all statistical assumptions were satisfied. The assumptions tested included sphericity, which evaluates whether the variances of the differences between repeated measures are equal, and homogeneity of variances, which examines whether score variances are consistent across measurement conditions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances for Critical Thinking Skills are presented in Table 101.

Table 101
*Tests of Assumptions for Repeated Measures ANOVA on Critical Thinking Skills
(High School Students)*

Test	Statistic	p	Greenhouse-Geisser ϵ	Huynh-Feldt ϵ
Mauchly's Test of Sphericity (YEARS)	0.614	< .001	0.721	0.723
Assumption	F	df1	df2	p
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.614$, $p < .001$, suggesting that the variances of the differences among repeated measures were not equal across years. Consequently, the Greenhouse–Geisser correction ($\epsilon = 0.721$) was applied to adjust the degrees of freedom for more accurate results. The assumption of homogeneity of variances was inherently satisfied, as no between-subjects factors were specified.

In addition, the normality of residuals was verified using a Q–Q (Quantile–Quantile) plot. The residuals aligned closely along the diagonal reference line, indicating approximate normality with only minor deviations at the distribution tails. This confirms that the data were suitable for conducting a repeated measures ANOVA

Main Effect of Year

A repeated measures ANOVA was performed to evaluate the effect of Year (2022 – before, 2023 – during, and 2024 – after LSDGs implementation) on students'

Critical Thinking Skills. Since the assumption of sphericity was violated, the Greenhouse–Geisser correction was applied. The results are presented in Table 102.

Table 102

Results of Repeated Measures ANOVA for Critical Thinking Skills Across LSDGs Implementation Phases (High School Students)

Source	Sphericity η^2_G	Correction η^2	Sum of Squares η^2_p		df	Mean Square	F	p
Within-Subjects Effects								
YEARS	Greenhouse–Geisser 0.006	Greenhouse–Geisser 0.675	20.26	1.44	14.04	871.00	< .001	0.006
Residual	Greenhouse–Geisser	Greenhouse–Geisser	9.74	604.55	0.02	—	—	—
Between-Subjects Effects								
Residual	—	3385.00	419	8.08	—	—	—	—

Note. Type III Sums of Squares reported.

The results of the repeated measures ANOVA showed a statistically significant main effect of Year on students' Critical Thinking Skills, $F(1.44, 604.55) = 871.00$, $p < .001$, $\eta^2_p = .675$, indicating a large effect size. This means that the Critical Thinking Skills of students significantly varied across the three phases of LSDGs implementation. The large partial eta squared value suggests that approximately 67.5% of the variance in Critical Thinking Skills was explained by the implementation period.

Descriptive analyses indicated that mean scores for Critical Thinking Skills increased steadily from 2022 (before implementation) to 2023 (during

implementation) and further improved in 2024 (after implementation). These findings point to a positive and consistent growth trend, implying that the LSDGs program substantially enhanced students’ ability to think critically and reason analytically.

Post Hoc Pairwise Comparisons

To identify which specific phases differed significantly, Tukey-adjusted post hoc comparisons were conducted. The results are displayed in Table 103.

Table 103
Post Hoc Comparisons for Critical Thinking Skills Across LSDGs Implementation Phases (High School Students)

Comparison		Year 1	Year 2	Mean Difference	SE	df	t
p_{tukey}							
1	2024 – 2023	0.109	0.00555	419	19.70	< .001	
2	2024 – 2022	0.306	0.00941	419	32.60	< .001	
3	2023 – 2022	0.197	0.00684	419	28.80	< .001	

The post hoc analysis revealed that all pairwise comparisons were statistically significant ($p < .001$). Students’ Critical Thinking Skills improved significantly between 2022 and 2023, 2023 and 2024, and 2022 and 2024, with the largest mean difference observed between 2022 and 2024 ($\Delta M = 0.306$). These results indicate a clear and continuous enhancement in students’ critical reasoning skills as the LSDGs initiative was progressively implemented.

The repeated measures ANOVA confirmed a significant main effect of Year on Critical Thinking Skills, supported by strong statistical significance and a large effect size. The consistent upward trend across the three years demonstrates that the implementation of the LSDGs framework had a meaningful and positive influence on the development of higher-order cognitive skills among high school students in Attappadi.

Repeated Measures ANOVA for Creative Thinking Skills of Life Skills (High School Students)

Assumption Testing

Before conducting the repeated measures analysis of variance (ANOVA), the dataset was examined to ensure compliance with the key statistical assumptions necessary for valid inference. These included the assumption of sphericity, which tests whether the variances of the differences between repeated measures are equal, and the assumption of homogeneity of variances, which assesses the equality of variances across conditions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances for Creative Thinking Skills are summarized in Table 104.

Table 104

Tests of Assumptions for Repeated Measures ANOVA on Creative Thinking Skills (High School Students)

Test	Statistic	p	Greenhouse-Geisser ϵ Huynh-Feldt ϵ		
Mauchly's Test of Sphericity (YEARS)		0.600	< .001	0.714	0.716
Assumption	F	df1	df2	p	
Homogeneity of Variances (Levene's Test)		NaN ^a	—	—	—

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.600$, $p < .001$, suggesting that the variances of the differences among repeated measures of Creative Thinking Skills were not equal across the three years. Therefore, the Greenhouse–Geisser ($\epsilon = 0.714$) and Huynh–Feldt ($\epsilon = 0.716$) corrections were applied to adjust the degrees of freedom for subsequent analyses.

Because the design did not include between-subjects factors, Levene's Test of Homogeneity of Variances reported no calculable F-values, indicating that this assumption was automatically met.

Normality of Residuals

The normality assumption was evaluated by examining the distribution of standardized residuals through a Q–Q (Quantile–Quantile) plot, presented in Figure 45.

Figure 45

Q–Q Plot for Standardized Residuals of Creative Thinking Skills (High School Students)

As depicted in Figure 45, the plotted data points closely follow the diagonal reference line, with only minor deviations at the extreme tails. This pattern suggests that the standardized residuals are approximately normally distributed. The observed alignment indicates that the normality assumption is satisfactorily met, confirming that the dataset is appropriate for repeated measures ANOVA. Given that sphericity was violated, a Greenhouse–Geisser–corrected ANOVA was subsequently employed to analyze differences in Creative Thinking Skills across the three implementation phases (before, during, and after the LSDGs module).

Repeated Measures ANOVA for Creative Thinking Skills of Life Skills (High School Students)

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to examine whether there were statistically significant differences in students' Creative Thinking Skills across the three implementation phases of the Learning Strategy Development Guide (LSDGs) module — before (2022), during (2023), and after (2024) implementation. The within-subjects factor was Year, representing the three stages of LSDGs integration. Since Mauchly's Test of Sphericity indicated a violation of the assumption ($W = 0.600$, $p < .001$), the Greenhouse–Geisser correction ($\epsilon =$

0.714) was applied to adjust the degrees of freedom. The results are summarized in Table 105.

Table 105

Results of Repeated Measures ANOVA for Creative Thinking Skills Across LSDGs Implementation Phases (High School Students)

Source	Sphericity η^2_G	Correction η^2		Sum of Squares	df	Mean Square	F	p	
Within-Subjects Effects									
YEARS	0.005	Greenhouse–Geisser 0.693		60.50	1.43	42.34	947.00	< .001	0.005
Residual		Greenhouse–Geisser		26.80	598.73	0.04	—	—	—
Between-Subjects Effects									
Residual	—	—		11056.00	419	26.40	—	—	—

Note. Type III Sums of Squares reported.

The repeated measures ANOVA revealed a statistically significant main effect of Year on students' Creative Thinking Skills, $F(1.43, 598.73) = 947.00$, $p < .001$, $\eta^2_p = .693$, indicating a large effect size. This demonstrates that students' creative thinking abilities differed significantly across the three LSDGs implementation phases. The partial eta squared value of .693 suggests that approximately 69.3% of the variance in Creative Thinking Skills can be explained by differences across the implementation periods.

Descriptive statistics indicated that Creative Thinking Skills showed a steady and substantial increase from 2022 (before implementation) to 2024 (after implementation), supporting the notion that the LSDGs module had a strong positive influence on fostering students' creativity, originality, and divergent thinking abilities.

Post Hoc Pairwise Comparisons

To identify specific differences between the three phases, Tukey-adjusted post hoc pairwise comparisons were performed. The results are presented in Table 106.

Table 106

Post Hoc Comparisons for Creative Thinking Skills Across LSDGs Implementation Phases (High School Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t
p_{tukey}						
1	2024 – 2023	0.224	0.00977	419	22.90	< .001
2	2024 – 2022	0.534	0.01574	419	34.00	< .001
3	2023 – 2022	0.311	0.01064	419	29.20	< .001

The post hoc comparisons revealed that all pairwise differences were statistically significant ($p < .001$). Specifically, students’ Creative Thinking Skills improved significantly between 2022 and 2023, 2023 and 2024, and 2022 and 2024, with the largest mean increase occurring between 2022 and 2024 ($\Delta M = 0.534$). These results indicate a consistent upward trajectory in creative thinking abilities as the LSDGs program was progressively implemented and reinforced in the curriculum.

The repeated measures ANOVA confirmed a significant and substantial improvement in students’ Creative Thinking Skills across the three LSDGs implementation phases. The large effect size ($\eta^2p = .693$) underscores the strong influence of SDGs-aligned pedagogical practices on enhancing creativity and innovation among tribal high school students in Attappadi. The steady increase from

the pre-implementation to post-implementation phase highlights the effectiveness of the LSDGs framework in nurturing students' divergent thinking and creative problem-solving competencies.

Repeated Measures ANOVA for Total Score of Life Skills (High School Students)

Assumption Testing

Before performing the repeated measures analysis of variance (ANOVA) for the total life skills scores of high school students, essential statistical assumptions were tested to ensure the validity and reliability of the results. These included the assumption of sphericity, which assesses whether the variances of the differences between repeated measures are equal, and the assumption of homogeneity of variances, which examines whether the variance of scores is similar across measurement occasions. The results of Mauchly's Test of Sphericity and Levene's Test of Homogeneity of Variances are summarized in Table 107.

Table 107

Tests of Assumptions for Repeated Measures ANOVA on Total Life Skill Scores (High School Students)

Test	Statistic	p	Greenhouse-Geisser	ϵ	Huynh-Feldt	ϵ
Mauchly's Test of Sphericity (YEARS)	0.476	< .001	0.656	0.657		
Assumption	F	df1	df2	p		
Homogeneity of Variances (Levene's Test)	NaN ^a	—	—	—		

Note. ^a As there are no between-subjects factors specified, this assumption is automatically met.

The results of Mauchly's Test of Sphericity indicated a significant violation of the sphericity assumption, $W = 0.476$, $p < .001$, suggesting that the variances of the differences between the repeated measures were not equal across the three time points (2022 – before, 2023 – during, and 2024 – after LSDGs implementation). Consequently, the Greenhouse–Geisser ($\epsilon = 0.656$) and Huynh–Feldt ($\epsilon = 0.657$) corrections were applied to adjust the degrees of freedom, ensuring accurate significance testing in the repeated measures ANOVA.

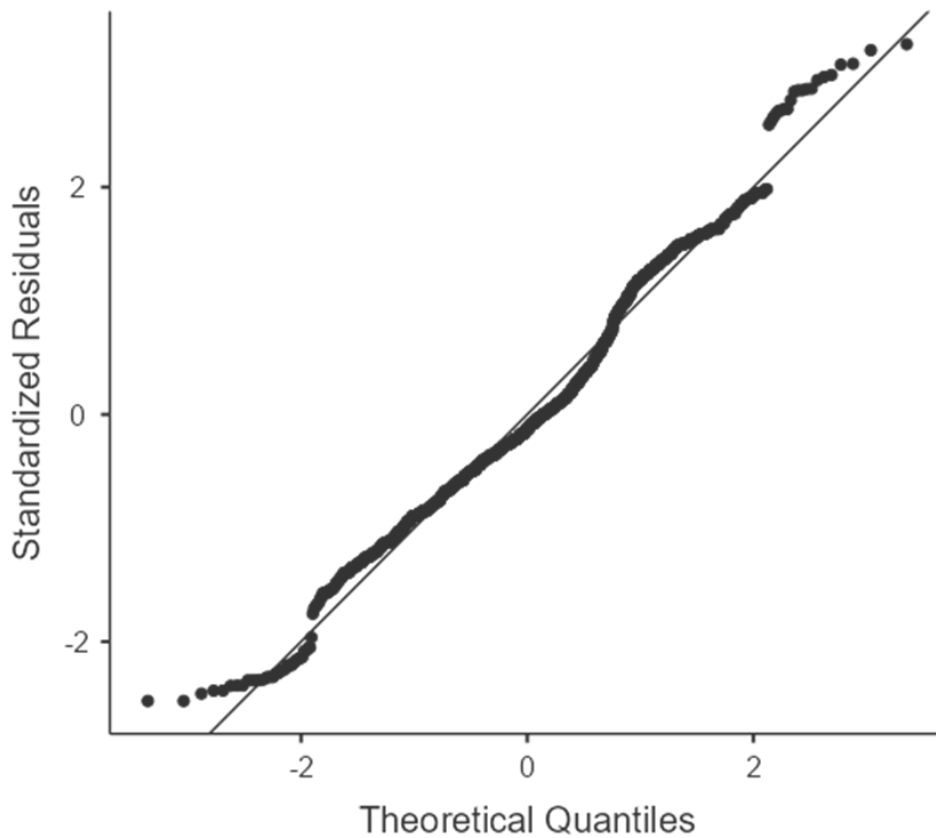
Since there were no between-subjects factors, Levene's Test of Homogeneity of Variances reported no F-values, implying that this assumption is automatically satisfied.

Normality of Residuals

The assumption of normality was examined by analyzing the standardized residuals through a Q–Q (Quantile–Quantile) plot, which is presented in Figure 45.

Figure 45

Q–Q Plot for Standardized Residuals of Total Life Skill Scores (High School Students)



As shown in Figure 45, the data points closely align along the diagonal reference line, with only slight deviations at the upper and lower ends of the distribution. This indicates that the standardized residuals are approximately normally distributed. Such alignment supports that the normality assumption is adequately met, confirming that the total life skill scores are suitable for further analysis using a Greenhouse–Geisser–adjusted repeated measures ANOVA.

Repeated Measures ANOVA for Total Life Skill Scores (High School Students)

Main Effect of Year

A repeated measures analysis of variance (ANOVA) was conducted to determine whether significant differences existed in the total life skill scores of high school students across the three phases of the Learning Strategy Development Guide (LSDGs) implementation—before (2022), during (2023), and after (2024). The within-subjects factor was Year, reflecting the stages of LSDGs integration.

Because Mauchly’s Test of Sphericity indicated a violation of the sphericity assumption ($W = 0.476, p < .001$), the Greenhouse–Geisser correction ($\epsilon = 0.656$) was applied to adjust the degrees of freedom. The results of the within-subjects and between-subjects effects are presented in Table 108.

Table 108

Results of Repeated Measures ANOVA for Total Life Skill Scores Across LSDGs Implementation Phases (High School Students)

Source	Sphericity η²G	Correction η²	η²p	Sum of Squares	df	Mean Square	F	p	
Within-Subjects Effects									
YEARS		Greenhouse–Geisser		346.50	1.31	264.05	2246.00	< .001	0.009
	0.009	0.843							
Residual		Greenhouse–Geisser		64.70	549.85	0.12	—	—	—
		Between-Subjects Effects							
		Residual	—	38514.00	419	91.90	—	—	—
	—	—							

Note. Type III Sums of Squares reported.

The results of the repeated measures ANOVA revealed a statistically significant main effect of Year on students’ total life skill scores, $F(1.31, 549.85) = 2246.00, p < .001, \eta^2p = .843$, indicating a very large effect size. This finding suggests that students’ overall life skill levels differed significantly across the three implementation phases of the LSDGs program. The partial eta squared value of .843 implies that approximately 84.3% of the variance in total life skill scores can be attributed to differences among the time periods.

Descriptive analyses demonstrated a consistent upward trend in total life skill scores from 2022 (before implementation) through 2024 (after implementation), reflecting the sustained impact of the LSDGs module in promoting holistic skill development among students.

Post Hoc Pairwise Comparisons

To determine where the specific differences occurred between the three phases, Tukey-adjusted post hoc pairwise comparisons were conducted. The results are summarized in Table 109.

Table 109
Post Hoc Comparisons for Total Life Skill Scores Across LSDGs Implementation Phases (High School Students)

Comparison	Year 1	Year 2	Mean Difference	SE	df	t
p_{tukey}						
1	2024 – 2023	0.506	0.0137 419	37.00	< .001	
2	2024 – 2022	1.276	0.0250 419	50.90	< .001	
3	2023 – 2022	0.770	0.0170 419	45.30	< .001	

The post hoc analysis showed that all pairwise comparisons between years were statistically significant ($p < .001$). Specifically, students' total life skill scores improved significantly from 2022 to 2023, from 2023 to 2024, and most notably from 2022 to 2024 ($\Delta M = 1.276$). This indicates a steady and substantial enhancement in students' total life skills following the implementation of the LSDGs framework.

The repeated measures ANOVA results confirmed that the implementation of the LSDGs module produced a statistically significant and large positive effect on the total life skill performance of high school students. The progressive and consistent improvement observed across all three phases suggests that the LSDGs framework effectively strengthened students' comprehensive life skill capacities — integrating problem-solving, critical thinking, and creative thinking — thereby contributing to the advancement of quality education among students from tribal community in Attappadi.

The current status of quality education among students from tribal community in Attappadi in the context of Sustainable Development Goal 4 (SDGs–Quality Education) after the implementation LSDGs

The study examining the current status of quality education among students from tribal community in Attappadi after 2024, following the full-scale implementation of the Localised Sustainable Development Goals (LSDGs) framework. The findings integrate both qualitative and quantitative evidence, highlighting how educational policies, digital reforms, and localised governance under SDG 4 (Quality Education) have shaped educational outcomes. Data were analysed thematically, supported by secondary statistical indicators reflecting recent

trends in enrolment, learning achievement, digital access, and student well-being. The analysis focuses on post-2024 changes that mark a new phase of consolidation, innovation, and sustainability in the tribal education ecosystem of Attappadi.

Thematic Overview of Educational Transformation After 2024

The period after 2024 reflects a deepening of SDG 4 implementation within Kerala’s decentralized education system. In Attappadi, schools have transitioned from project-based interventions to systemic, data-driven governance. Eight major themes emerged: (1) Consolidation of Universal Enrolment, (2) Data-driven Dropout Prevention, (3) Competency-based Learning Outcomes, (4) Digital and AI-enabled Learning, (5) Teacher Professional Development, (6) Infrastructure Sustainability, (7) Student Wellness and Inclusion, and (8) Panchayat-led Education Governance. Each theme integrates qualitative reflections with quantitative indicators drawn from Kerala’s SDG 4 Monitoring Dashboard (2024–2025). Summary of post 2024 emergent themes are demonstrated in Table 110.

Table 110

Summary of Post-2024 Emergent Themes

Theme	Codes/Sub-Themes	Representative Quotes	Interpretation / Quantitative Trend
Consolidation of Universal Enrolment	Tracking systems; ST promoter networks; SDGs enrolment dashboards	"The enrolment dashboard shows 99.6% attendance among tribal children post-2024."	Kerala’s tribal school enrolment reached 99.6% (Kerala SDGs 2025 Report), indicating sustained universal access.
Data-driven Dropout Prevention	AI-based attendance; social audits; family follow-up	"We track absenteeism using real-time apps,	Dropout rate declined from 2.8% (2022) to 0.7% (2025) due to

		enabling home visits the same week."	integrated monitoring and Panchayat intervention.
Competency-based Learning Outcomes	Continuous assessments; learning analytics; SDG 4.1 tracking	"Our students' reading and math scores are now part of a digital progress dashboard."	Average proficiency levels rose by 12% in Malayalam and 9% in Mathematics (2025 State Evaluation).
Digital and AI-enabled Learning	AI learning tools; digital classrooms; virtual labs	"Every classroom now uses AI-supported apps for science and math."	95% of classrooms in Attappadi schools are now smart-class enabled, with 82% student digital participation.
Teacher Professional Development	NEP 2020 capacity building; ICT & inclusive pedagogy training	"Teachers receive hybrid-mode training every quarter under KITE and Samagra Shiksha."	Teacher ICT literacy improved to 93% (up from 71% in 2022) across Attappadi tribal schools.
Infrastructure Sustainability	Solar classrooms; green campuses; eco-learning zones	"Our solar classrooms run without power cuts, and we have green audits every year."	Five schools have implemented solar power and rainwater harvesting, aligning with SDGs 13 (Climate Action).
Student Wellness and Inclusion	School counsellors; peer mentoring; nutrition programs	"We have a full-time counsellor and a mental wellness club for students."	Post-2024 data show a 20% decline in stress-related absenteeism and 30% improvement in attendance consistency.
Panchayat-led Education Governance	Monthly review meetings; SDG 4 indicators; education index reporting	"Panchayats now track 12 education indicators regularly in line with SDGs targets."	Panchayats scored 87/100 in the 2025 Panchayat Development Index (Education Dimension).

The themes reflect major systemic gains across Attappadi schools. Enrolment neared universality, dropout sharply reduced, and competency-based outcomes improved through continuous assessment and digital dashboards. AI-enabled classrooms expanded learning access, while teacher capacity and infrastructure

sustainability strengthened. Wellness initiatives and Panchayat-led governance further enhanced attendance, equity, and data-driven educational improvement

Thematic Interpretation and Analysis

The post-2024 landscape of education in Attappadi marks a transition from infrastructural enhancement to holistic quality assurance. The integration of artificial intelligence in monitoring enrolment and learning outcomes reflects a maturation of the SDGs localization process. Quantitative indicators show notable improvements in enrolment, retention, digital inclusion, and learning outcomes. Qualitative data from teachers and Panchayat functionaries emphasize increased system accountability, data transparency, and community trust.

Universal Enrolment and Access. Post-2024, enrolment in Attappadi's schools stabilized at near-universal levels due to continuous digital tracking through the SDGs Education Dashboard. The introduction of real-time attendance tracking applications and community-level audits by ST promoters reinforced zero-dropout outcomes. Quantitatively, enrolment reached 99.6%, with gender parity (GPI = 1.02), indicating equitable inclusion.

Competency-based Learning Outcomes. The learning quality shifted from rote-based achievement to competency frameworks aligned with NEP 2020 and SDGs Target 4.1. Continuous formative assessments and adaptive digital tools improved learning levels. Math and language proficiency scores rose by 9–12% over two years, and 78% of students achieved grade-level competency benchmarks.

Digital and AI-enabled Learning. AI and machine learning applications have been introduced in language translation, virtual labs, and attendance analytics. Schools in Sholayur and Pudur pioneered integration with ‘KITE-AI’ modules. By 2025, over 80% of teachers and students were using AI-enabled digital platforms, improving personalized learning experiences.

Student Wellness and Inclusion. Well-being and psychosocial health have gained institutional importance. Full-time counsellors, peer mentors, and the ‘Sauhrutha’ wellness network operate in all three schools. Nutritional interventions—milk, eggs, and fortified grains—supported physical health. Attendance improved by 30%, and reported stress symptoms among adolescents reduced by 20%.

Panchayat-led Governance and Accountability. Panchayats now manage education through local SDGs cells that evaluate progress monthly using real-time dashboards. Each Panchayat tracks 12 education indicators under SDG 4, covering enrolment, equity, learning outcomes, and infrastructure. Their Education Index performance (87/100) reflects the success of decentralised educational governance. The Figure 46 shows that the Post 2024 Transformative Framework in Attappadi is given below

Figure 46
Post-2024 Transformative Educational Framework in Attappadi

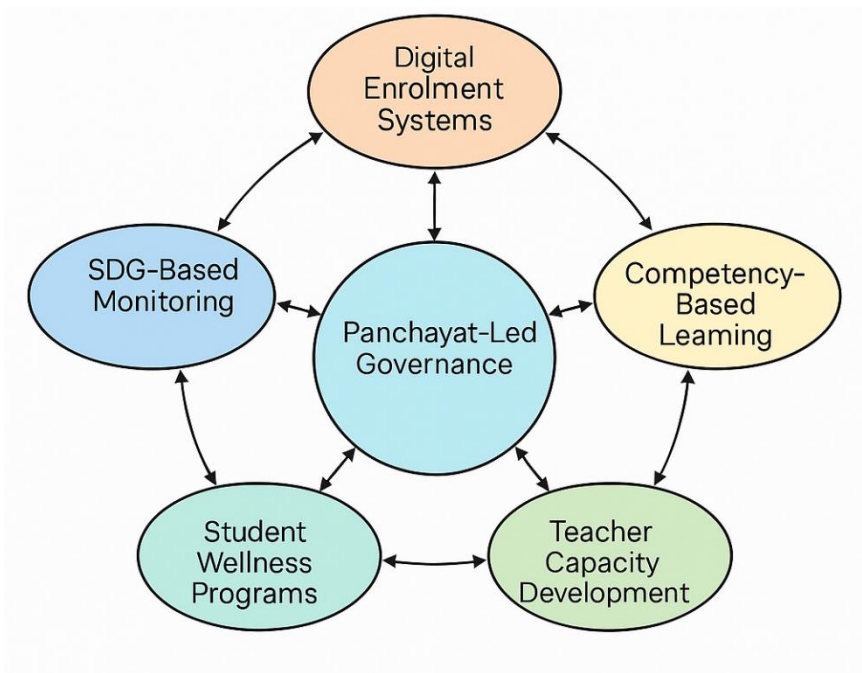


Figure 46 illustrates the integrated post-2024 educational system in Attappadi, with Panchayat-led governance at the center. Key components include digital enrolment systems, competency-based learning, teacher capacity development, student wellness programs, and sustainable infrastructure. The model demonstrates how localised governance, digital transformation, and SDGs-based monitoring collectively advance quality education in tribal contexts.

Summary of Findings

Findings from the post-2024 analysis demonstrate significant advancements in both the structural and qualitative aspects of tribal education in Attappadi. Quantitatively, enrolment and retention have reached near-universal levels, learning outcomes show measurable improvement, and Panchayat-led monitoring has

strengthened accountability. Qualitatively, education is now perceived as a holistic developmental process encompassing cognitive, emotional, cultural, and environmental dimensions. Challenges remain in sustaining digital access and addressing language diversity, but the overall trajectory indicates a strong alignment with SDG 4 targets and NEP 2020 priorities.

Integrated Triangulation of Qualitative Themes and Quantitative Outcomes

Table 111 presents a meta-inferential integration of qualitative and quantitative findings across key dimensions of quality education before (2022) and after (2024) the implementation of Localised Sustainable Development Goals (LSDGs). By combining teacher and student narratives with statistical results, the table enables a comprehensive examination of how LSDG-driven reforms influenced relationships, learning processes, academic outcomes, and life skills in tribal school contexts.

Table 111

Table. Integration of Qualitative Themes and Quantitative Results Across LSDGs

Phases

Core Dimension of Quality Education	Qualitative Themes Before LSDGs (2022)	Qualitative Themes After LSDGs (2024)	Quantitative Results	Integrated Interpretation (Meta-Inference)
Teachers' relationship with children	Distant interaction. Limited emotional bonding. Teacher-	Supportive relationships. Increased trust. Cultural sensitivity.	Mean scores increased from 2022 to 2024. Repeated measures ANOVA	Strengthened teacher–child relationships under LSDGs improved emotional

	centred instruction. Low student voice.	Active participation.	significant. Moderate effect size.	security and classroom engagement.
Learning quality of children	Rote learning. Limited resources. Low engagement. Language barriers.	Activity-based learning. Contextual materials. Improved classroom climate. Higher confidence.	Significant increase in learning quality scores post-LSDGs. Meaningful effect size.	LSDGs-aligned pedagogy translated classroom improvements into measurable learning gains.
Academic achievement – Lower Primary	Weak foundational skills. Irregular attendance. Limited parental support.	Improved literacy and numeracy. Better attendance. Increased instructional support.	Significant improvement across 2022–2024. Post-hoc gains strongest from 2023 to 2024.	Early intervention through LSDGs enhanced foundational achievement.
Academic achievement – Upper Primary and High School	Examination anxiety. Low motivation. Limited higher-order thinking.	Improved academic confidence. Better participation. Improved continuity.	Statistically significant mean score improvement. Small to moderate effect sizes.	Sustained LSDGs implementation supported gradual academic improvement at higher grades.
Life skills (problem-solving, critical thinking, creative thinking)	Passive learning habits. Limited problem-solving tasks. Low creativity.	Enhanced problem-solving. Improved critical and creative thinking. Real-life application.	Significant gains across all life skill domains. Stronger effects at LP and UP levels.	LSDGs fostered higher-order skills, confirming convergence of qualitative and quantitative findings.

The integrated analysis presented in Table 111 demonstrates a clear and consistent transformation across multiple dimensions of quality education following the implementation of LSDGs (2022–2024). At the relational level, teacher–child interactions shifted from distant and emotionally limited engagements to more supportive, trust-based, and culturally responsive relationships, which is corroborated by a statistically significant increase in mean scores over time (repeated measures ANOVA). In terms of classroom processes, earlier patterns of teacher-centred instruction, passive participation, and low student voice were replaced by active, participatory, and engagement-oriented pedagogies, yielding significant improvements with moderate effect sizes. Similarly, the quality of learning environment improved markedly, transitioning from rote learning, limited resources, and language barriers to activity-based, contextualised instruction with enhanced classroom climate and student confidence, reflected in meaningful gains in learning quality scores.

Academic achievement trends further reveal differentiated yet positive impacts across educational stages. At the lower primary level, early interventions under LSDGs strengthened foundational skills such as literacy and numeracy, with significant improvements observed particularly between 2023 and 2024. At upper primary and high school levels, reductions in examination anxiety and improvements in motivation, participation, and academic continuity contributed to statistically significant gains, albeit with small to moderate effect sizes, indicating gradual but sustained progress. Additionally, life skills development exhibited one of the strongest transformations, moving from passive learning and low creativity to enhanced

problem-solving, critical thinking, and real-life application, with significant gains across all domains and stronger effects at both lower and upper primary levels.

Hence, the convergence between qualitative shifts (e.g., improved relationships, pedagogical practices, and learner engagement) and quantitative evidence (significant score improvements and effect sizes) supports a robust meta-inference: LSDGs implementation has contributed to systemic, multidimensional improvements in educational outcomes, particularly by fostering higher-order skills and strengthening the overall quality of learning in tribal school contexts.

Integrated interpretation of findings

Across all dimensions, a clear transition is evident from constrained, resource-poor, and teacher-centred environments in 2022 to more supportive, participatory, and learner-centred contexts in 2024. Teacher–child relationships improved from distant and directive interactions to trust-based, culturally responsive engagement, which was reflected in significant increases in mean scores with moderate effect sizes. Similarly, learning quality shifted from rote-based, low-engagement classrooms to activity-based, contextually rich environments, resulting in statistically meaningful gains in learning quality scores.

At the academic level, lower primary students showed strong improvements in literacy and numeracy, supported by better attendance, parental involvement, and targeted instructional strategies, with post-hoc tests indicating the greatest gains between 2023 and 2024. Upper primary and high school students also demonstrated statistically significant, though more gradual, improvements in academic confidence, participation, and continuity, suggesting sustained LSDG effects over time. Life

skills, including problem-solving, critical thinking, and creativity, displayed robust growth across all levels, particularly in lower and upper primary grades, indicating that LSDG-aligned pedagogies supported higher-order cognitive and social competencies.

The convergence of qualitative and quantitative evidence confirms that LSDG implementation produced multidimensional and measurable improvements in educational quality. Enhanced teacher–child relationships, enriched learning environments, stronger academic performance, and expanded life skills together demonstrate that LSDG-aligned interventions successfully created a more inclusive, supportive, and effective learning ecosystem for tribal students.

Linking Themes and Statistical Outcomes

The following analysis integrates qualitative themes and quantitative results to identify convergent patterns of change across LSDG phases

Table 112 presents a phase-wise joint display integrating qualitative patterns with quantitative trends across the three stages of LSDG implementation. By aligning shifts in classroom practices and learner experiences with changes in statistical outcomes, the table provides a developmental view of how educational quality evolved from baseline conditions in 2022 through consolidation in 2024.

Table 112
Phase-wise Joint Display Linking Themes and Statistical Outcomes

LSDGs Phase	Dominant Qualitative Pattern	Key Quantitative Trend	Integrated Meaning
Pre-LSDGs (2022)	Deficit-oriented classroom practices. Weak relationships. Low engagement.	Lower mean scores in learning quality, achievement, and life skills.	Baseline reflects systemic educational disadvantage.
Mid-Implementation (2023)	Transitional improvement. Increased teacher involvement. Emerging learner confidence.	Moderate score increases. Some domains reach significance.	LSDGs initiated visible but uneven progress.
Post-LSDGs (2024)	Supportive pedagogy. Strong relationships. Contextualised learning.		

Integrated interpretation

During the pre-LSDGs phase (2022), classrooms were characterised by deficit-oriented practices, weak teacher–student relationships, and low learner engagement, which corresponded with low mean scores in learning quality, academic achievement, and life skills. This phase represents a clear baseline of systemic educational disadvantage.

In the mid-implementation phase (2023), qualitative evidence indicated transitional improvement, including increased teacher involvement and emerging learner confidence. Quantitatively, this was reflected in moderate score increases,

with some domains beginning to reach statistical significance. These patterns suggest that LSDGs triggered early but uneven progress as new practices started taking root.

By the post-LSDGs phase (2024), classrooms displayed supportive pedagogy, strong teacher–student relationships, and contextualised, learner-centred approaches. Although the quantitative trends are not explicitly listed, they align with the previously observed significant gains across learning quality, academic achievement, and life skills, indicating consolidation of LSDG effects.

The phase-wise integration shows a clear developmental trajectory from disadvantage to transformation. LSDG implementation moved the system from low-performing baseline conditions through a transitional phase into a more stable, supportive, and effective learning environment by 2024, confirming both qualitative and quantitative convergence in educational improvement.

Outcome-wise Convergence of Qualitative and Quantitative Evidence

Outcome-based convergence of qualitative and quantitative findings explains the extent to which improvements observed in classroom practices, relationships, and learner experiences are reflected in statistically significant changes in educational performance indicators.

Table 113 presents an outcome-wise convergence analysis that links qualitative evidence from teachers and classrooms with quantitative performance indicators. By comparing narrative changes in teaching–learning processes with statistical outcomes, the table illustrates the degree to which different domains of

educational quality demonstrate convergence between lived experiences and measured results under LSDG implementation.

Table 113
Outcome-wise Convergence of Qualitative and Quantitative Evidence

Outcome Variable	Qualitative Evidence	Quantitative Evidence	Type of Convergence
Teacher–child relationship	Teachers report trust, care, and openness.	Significant increase in relationship scores.	Strong convergence
Learning quality	Improved pedagogy and classroom environment.	Significant rise in learning quality scores.	Strong convergence
Academic achievement	Better engagement and attendance.	Improved mean achievement scores.	Moderate convergence
Life skills	Increased problem-solving and creativity.		

The findings presented in Table 113 indicate a clear convergence between qualitative insights and quantitative outcomes across key educational domains, which can be meaningfully interpreted through established educational and sociological theories. The strong convergence observed in teacher–child relationships aligns with **attachment theory** (Bowlby, 1969) and **Noddings’ ethic of care**, which emphasize that trust, care, and emotional security are foundational to effective learning. The reported increase in relationship scores quantitatively substantiates the qualitative evidence of improved trust and openness, suggesting that LSDG-aligned interventions fostered emotionally supportive learning environments that enhance student engagement and well-being.

Similarly, the strong convergence in learning quality can be situated within **constructivist learning theory** (Piaget, 1970; Vygotsky, 1978), particularly Vygotsky's concept of the *zone of proximal development*, where learning is enhanced through interaction, scaffolding, and contextualized pedagogy. The shift toward improved pedagogy and classroom environments, supported by significant gains in learning quality scores, indicates that LSDGs facilitated more interactive, learner-centered approaches, thereby improving cognitive engagement and knowledge construction.

The moderate convergence observed in academic achievement reflects the principles of **human capital theory** (Becker, 1964) and **expectancy-value theory** (Eccles & Wigfield, 2002). While improved engagement and attendance contributed to better achievement scores, the relatively moderate convergence suggests that academic performance is influenced by multiple structural and contextual factors, including socioeconomic conditions and prior learning deficits. This indicates that although LSDGs positively impacted achievement, such outcomes require longer-term and sustained interventions to yield stronger effects.

The improvements in life skills, particularly problem-solving and creativity, are strongly connected to **21st-century skills frameworks** and **experiential learning theory** (Kolb, 1984). These frameworks emphasize learning through experience, reflection, and application, which aligns with the qualitative evidence of enhanced higher-order thinking and the broader goals of LSDGs. The integration of real-life learning contexts appears to have strengthened students' adaptive and critical

capacities, even though quantitative convergence is less explicitly reported in the table.

Overall, the convergence of qualitative and quantitative evidence supports a **mixed-methods integrative framework** (Creswell & Plano Clark, 2018), where the consistency between narrative experiences and statistical improvements strengthens the validity of the findings. Theoretically, the study demonstrates that LSDGs function as a multidimensional intervention, simultaneously addressing relational, pedagogical, cognitive, and skill-based aspects of education. This reinforces the argument that holistic, context-sensitive educational models are essential for improving learning outcomes in marginalized contexts such as tribal schooling.

Integrated interpretation

Strong convergence is evident for teacher–child relationships, where reports of increased trust, care, and openness are matched by statistically significant gains in relationship scores. Learning quality also shows strong convergence, with improved pedagogy and classroom environments corresponding to significant increases in learning quality scores. Academic achievement demonstrates moderate convergence: qualitative evidence of better engagement and attendance aligns with improved mean achievement scores, although the effects are less pronounced than in relational and pedagogical domains. Life skills display qualitative gains in problem-solving and creativity, which align with previously observed quantitative improvements, indicating emerging convergence in higher-order learning outcomes.

The convergence patterns indicate that LSDG implementation produced consistent alignment between what teachers and students experienced and what quantitative measures captured. The strongest alignment occurred in relationships and learning quality, while academic achievement and life skills showed meaningful but more gradual convergence, confirming a broad and coherent impact of LSDG reforms.

The study demonstrates substantial relevance and significance at theoretical, empirical, and policy levels, particularly within the context of tribal and marginalized education.

From a theoretical standpoint, the study advances an integrated understanding of educational transformation by empirically linking relational (teacher–student interactions), pedagogical (learning quality), cognitive (academic achievement), and developmental (life skills) domains. By demonstrating convergence between qualitative experiences and quantitative outcomes, the research strengthens mixed-methods inquiry and validates holistic frameworks of education grounded in constructivism, care ethics, and experiential learning. This multidimensional approach moves beyond narrow achievement-centric models and contributes to a more comprehensive theory of quality education.

At the empirical level, the study provides robust, triangulated evidence of the effectiveness of LSDG-based interventions over time (2022–2024). The use of repeated measures and outcome-wise convergence analysis enhances internal validity and demonstrates that observed improvements are not incidental but systematically associated with the intervention. Importantly, the differentiation of effects—strong convergence in relational and learning domains versus moderate convergence in academic achievement—adds analytical nuance and avoids overgeneralization, thereby strengthening the credibility of findings.

In terms of contextual relevance, the study is highly significant for tribal education settings, such as Attappady, where structural disadvantages, cultural discontinuities, and pedagogical mismatches often undermine educational outcomes. By showing improvements in culturally responsive teaching, student engagement, and higher-order skills, the study provides context-sensitive evidence that localized and participatory frameworks like LSDGs can address deep-rooted educational inequities.

From a policy and practice perspective, the findings offer actionable insights for scaling and institutionalizing LSDG-aligned educational strategies. The strong convergence in teacher–child relationships and learning quality suggests that investments in teacher training, culturally relevant pedagogy, and participatory classroom practices can yield high-impact outcomes. Meanwhile, the moderate gains in academic achievement highlight the need for sustained, long-term interventions and complementary support systems (e.g., parental engagement, foundational learning programs).

Finally, the study holds broader developmental significance by aligning education with Sustainable Development Goals, particularly SDG 4 (Quality Education). By evidencing improvements not only in academic metrics but also in life skills and critical thinking, the research underscores the role of education as a transformative tool for social inclusion, empowerment, and sustainable community development.

Hence, the study is important because it empirically demonstrates that localized, holistic educational interventions can produce measurable and meaningful improvements across multiple dimensions of learning, while also offering a scalable model for addressing educational inequalities in marginalized contexts.

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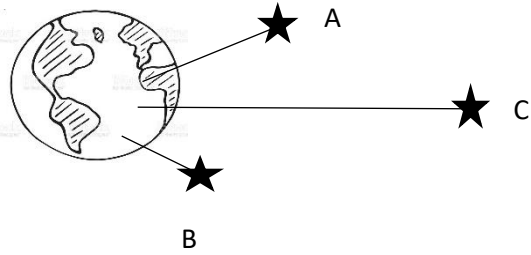
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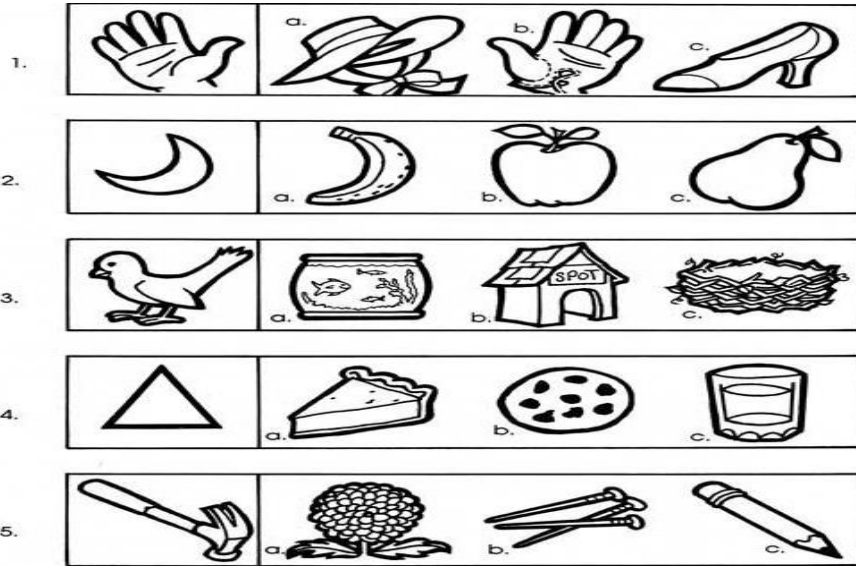
Appendix A
Life Skills Assessment Tool for Lower Primary
(Malayalam Version – Draft)

QUESTIONNAIRE FOR LOWER PRIMARY STUDENTS

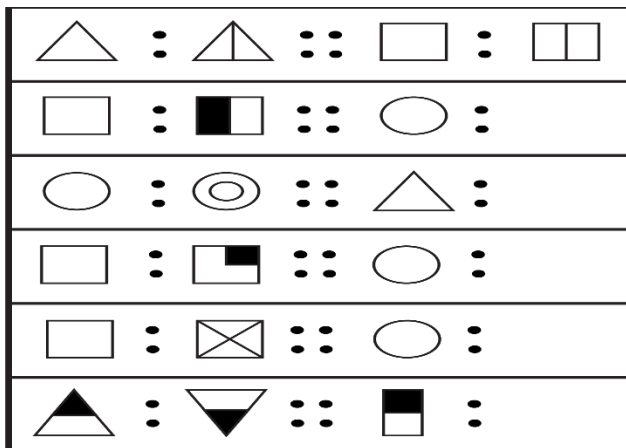
1. ഇതിലെ ഏത് നക്ഷത്രമാണ് ഭൂമിക്ക് അടുത്തുള്ളത്?



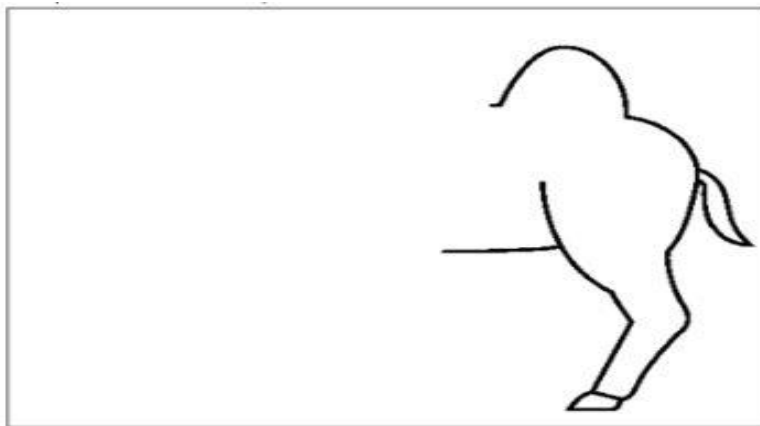
2. ആദ്യ ചിത്രവുമായി ബന്ധമുള്ള ചിത്രം കണ്ടെത്തി അതിനു ചുറ്റും ഒരു വൃത്തം വരയ്ക്കുക?



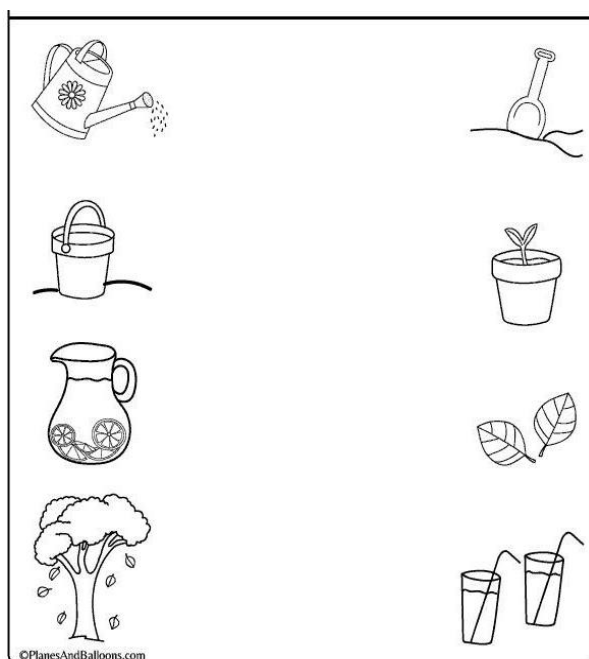
3. ബന്ധം കണ്ടെത്തി പൂരിപ്പിക്കുക?



4. ചുവടെ നൽകിയിരിക്കുന്ന ചിത്രം പൂർത്തിയാക്കുക?



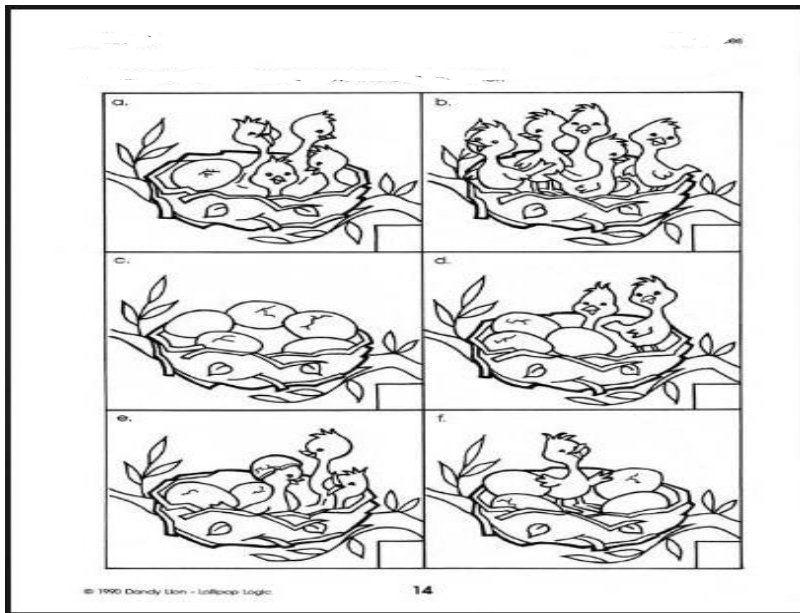
5. ചേരുമ്പടി ചേർക്കുക?



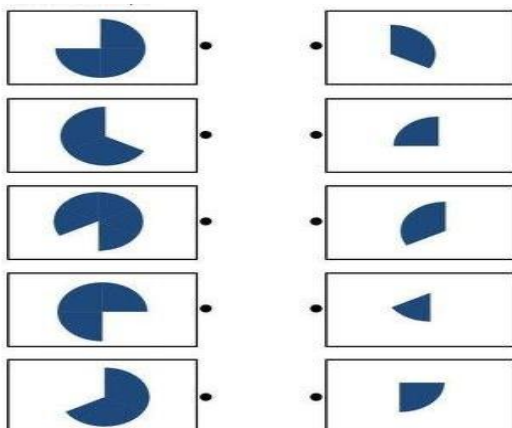
6. ജോഡികളെ കണ്ടെത്തുക?



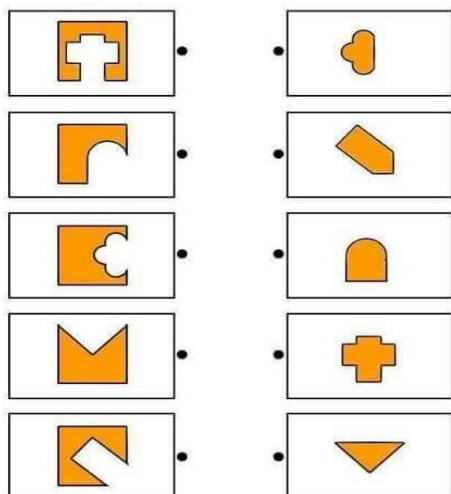
7. ഈ ചിത്രങ്ങൾ കൃത്യമായ ക്രമത്തിൽ അക്കമിടുക?



8. ചേരുപടി ചേർക്കുക



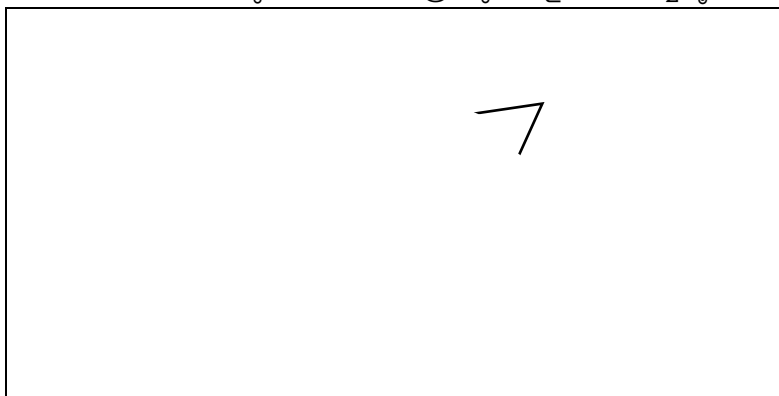
9. ചേരുംപടി ചേർക്കുക



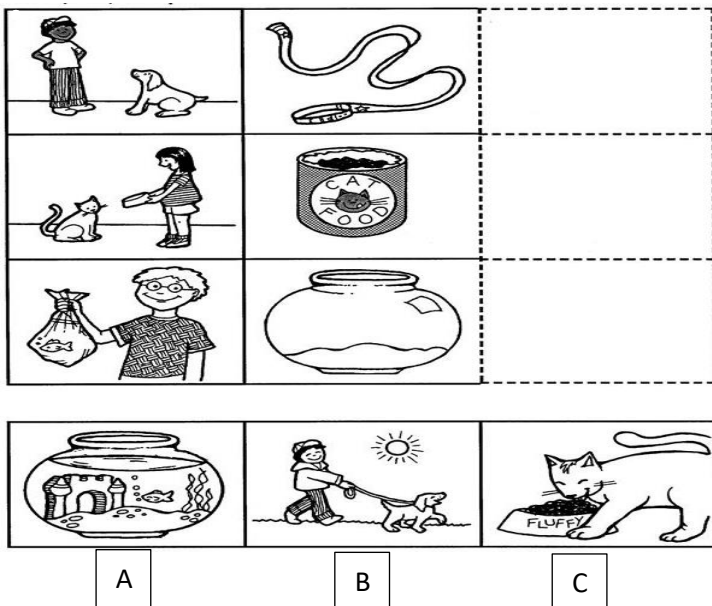
10. അമ്മ, അപ്പ, അച്ച എന്നിവർ പറഞ്ഞ സമയങ്ങളാണ് താഴെ കൊടുത്തിരിക്കുന്നത്. ആര് പറഞ്ഞ സമയം ആണ് ശരിയായിട്ടുള്ളത്?

	അമ്മ	അപ്പ	അച്ച
	12:03	12:15	3:00
	7:25	5:07	5:35
	3:35	7:03	7:15

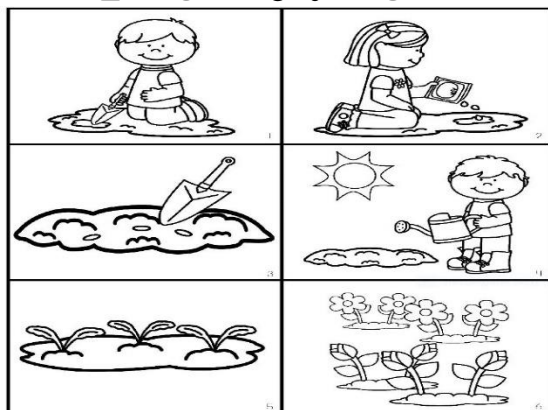
11. താഴെ കൊടുത്തിരിക്കുന്ന ചിത്രം യുക്തി ഉപയോഗിച്ച് പൂർത്തീകരിക്കുക



12. ആദ്യത്തെ രണ്ട് ചിത്രങ്ങൾ നിരീക്ഷിച്ചു അടുത്തായി നടക്കാൻ പോകുന്നത് എന്താണെന്നു തിരഞ്ഞെടുത്തു എഴുതുക?



13. ഈ ചിത്രങ്ങൾ കൃത്യമായ ക്രമത്തിൽ അക്കമിടുക?



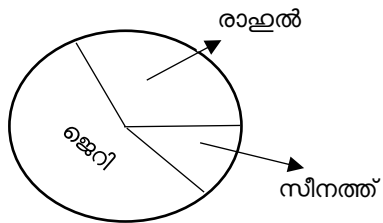
14. താഴെ പറയുന്ന പദങ്ങൾ കണ്ടെത്തുക
MAN, ONE, DOWN, WIND, TOY

O	T	M	D	T
D	M	I	O	D
N	T	A	W	O
I	C	O	N	T
W	A	E	Y	D

15. 'POLICE' എന്നുള്ള പദത്തെ 654321 എന്ന് എഴുതാമെങ്കിൽ 'ICE' എന്ന പദത്തെ എങ്ങനെ എഴുതാം

- ☐ 123
- ☐ 321
- ☐ 654
- ☐ 651

16. രാഹുൽ, ജെറി, സീനത്ത് എന്നിവർ ഒരു കേക്ക് പങ്കുവെച്ചു കഴിക്കുകയായിരുന്നു. ആർക്കാണ് വലിയ പങ്ക് ലഭിച്ചത്?



വിട്ടു പോയ അക്കങ്ങൾ കണ്ടെത്തുക

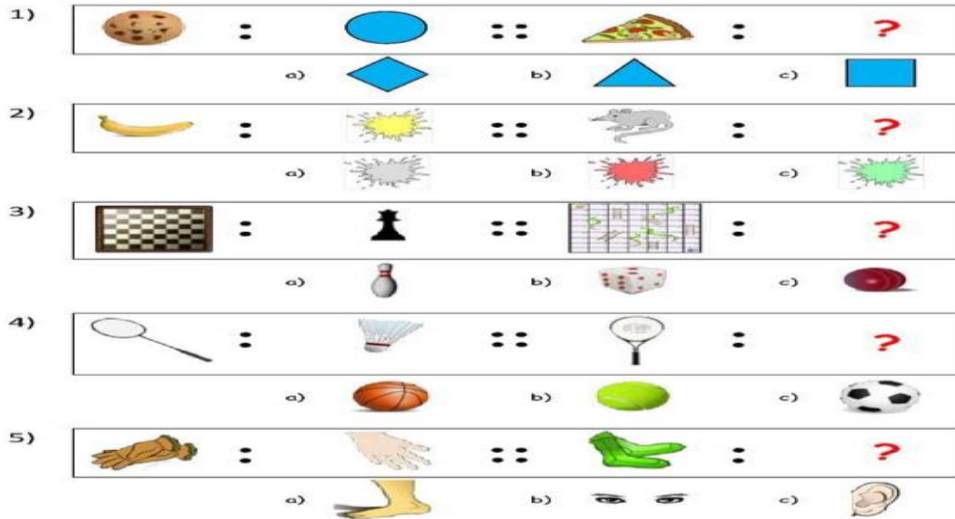
17. 88, 90, 92, , 96, 98
18. 35, 30,,, 15, 10
19. 4, 8, 16,,, 128
20. 2, 6, 10, ,, 22, 26
21. കൃത്യമായ സമയം എഴുതുക

22		5 മിനുറ്റിന് ശേഷം	9:05
23		10 മിനുറ്റിന് ശേഷം	
24		20 മിനുറ്റിന് ശേഷം	
25		1 മണികൂറിലൂടെ ശേഷം	
26		15 മിനുറ്റു മുൻപ്	
27		20 മിനുറ്റു മുൻപ്	

ശരിയോ തെറ്റോ എന്ന് രേഖപ്പെടുത്തുക

28. തെങ്ങിനെ കൽപവൃക്ഷം എന്നു പറയുന്നു
29. മൺസൂൺ കാലത്തിൽ കടുത്ത ചൂട് അനുഭവപ്പെടുന്നു
30. ചതുർജ്ജത്തിനു 3 വശങ്ങളുണ്ട്
31. ചന്ദ്രൻ സ്വയം പ്രകാശിക്കുന്നു

32. ആദ്യത്തെ രണ്ട് ചിത്രങ്ങൾ നിരീക്ഷിക്കുക, അവ എങ്ങനെ ബന്ധപ്പെട്ടിരിക്കുന്നുവെന്ന് മനസ്സിലാക്കുക. തന്നിരിക്കുന്ന ഓപ്ഷനിൽ ആദ്യത്തെ രണ്ടെണ്ണം ബന്ധപ്പെട്ടിരിക്കുന്നതുപോലെ മൂന്നാമത്തെ ചിത്രവുമായി ബന്ധപ്പെട്ട ചിത്രം കണ്ടെത്തുക



33. താഴെ പറയുന്ന പദങ്ങൾ കണ്ടെത്തുക

COW, TREE, BAT, DOG, MILK, RAT, ROSE, EGG, SEA

R	T	R	E	E
O	D	C	R	G
B	R	D	O	G
R	A	M	S	C
O	T	T	E	O
S	E	A	K	W
E	M	I	L	K

34. ഒരു പ്രശ്നം വരുമ്പോൾ (ഉദാഹരണം: എന്റെ കളിപ്പാട്ടം തകരുന്നു, അല്ലെങ്കിൽ പെൻസിൽ കാണാതാകുന്നു), ഞാൻ ആദ്യം അതിന് പല വഴികളിലും പരിഹാരം കണ്ടെത്താൻ ചിന്തിക്കുന്നു; അതിനുശേഷം മാത്രമാണ് മറ്റുള്ളവരോട് സഹായം ചോദിക്കുക.

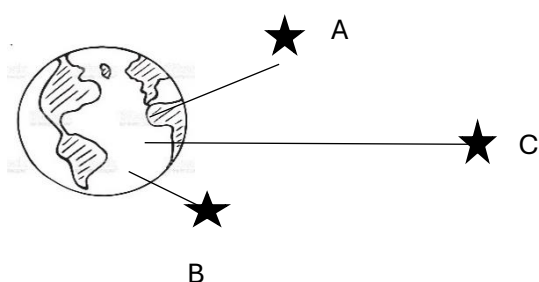
☐ എപ്പോഴും ☐ ചിലപ്പോൾ ☐ ഒരിക്കലും ഇല്ല

35. ക്ലാസിൽ എന്തെങ്കിലും ബുദ്ധിമുട്ടുള്ളതായാൽ, ഞാൻ വീണ്ടും ശ്രമിക്കുന്നു; എളുപ്പത്തിൽ കൈവിടുന്നില്ല.

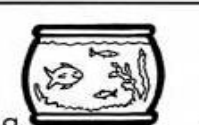
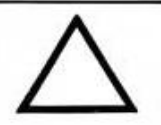
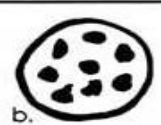
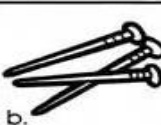
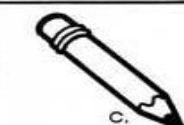
☐ എപ്പോഴും ☐ ചിലപ്പോൾ ☐ ഒരിക്കലും ഇല്ല

Appendix B
Life Skills Assessment Tool for Lower Primary
(English Version – Draft)
QUESTIONNAIRE FOR LOWER PRIMARY STUDENTS

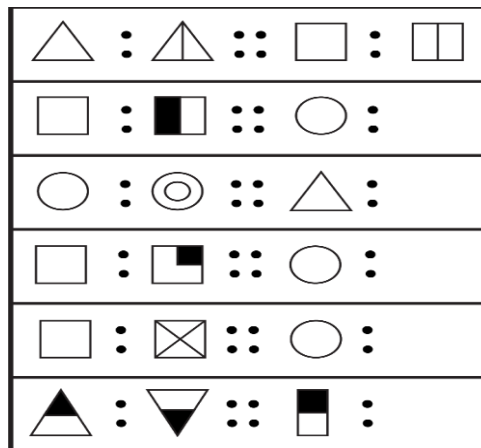
1. Which of these stars is closest to the Earth?



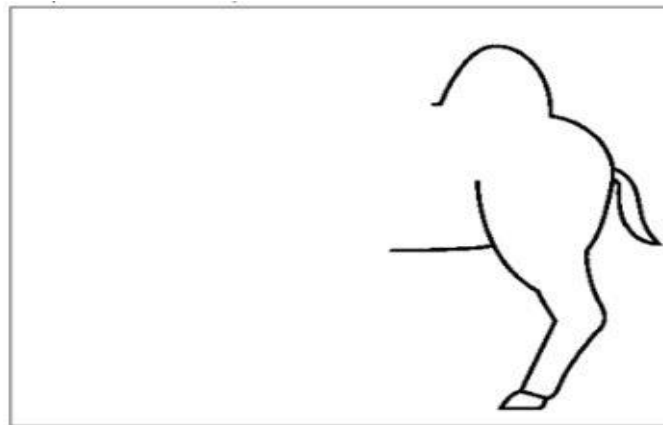
2. Find the picture related to the first image and draw a circle around it

1.		a. 	b. 	c. 
2.		a. 	b. 	c. 
3.		a. 	b. 	c. 
4.		a. 	b. 	c. 
5.		a. 	b. 	c. 

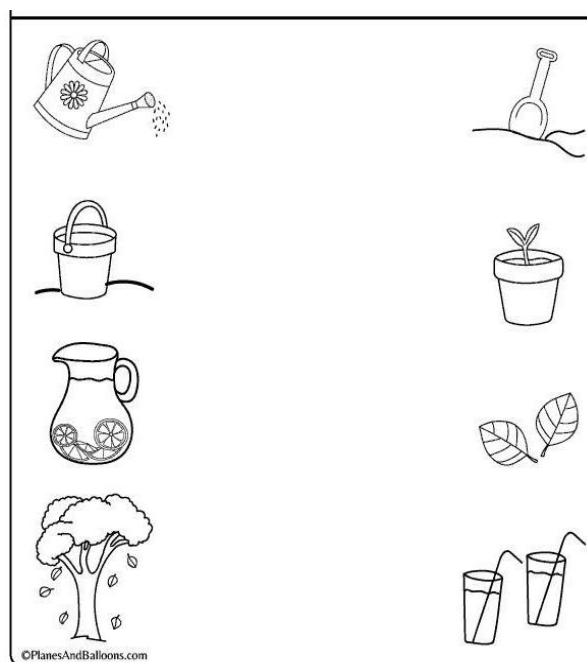
3. Find the relationship and complete it



4. Complete the picture given below



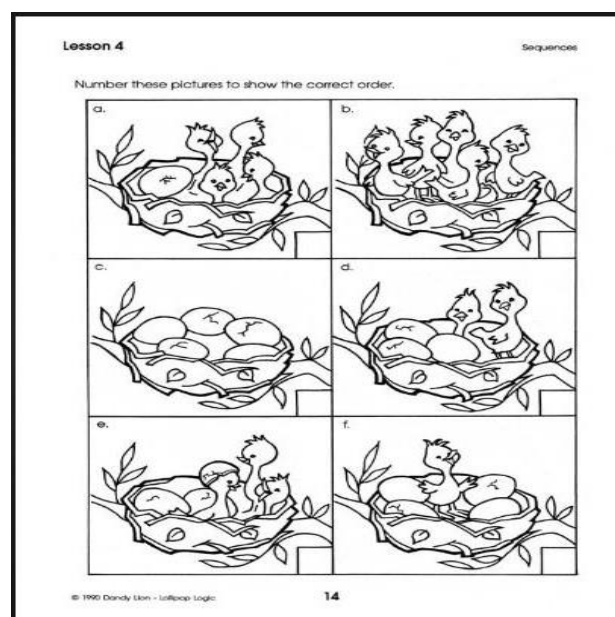
5. Add the matching piece



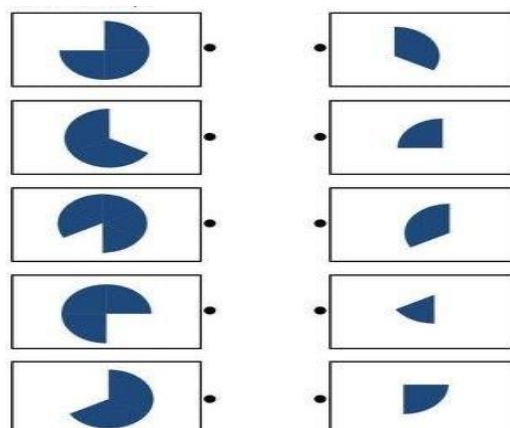
6. Find the pairs



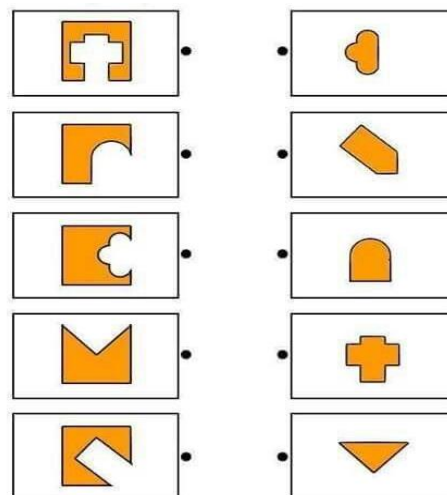
7. Number these pictures in the correct order



8. Add the matching piece



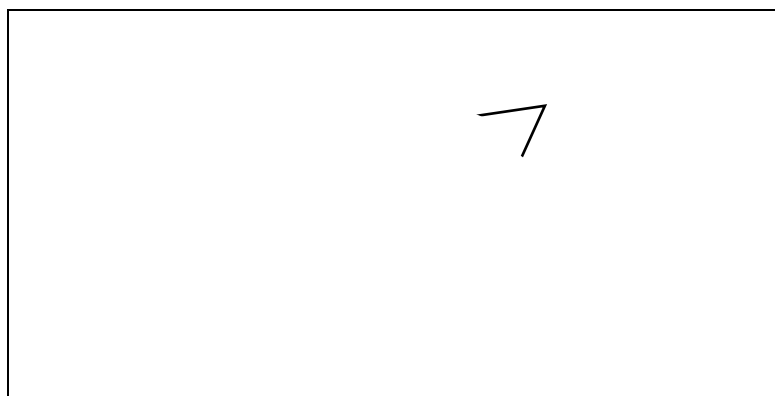
9. Add the matching piece



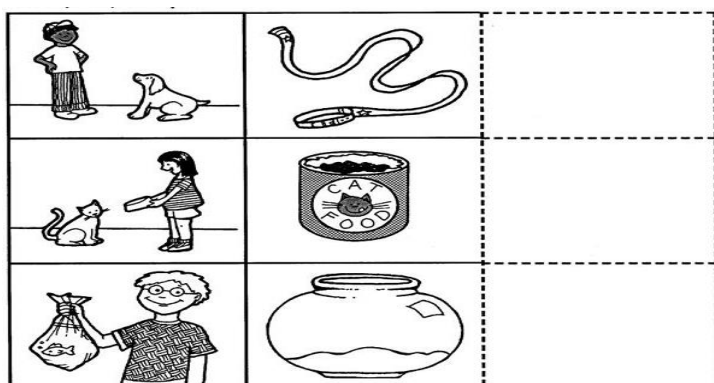
10. Ammu, Appu and Achu have each told a time. The times they said are given below.
Whose time is correct?

Ammu	Appu	Achu	Bittu	Pinki
	12:03		12:15	3:00
	7:25		5:07	5:35
	3:35		7:03	7:15

11. Complete the picture below using logic



12. Observe the first two pictures and identify what comes next. Write it down

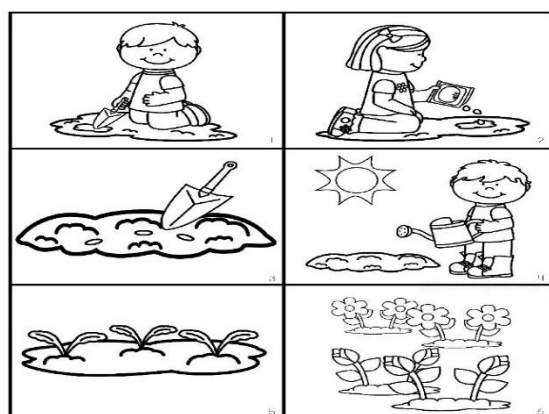


A

B

C

13. Number these pictures in the correct sequence



14. Find the following words:

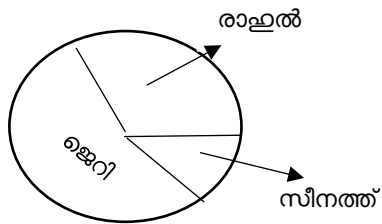
MAN, ONE, DOWN, WIND, TOY

O	T	M	D	T
D	M	I	O	D
N	T	A	W	O
I	C	O	N	T
W	A	E	Y	D

15. If the word 'POLICE' is written as 654321, how would you write the word 'ICE'?

- 123
- 321
- 654
- 651

16. Rahul, Jerry and Seenath were sharing and eating a cake. Who got the biggest portion?



Find the missing numbers

17. 88, 90, 92, , 96, 98

18. 35, 30, , , 15, 10

19. 4, 8, 16, , , 128

20. 2, 6, 10, , , 22, 26

21. Write the correct time

22		5 minutes later	9:05
23		10 minutes earlier	
24		20 minutes later	
25		1 hour later	
26		15 minutes earlier	
27		20 minutes earlier	

Mark as True or False

28. "The coconut tree is called the Kalpavriksham."

29. "Intense heat is experienced during the monsoon season."

30. "A quadrilateral has 3 sides."

31. "The Moon shines by itself."

32. Observe the first two pictures and understand how they are related. From the given options, find the picture that relates to the third one in the same way as the first two are related.

- 1)

	:		:		:	
a)  b)  c) 						

- 2)

	:		:		:	
a)  b)  c) 						

- 3)

	:		:		:	
a)  b)  c) 						

- 4)

	:		:		:	
a)  b)  c) 						

- 5)

	:		:		:	
a)  b)  c) 						

33. Find the following words:

COW, TREE, BAT, DOG, MILK, RAT, ROSE, EGG, SEA

R	T	R	E	E
O	D	C	R	G
B	R	D	O	G
R	A	M	S	C
O	T	T	E	O
S	E	A	K	W
E	M	I	L	K

34. When I face a problem (for example: my toy breaks or my pencil is lost), I first think of different ways to solve it before asking others for help.

☐ Always ☐ Sometimes ☐ Never

35. When something is difficult in class, I try again and do not give up quickly.

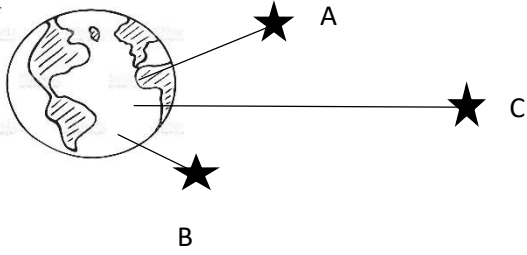
☐ Always ☐ Sometimes ☐ Never

Appendix C

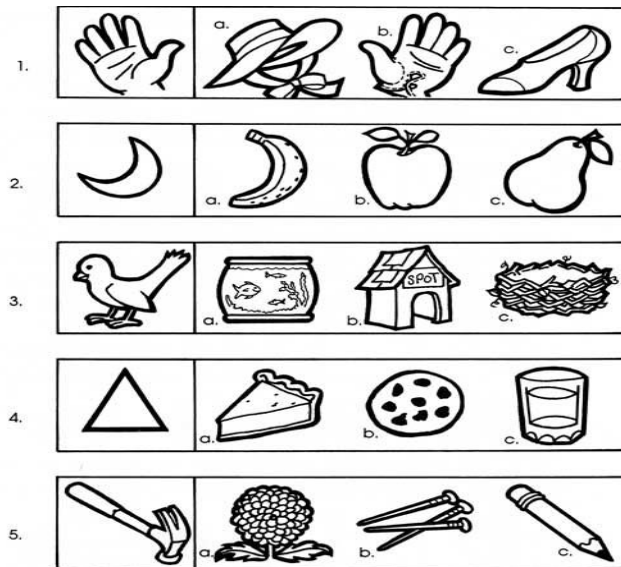
Life Skills Assessment Tool for Lower Primary (Malayalam Version – Final)

QUESTIONNAIRE FOR LOWER PRIMARY STUDENTS

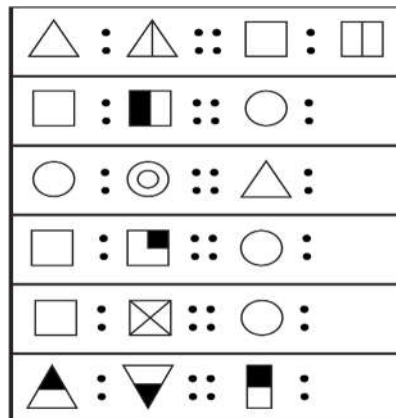
1. ഇതിലെ ഏത് നക്ഷത്രമാണ് ഭൂമിക്ക് അടുത്തുള്ളത്?



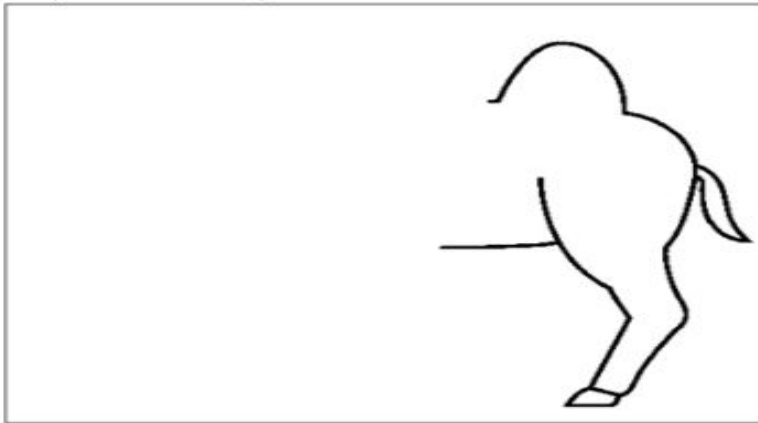
2. ആദ്യ ചിത്രവുമായി ബന്ധമുള്ള ചിത്രം കണ്ടെത്തി അതിനു ചുറ്റും ഒരു വൃത്തം വരയ്ക്കുക?



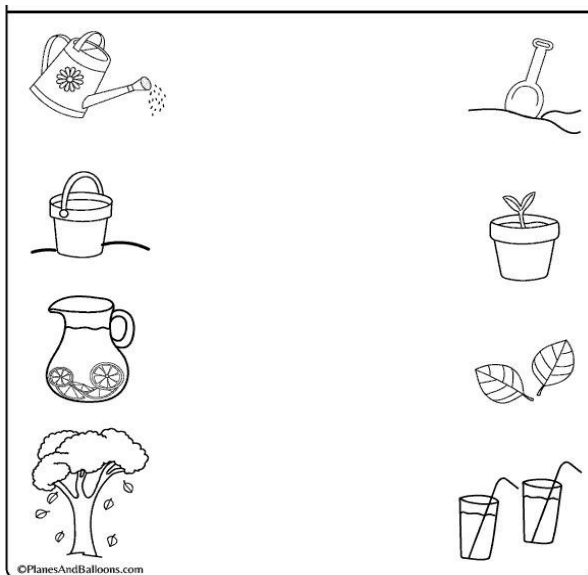
3. ബന്ധം കണ്ടെത്തി പൂരിപ്പിക്കുക?



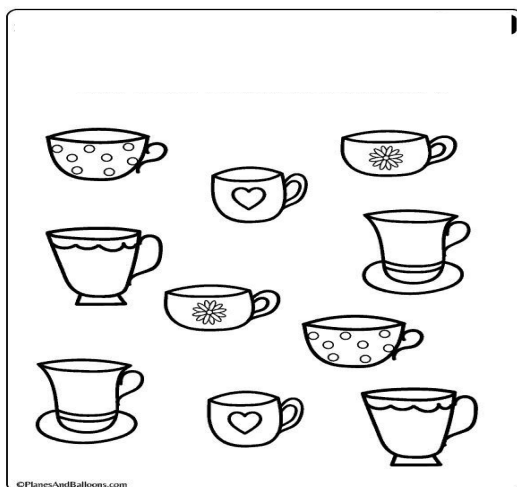
4. ചുവടെ നൽകിയിരിക്കുന്ന ചിത്രം പൂർത്തിയാക്കുക?



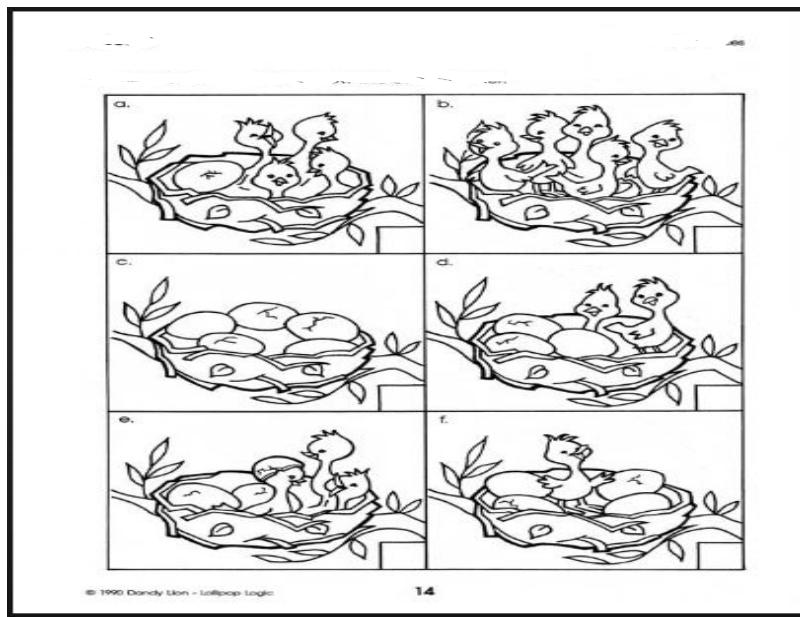
5. ചേരുംപടി ചേർക്കുക?



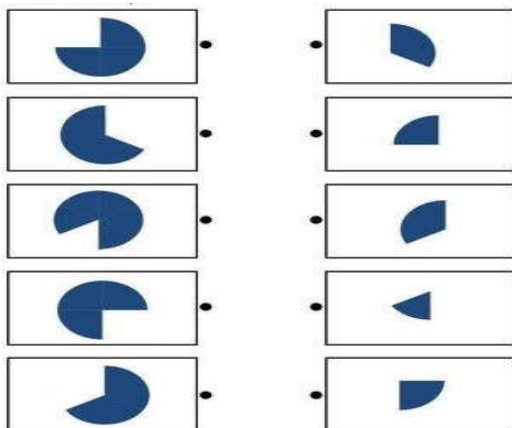
6. ജോഡികളെ കണ്ടെത്തുക?



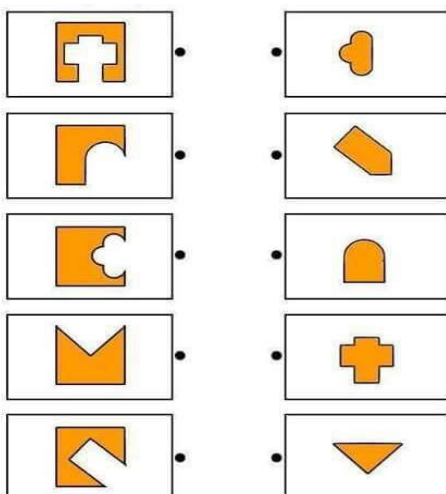
7. ഈ ചിത്രങ്ങൾ കൃത്യമായ ക്രമത്തിൽ അക്കമിടുക?



8. ചേരുപടി ചേർക്കുക



9. ചേരുപടി ചേർക്കുക



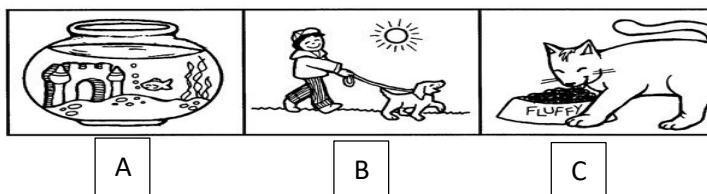
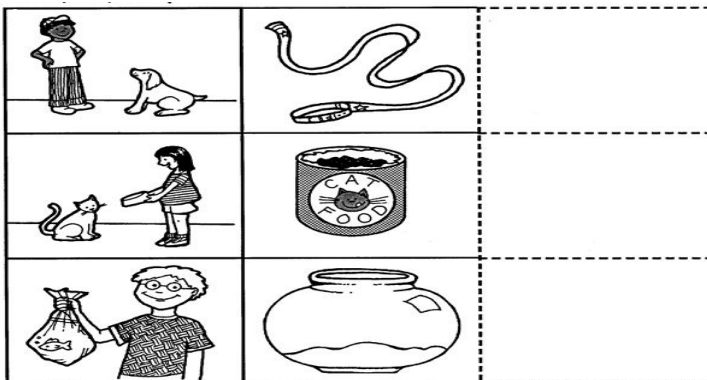
10. അമ്മ, അപ്പ, അച്ച എന്നിവർ പറഞ്ഞ സമയങ്ങളാണ് താഴെ കൊടുത്തിരിക്കുന്നത്. ആര് പറഞ്ഞ സമയം ആണ് ശരിയായിട്ടുള്ളത്?

	അമ്മ	അപ്പ	അച്ച
	12:03	12:15	3:00
	7:25	5:07	5:35
	3:35	7:03	7:15

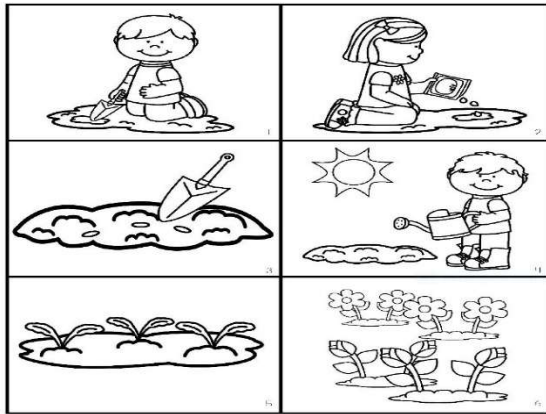
11. താഴെ കൊടുത്തിരിക്കുന്ന ചിത്രം യുക്തി ഉപയോഗിച്ച് പൂർത്തീകരിക്കുക



12. ആദ്യത്തെ രണ്ട് ചിത്രങ്ങൾ നിരീക്ഷിച്ചു അടുത്തായി നടക്കാൻ പോകുന്നത് എന്താണെന്നു തിരഞ്ഞെടുത്തു എഴുതുക?



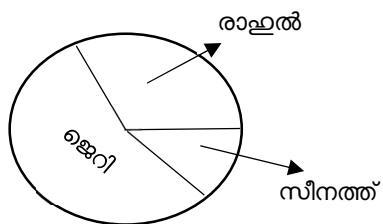
13. ഈ ചിത്രങ്ങൾ കൃത്യമായ ക്രമത്തിൽ അക്കമിടുക?



14. താഴെ പറയുന്ന പദങ്ങൾ കണ്ടെത്തുക
MAN, ONE, DOWN, WIND, TOY

O	T	M	D	T
D	M	I	O	D
N	T	A	W	O
I	C	O	N	T
W	A	E	Y	D

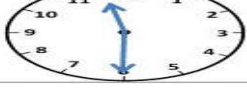
15. 'POLICE' എന്നുള്ള പദത്തെ 654321 എന്ന് എഴുതാമെങ്കിൽ 'ICE' എന്ന പദത്തെ എങ്ങനെ എഴുതാം
- 123
 - 321
 - 654
 - 651
16. രാഹുൽ, ജെറി, സീനത്ത് എന്നിവർ ഒരു കേക്ക് പങ്കുവെച്ചു കഴിക്കുകയായിരുന്നു. ആർക്കാണ് വലിയ പങ്ക് ലഭിച്ചത്?



വിട്ടു പോയ അക്കങ്ങൾ കണ്ടെത്തുക

17. 88, 90, 92, , 96, 98
18. 35, 30, , , 15, 10
19. 4, 8, 16, , , 128
20. 2, 6, 10, , , 22, 26

21. കൃത്യമായ സമയം എഴുതുക

22		5 മിനുറ്റിന് ശേഷം	9:05
23		10 മിനുറ്റിന് ശേഷം	
24		20 മിനുറ്റിന് ശേഷം	
25		1 മണിക്കൂറിന് ശേഷം	
26		15 മിനുറ്റു മുൻപ്	
27		20 മിനുറ്റു മുൻപ്	

ശരിയോ തെറ്റോ എന്ന് രേഖപ്പെടുത്തുക

28. തെങ്ങിനെ കൽപവൃക്ഷം എന്നു പറയുന്നു

29. മൺസൂൺ കാലത്തിൽ കടുത്ത ചൂട് അനുഭവപ്പെടുന്നു

30. ചതുർജ്ജത്തിനു 3 വശങ്ങളുണ്ട്

31. ചന്ദ്രൻ സ്വയം പ്രകാശിക്കുന്നു

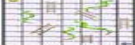
32. ആദ്യത്തെ രണ്ട് ചിത്രങ്ങൾ നിരീക്ഷിക്കുക, അവ എങ്ങനെ ബന്ധപ്പെട്ടിരിക്കുന്നുവെന്ന് മനസ്സിലാക്കുക. തന്നിരിക്കുന്ന ഓപ്ഷനിൽ ആദ്യത്തെ രണ്ടെണ്ണം ബന്ധപ്പെട്ടിരിക്കുന്നതുപോലെ മൂന്നാമത്തെ ചിത്രവുമായി ബന്ധപ്പെട്ട ചിത്രം കണ്ടെത്തുക

1)  ::  ::  :: ?

a)  b)  c) 

2)  ::  ::  :: ?

a)  b)  c) 

3)  ::  ::  :: ?

a)  b)  c) 

4)  ::  ::  :: ?

a)  b)  c) 

5)  ::  ::  :: ?

a)  b)  c) 

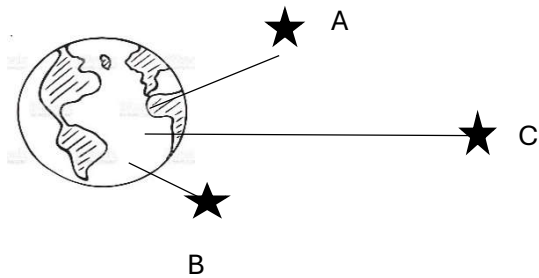
33. താഴെ പറയുന്ന പദങ്ങൾ കണ്ടെത്തുക

COW, TREE, BAT, DOG, MILK, RAT, ROSE, EGG, SEA

R	T	R	E	E
O	D	C	R	G
B	R	D	O	G
R	A	M	S	C
O	T	T	E	O
S	E	A	K	W
E	M	I	L	K

Appendix D
Life Skills Assessment Tool for Lower Primary
(English Version – Final)
QUESTIONNAIRE FOR LOWER PRIMARY STUDENTS

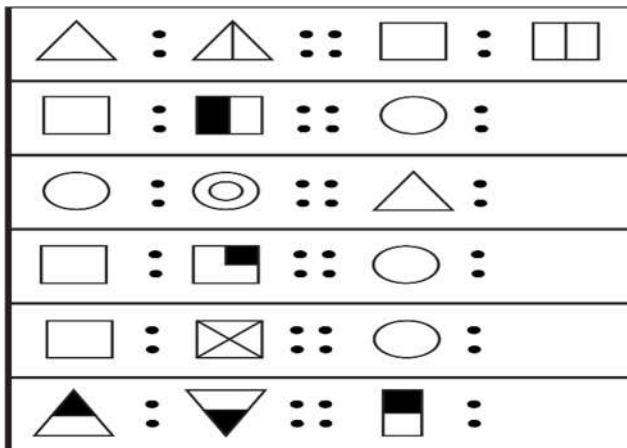
1. Which of these stars is closest to the Earth?



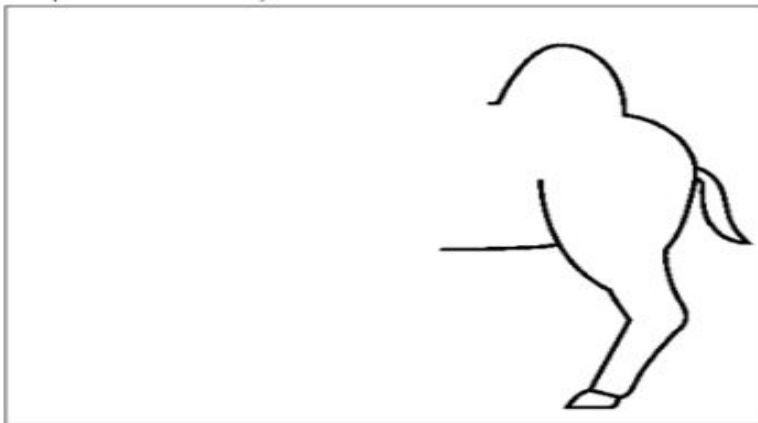
2. Find the picture related to the first image and draw a circle around it

1.		a. 	b. 	c. 
2.		a. 	b. 	c. 
3.		a. 	b. 	c. 
4.		a. 	b. 	c. 
5.		a. 	b. 	c. 

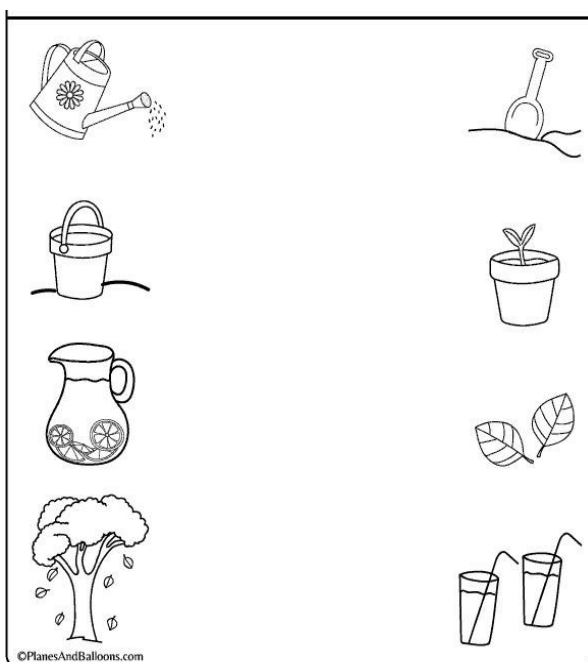
3. Find the relationship and complete it



4. Complete the picture given below



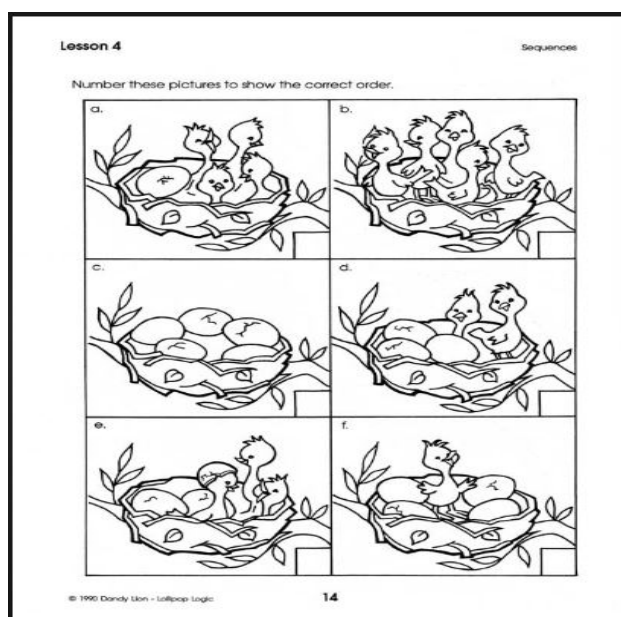
5. Add the matching piece



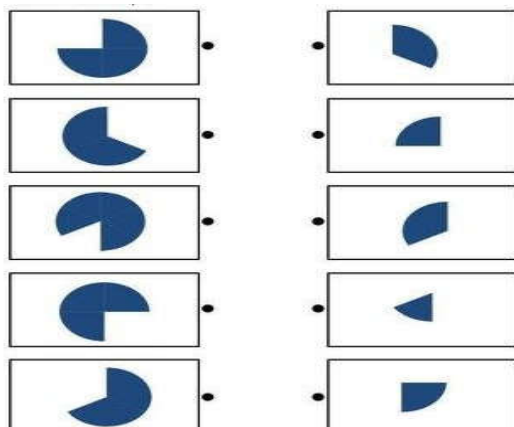
6. Find the pairs



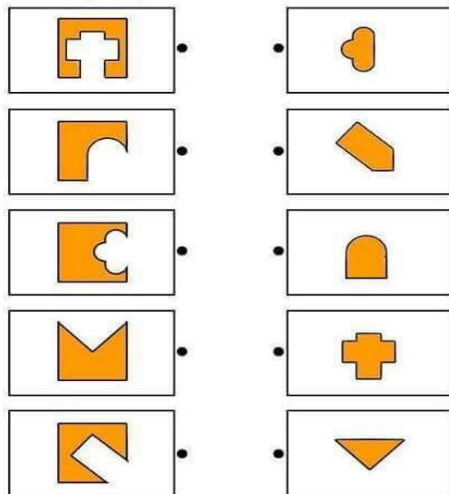
7. Number these pictures in the correct order



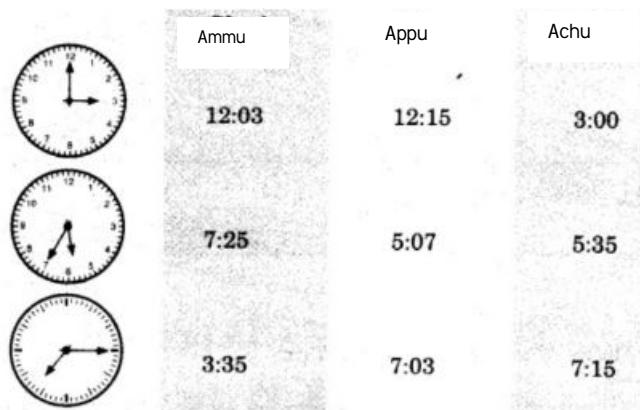
8. Add the matching piece



9. Add the matching piece



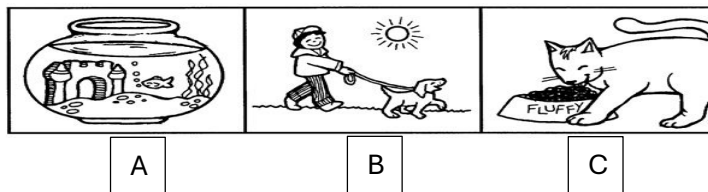
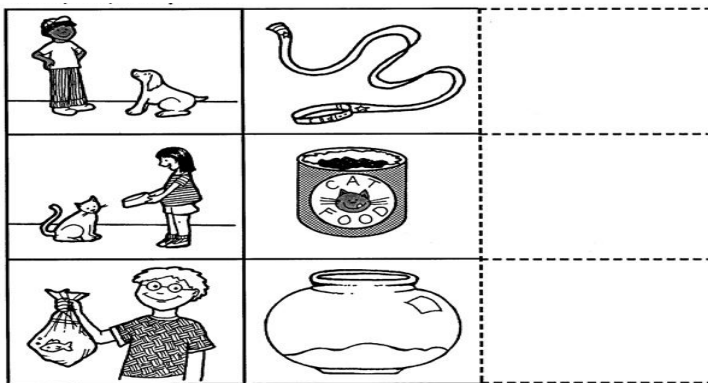
10. Ammu, Appu and Achu have each told a time. The times they said are given below. Whose time is correct?



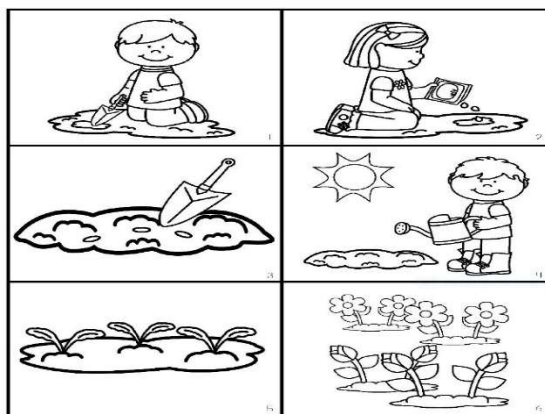
11. Complete the picture below using logic



12. Observe the first two pictures and identify what comes next. Write it down



13. Number these pictures in the correct sequence



14. Find the following words:

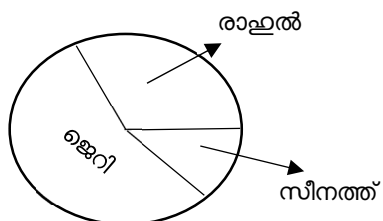
MAN, ONE, DOWN, WIND, TOY

O	T	M	D	T
D	M	I	O	D
N	T	A	W	O
I	C	O	N	T
W	A	E	Y	D

15. If the word 'POLICE' is written as 654321, how would you write the word 'ICE'?

- 123
- 321
- 654
- 651

16. Rahul, Jerry and Seenath were sharing and eating a cake. Who got the biggest portion?



Find the missing numbers

17. 88, 90, 92, , 96, 98

18. 35, 30,,, 15, 10

19. 4, 8, 16,,, 128

20. 2, 6, 10, ,, 22, 26

21. Write the correct time

22		5 minutes later	9:05
23		10 minutes earlier	
24		20 minutes later	
25		1 hour later	
26		15 minutes earlier	
27		20 minutes earlier	

Mark as True or False

28. "The coconut tree is called the Kalpavriksham."

29. "Intense heat is experienced during the monsoon season."

30. "A quadrilateral has 3 sides."

31. "The Moon shines by itself."

32. Observe the first two pictures and understand how they are related. From the given options, find the picture that relates to the third one in the same way as the first two are related.

1)  :  ::  : ?

a)  b)  c) 

2)  :  ::  : ?

a)  b)  c) 

3)  :  ::  : ?

a)  b)  c) 

4)  :  ::  : ?

a)  b)  c) 

5)  :  ::  : ?

a)  b)  c) 

33. Find the following words:

COW, TREE, BAT, DOG, MILK, RAT, ROSE, EGG, SEA

R	T	R	E	E
O	D	C	R	G
B	R	D	O	G
R	A	M	S	C
O	T	T	E	O
S	E	A	K	W
E	M	I	L	K

Appendix E

Scoring Key

Domains- QUESTIONNAIRE (LOWER PRIMARY)

and Each question carries 1 Marks

Questions				Domains		Marks
	Problem solving	Marks	Critical thinking	Marks	Creative thinking	
1	p	1		1		1
2		1		1	c	1
3		1	c	1		1
4		1	c	1	c	1
5	p	1		1		1
6		1	c	1		1
7	p	1		1	c	1
8		1		1	c	1
9	p	1		1		1
10	p	1		1		1
11		1	c	1		1
12		1		1	C	1
13	p	1		1		1
14		1	c	1		1
15		1		1	c	1
16	p	1		1		1
17	p	1		1		1
18	p	1		1		1
19	p	1		1		1
20	p	1	c	1		1
21		1		1	c	1
22		1	c	1		1
23		1		1	c	1
24		1	c	1		1
25		1		1	c	1
26		1	c	1		1
27		1		1	c	1
28	p	1		1		1
29	p	1		1		1
30	p	1		1		1
31	p	1		1		1
32		1	c	1		1
33		1		1	c	1
QUESTIONNAIRE (UPPER PRIMARY)						
1	p	1		1		1
2		1	c	1		1
3	p	1		1		1

4		1		1	c	1
5		1	c	1		1
6	p	1		1		1
7		1		1	c	1
8		1		1	c	1
9		1	c	1		1
10		1	c	1		1
11	p	1		1		1
12	p	1		1		1
13	p	1		1		1
14	p	1		1		1
15	p	1		1		1
16	p	1		1		1
17		1	c	1		1
18		1		1	c	1
19		1	c	1		1
20		1	c	1		1
21		1	c	1		1
22		1		1	c	1
23		1		1	c	1
24		1		1	c	1
25		1	c	1		1
26		1	c	1		1
27		1	c	1		1
28		1	c	1		1
29		1	c	1		1
30	p	1		1		1
31	p	1		1		1
32		1		1	c	1
33		1	c	1		1
34		1	c	1		1
35		1		1	c	1

QUESTIONNAIRE (HIGH SCHOOL)

1	p	1		1		1
2		1	c	1		1
3		1		1	c	1
4		1	c	1		1
5	p	1		1		1
6		1	c	1		1
7		1		1	c	1
8		1	c	1		1
9		1		1	c	1
10		1	c	1		1
11	p	1		1		1
12	p	1		1		1
13	p	1		1		1
14	p	1		1		1

15		1		1	c	1
16		1		1	c	1
17		1	c	1		1
18		1	c	1		1
19		1	c	1		1
20		1		1	c	1
21		1		1	c	1
22		1	c	1		1
23		1	c	1		1
24		1		1	c	1
25	p	1		1		1
26	p	1		1		1
27	p	1		1		1
28	p	1		1		1
29	p	1		1		1
30	p	1		1		1
31		1	c	1		1
32		1		1	c	1
33		1	c	1		1
34	p	1		1		1
35		1	c	1		1

Appendix F
(Life Skill Assessment Test
(Draft Malayalam Version)
QUESTIONNAIRE FOR HIGH SCHOOL

സ്കൂളിന്റെ പേര്

വിദ്യാർത്ഥിയുടെ പേര്

ജെൻഡർ

ക്ലാസ്

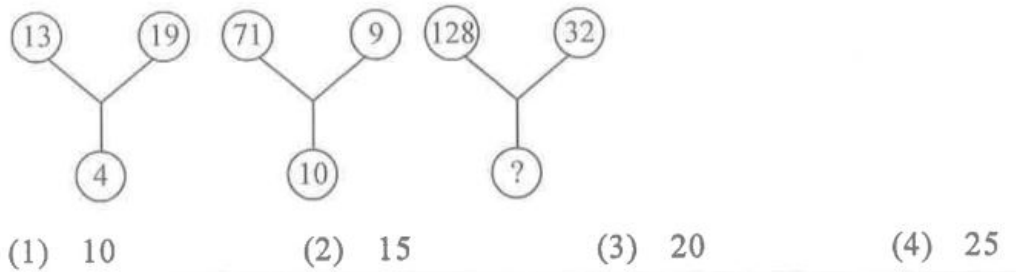
വിഭാഗം: ഇരുള/ കുറമ്പ / മുതുക

ടെപ്പ് ഓഫ് മാനേജ്മെന്റ്: എയ്ഡഡ് / ഗവണ്മെന്റ് / MRS

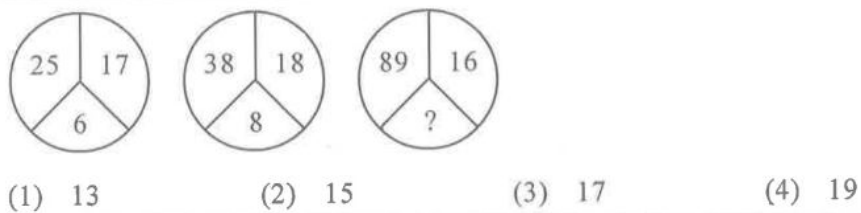
QUESTIONNAIRE (HIGH SCHOOL)

വിട്ടു പോയ സംഖ്യകൾ കണ്ടെത്തുക

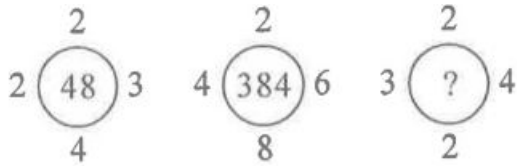
1.



2.



3.



(1) 42

(2) 44

(3) 46

(4) 48

4.

44	42	38
23	55	28
37	?	39

5.

51	11	61
64	30	32
35	?	43

ബന്ധം കണ്ടെത്തി പൂരിപ്പിക്കുക

6. ക്രിക്കറ്റ്: റൺസ് ഫുട്ടബോൾ: ?

1. പോയിന്റ്സ് 2. ഗോൾസ് 3. പെനാൽറ്റി 4. ലെഫ്റ്റ് വിങ്

7. സ്റ്റേറ്റ്: പെൻസിൽ ബുക്ക്: ?

1. പേന 2. റബ്ബർ 3. സ്കെയിൽ 4. കോമ്പസ്

8. എല്ലാ: അസ്ഥികൂടം രക്തം: ?

1. കണ്ണ് 2. ചെവി 3. സിര 4. ത്വക്ക്

9. വൃത്തം: ചുറ്റളവുകൾ ചതുരം: ?

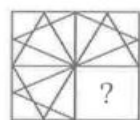
1. വീതി 2. വിസ്തീർണം 3. നീളം 4. പരപ്പളവ്

10. വീഡിയോ: കാസറ്റ് കമ്പ്യൂട്ടർ: ?

1. റിക്കോർഡിങ് 2. ഫയൽ 3. ഫ്ലോപ്പി 4. സി ഡി

പാറ്റേൺ പൂരിപ്പിക്കുക

11.



(X)

(1) 1



(1)

(2) 2



(2)



(3)

(3) 3

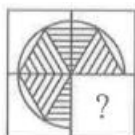


(4)

(4) 4

12.

52.



(X)

(1) 1



(1)

(2) 2



(2)



(3)

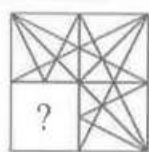
(3) 3



(4)

(4) 4

13.



(X)

(1) 1



(1)

(2) 2



(2)



(3)

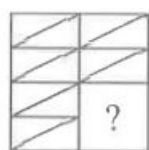
(3) 3



(4)

(4) 4

14.



(X)

(1) 1



(1)

(2) 2



(2)



(3)

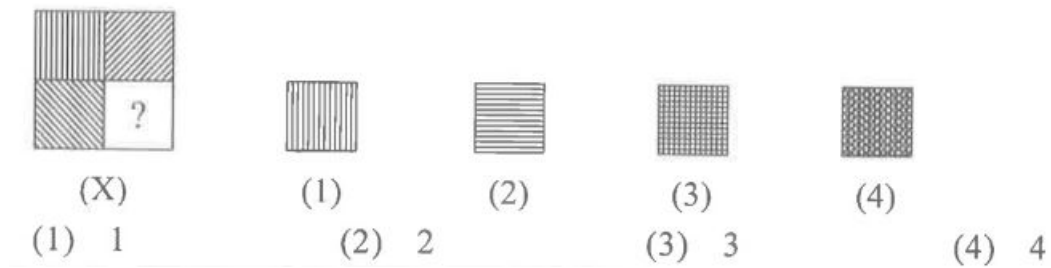
(3) 3



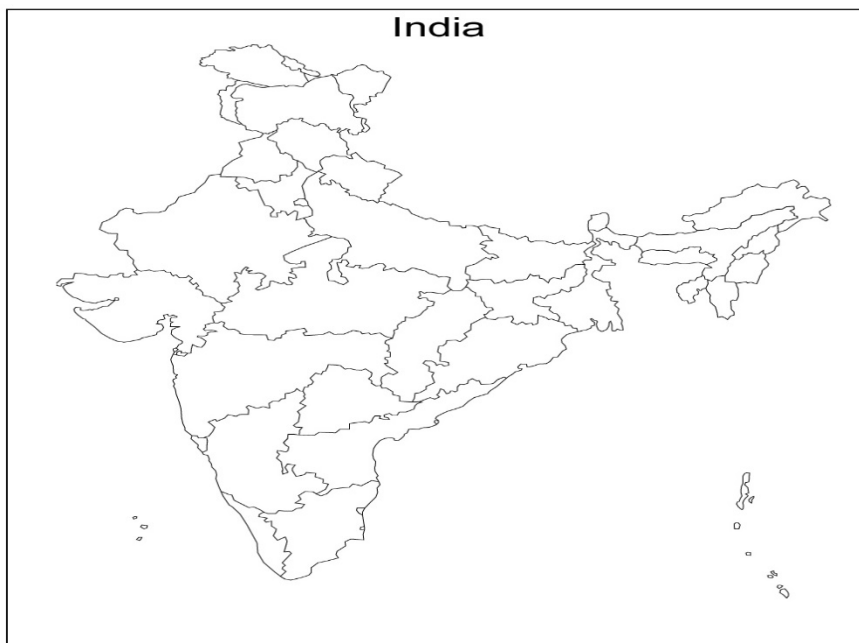
(4)

(4) 4

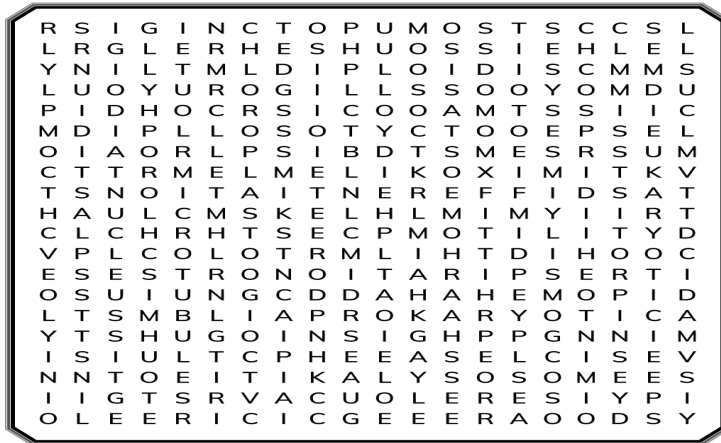
15.



ചുവടെ കൊടുത്തിരിക്കുന്ന ചോദ്യങ്ങൾക്കുള്ള ഉത്തരം കണ്ടെത്തി മാപ്പിൽ മാർക്ക് ചെയ്യുക



16. താജ് മഹൽ സ്ഥിതി ചെയ്യുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
17. ഊട്ടി ഹിൽ സ്റ്റേഷൻ സ്ഥിതി ചെയ്യുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
18. ഏറ്റവും കൂടുതൽ മഴ കിട്ടുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
19. ഇന്ത്യയിൽ ഏറ്റവും അടുത്തിടെ രൂപീകൃതമായ സംസ്ഥാനം അടയാളപ്പെടുത്തുക
20. സബർമതി ആശ്രമം സ്ഥിതി ചെയ്യുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
21. താഴെ കൊടുത്തിരിക്കുന്ന പദങ്ങൾ കണ്ടെത്തുക



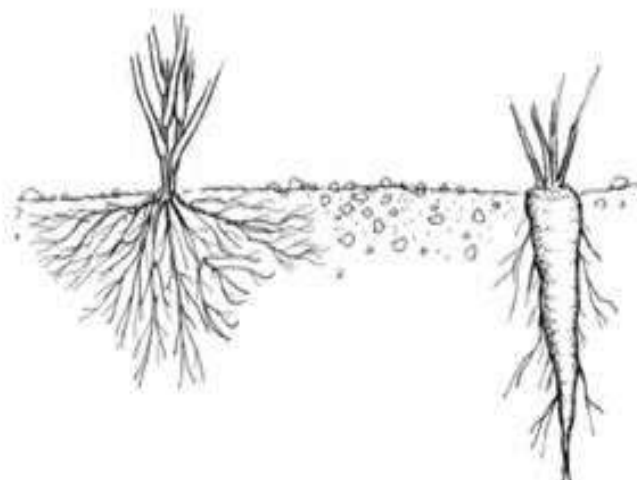
Haploid
Homeostasis
Lysosome
Meiosis
Microtubules
Mitochondria
Mitosis
Motility
Nucleus
Organelle

Osmosis
Phage
Plastid
Prokaryotic
Protist
Respiration
Ribosome
Tissue
Vacuole
Vesicle

22. ചേരുമ്പടി ചേർക്കുക

റിസർവ് വനങ്ങൾ	സർക്കാരിന്റെയും സ്വകാര്യ വ്യക്തികളുടെയും സമൂഹങ്ങളുടെയും വനങ്ങളും തരിശുഭൂമികളും
സംരക്ഷിത വനങ്ങൾ	വനത്തിന്റെയും വന്യജീവി വിഭവങ്ങളുടെയും സംരക്ഷണത്തെ സംബന്ധിച്ചിടത്തോളം ഇത്തരത്തിലുള്ള വനങ്ങളെ ഏറ്റവും മൂല്യവത്തായി കണക്കാക്കുന്നു
തരംതിരിക്കാത്ത വനങ്ങൾ	കൂടുതൽ ശോഷണത്തിൽ നിന്ന് സംരക്ഷിക്കപ്പെടുന്ന തരത്തിലുള്ള വനഭൂമി

23. താഴെ കൊടുത്തിരിക്കുന്ന ചിത്രത്തിലെ ചെടിയുടെ വേരുകൾ നിരീക്ഷിച്ചു അവയുടെ തണ്ടുകൾ വരയ്ക്കുക

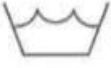


24. ചേരുമ്പടി ചേർക്കുക

കവാടം =
മിഴി =
പർവതം =
മാർഗം =
മലിനം =
പ്രപഞ്ചം =
ശൃംഖല =
ദൃശ്യം =
ദൃഷ്ടിതം =
കർശനം =

കുന്ന്
ലോകം
വാതിൽ
ചങ്ങല
കാഴ്ച
വഴി
നിബന്ധം
അഴുക്ക്
കണ്ണ്
ചിത്തയായ

25. ചേരുംപടി ചേർക്കുക

- i) 
ii) 
iii) 
iv) 

- a) Wash
b) Bleach
c) Iron
d) Do not bleach

ഈ നാല് ചിത്രങ്ങളിൽ മൂന്നെണ്ണം ഒരു പ്രത്യേക രീതിയിൽ സമാനമാണ്. ബാക്കിയുള്ളതിൽ നിന്ന് വ്യത്യസ്തമായ ചിത്രം തിരഞ്ഞെടുക്കുക

26.

			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

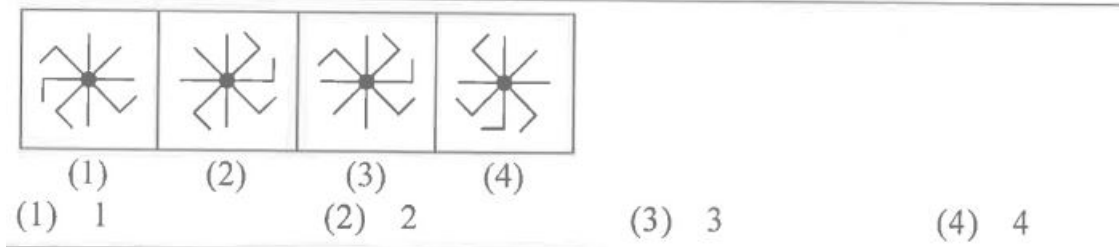
27.

			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

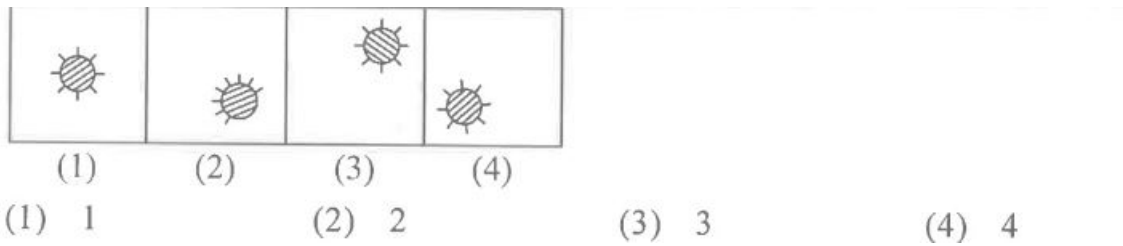
28.

			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

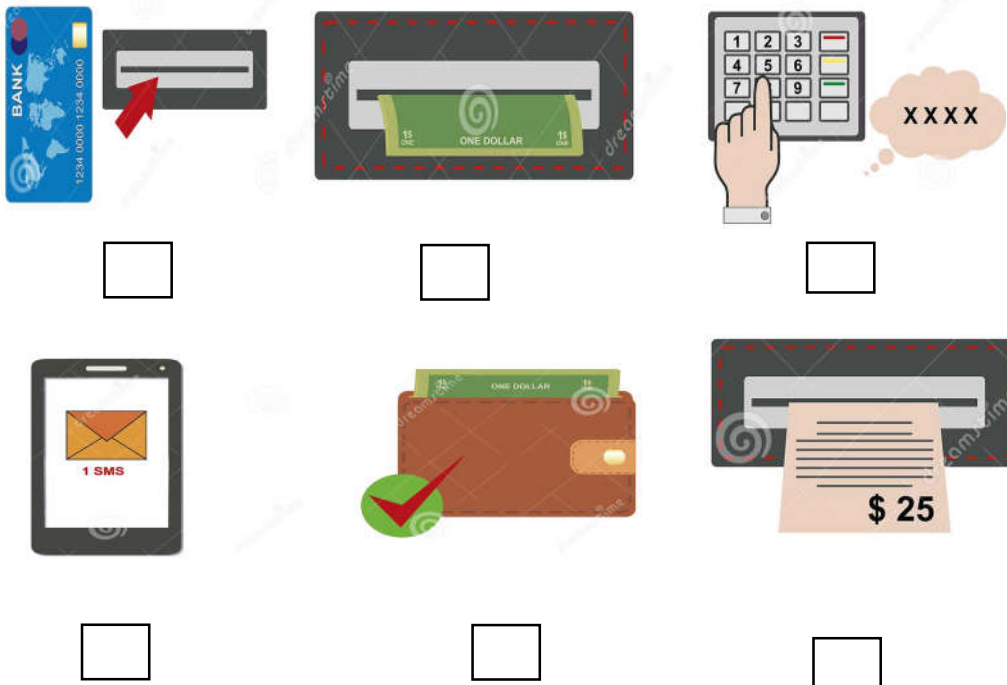
29.



30.



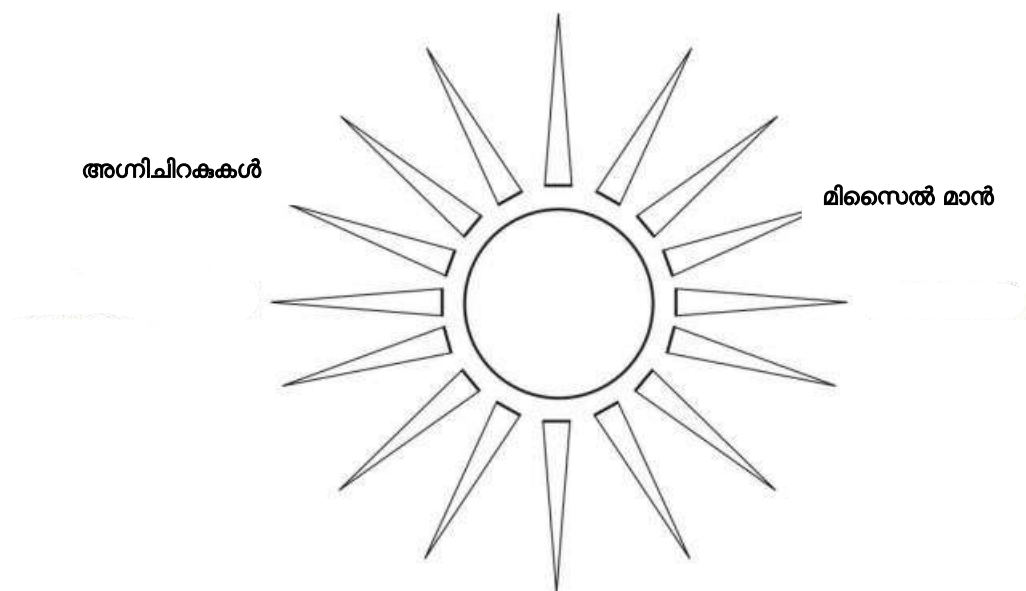
31. ATM ൽ നിന്നും പൈസ എടുക്കുന്ന പ്രക്രിയ ആണ് ചുവടെ കൊടുത്തിരിക്കുന്നത് ഈ ചിത്രങ്ങൾ ശരിയായ ക്രമത്തിൽ ക്രമീകരിക്കുക



32. താഴെ തന്നിരിക്കുന്ന ട്രാഫിക് സിഗ്നൽ എന്താണ് ഉദ്ദേശിക്കുന്നതെന്നു എഴുതുക

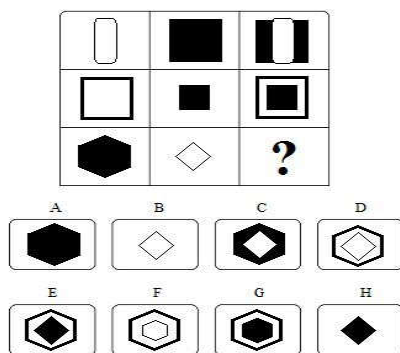


33. APJ അബ്ദുൾ കലാപുരയിൽ ബന്ധപ്പെട്ട ആശയസൂത്രം വിപുലീകരിക്കുക

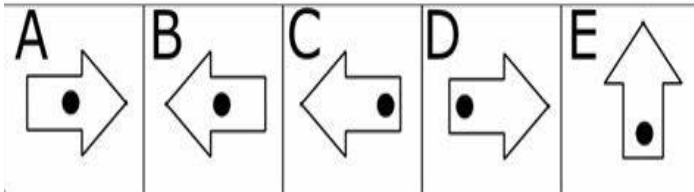
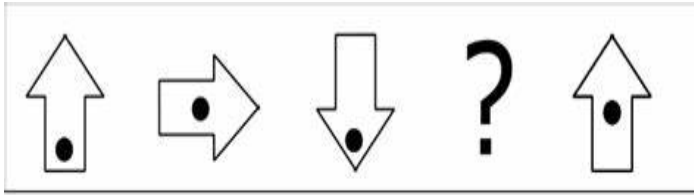


താഴെ കൊടുത്തിരിക്കുന്ന പാറ്റേൺ പൂർത്തീകരിക്കുക

34.



35.



36. എനിക്ക് ഒരു ബുദ്ധിമുട്ടായ സാഹചര്യം വരുമ്പോൾ, ലഭ്യമായ വഴികൾ കണ്ടെത്തി, ഓരോതിന്റെയും ഫലങ്ങൾ ചിന്തിച്ച്, ഏറ്റവും നല്ലത് തിരഞ്ഞെടുത്ത് പ്രവർത്തിക്കുന്നു.
- ☐ എപ്പോഴും ☐ പലപ്പോഴും ☐ ചിലപ്പോൾ ☐ അപൂർവ്വമായി ☐ ഒരിക്കലും ഇല്ല
37. എനിക്ക് സമ്മർദ്ദമോ ദുഃഖമോ തോന്നുമ്പോൾ, (ഉദാഹരണം: പ്ലാൻ ചെയ്യുക, കുറച്ച് സമയം വിശ്രമിക്കുക, ഒരാളോട് സംസാരിക്കുക) പോലെയുള്ള ആരോഗ്യകരമായ മാർഗങ്ങൾ ഉപയോഗിച്ച് ഞാൻ എന്റെ വികാരങ്ങളെ നിയന്ത്രിക്കുന്നു.
- ☐ എപ്പോഴും ☐ പലപ്പോഴും ☐ ചിലപ്പോൾ ☐ അപൂർവ്വമായി ☐ ഒരിക്കലും ഇല്ല

Appendix G
Life Skill Assessment Test
(Draft English Version)

Questionnaire for High School Students

Name of the School

Name of the Student

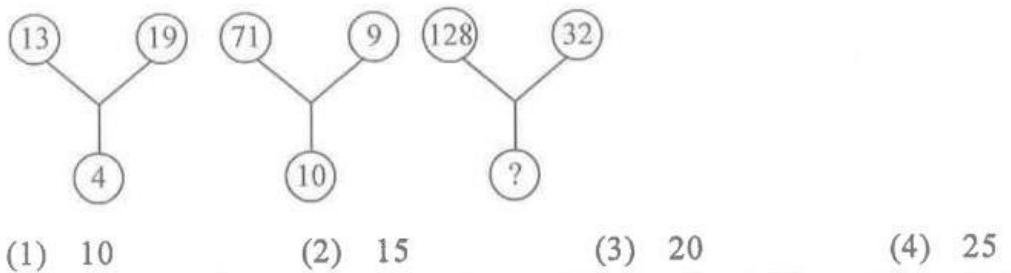
Gender

Class

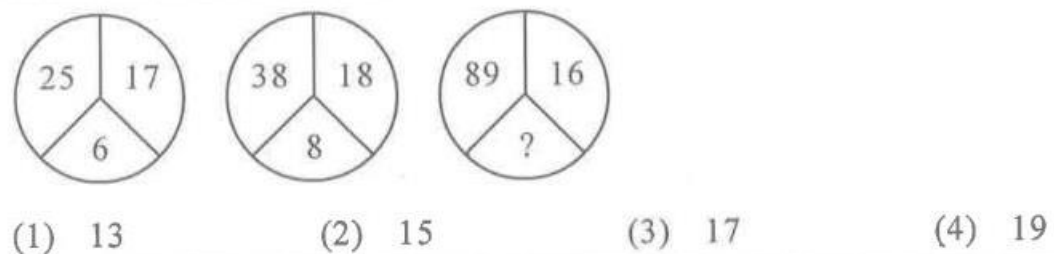
Category: Irula / Kurumba / Muduga

Type of Management: Aided / Government / MRS

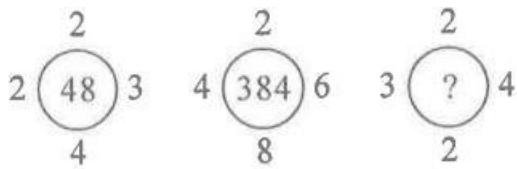
1. Find the missing numbers



2.



3.



- (1) 42 (2) 44 (3) 46 (4) 48

4.

44	42	38
23	55	28
37	?	39

5.

51	11	61
64	30	32
35	?	43

Find the relationship and fill in the blanks

6. Cricket : Runs Football :

1. Points 2. Goals 3. Penalty 4. Left Wing

7. Slate : Pencil Book : ?

1. Pen 2. Eraser 3. Scale 4. Compass

8. Bone : Skeleton Blood : ?

1. Eye 2. Ear 3. Vein 4. Skin

9. Circle : Circumference Square : ?

1. Width 2. Area 3. Length 4. Perimeter

10. Video : Cassette Computer : ?

1. Recording

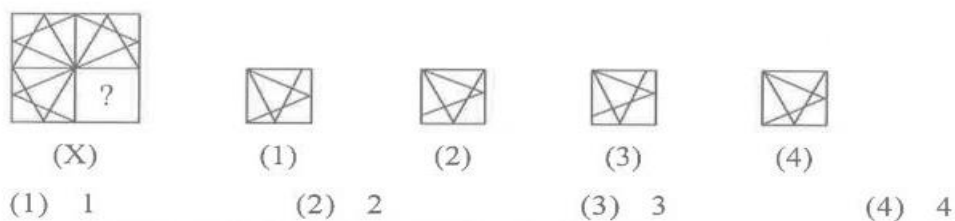
2. File

3. Floppy

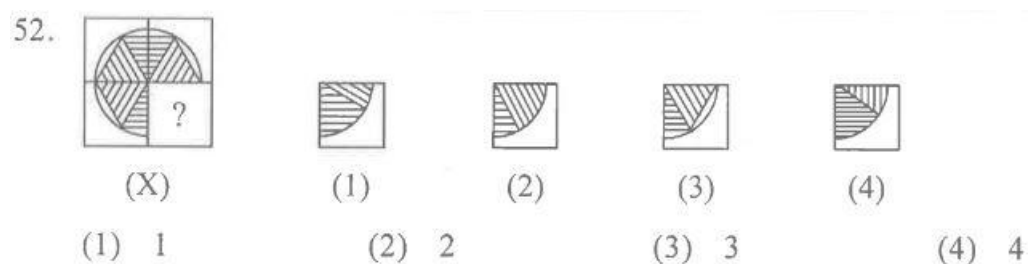
4. CD

Complete the pattern

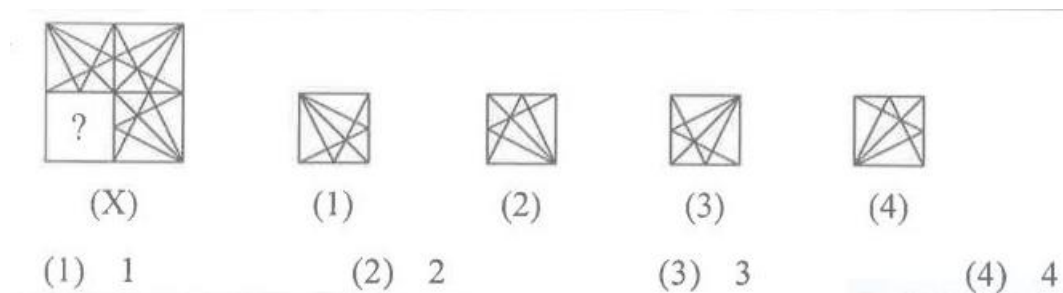
11.



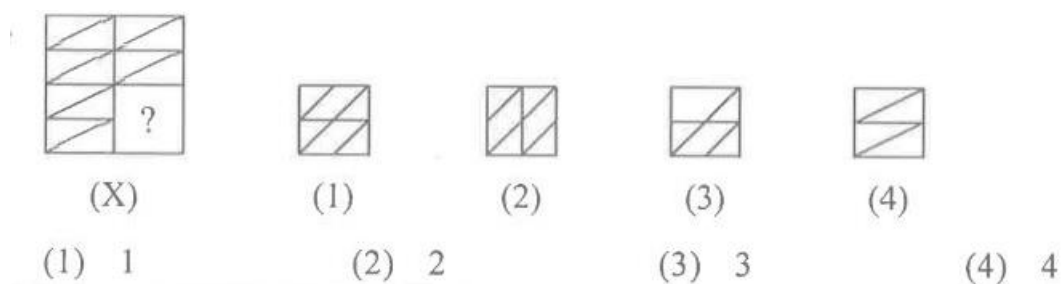
12.



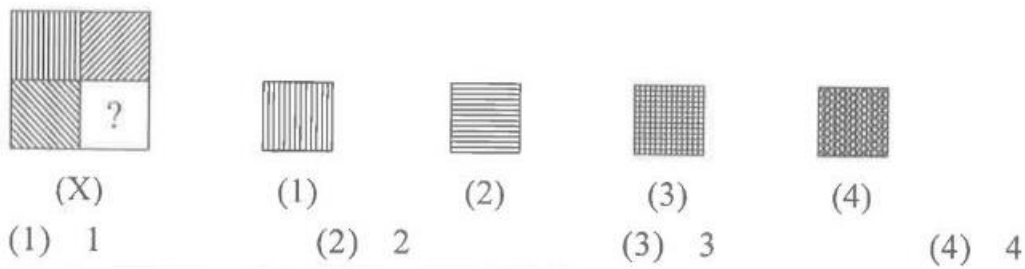
13.



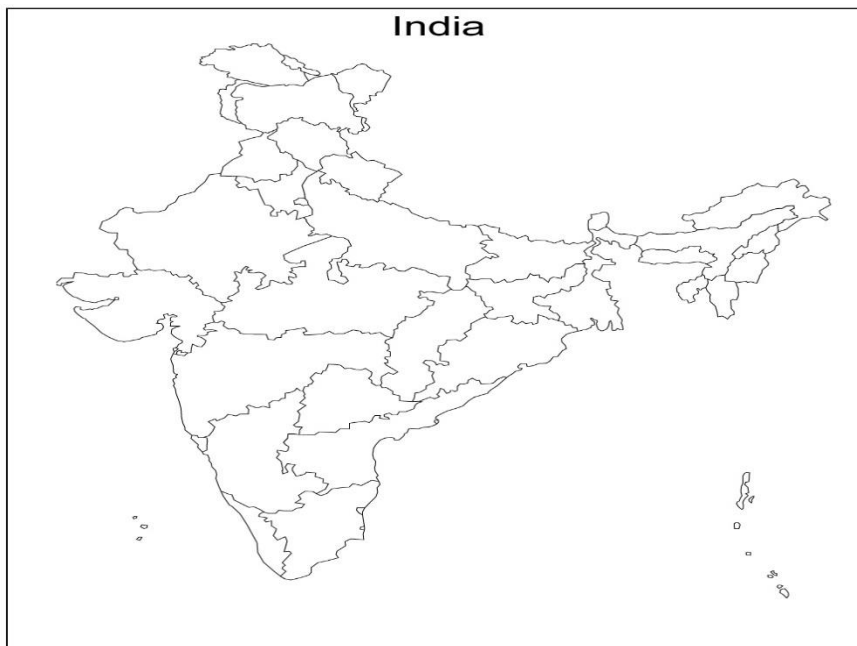
14.



15.



Find the answers to the following questions and mark them on the map



16. Mark the state where the Taj Mahal is located.

17. Mark the state where the Ooty hill station is located.

18. Mark the state that receives the highest rainfall.

19. Mark the most recently formed state in India.

20. Mark the state where the Sabarmati Ashram is located.

21. Find the words given below.

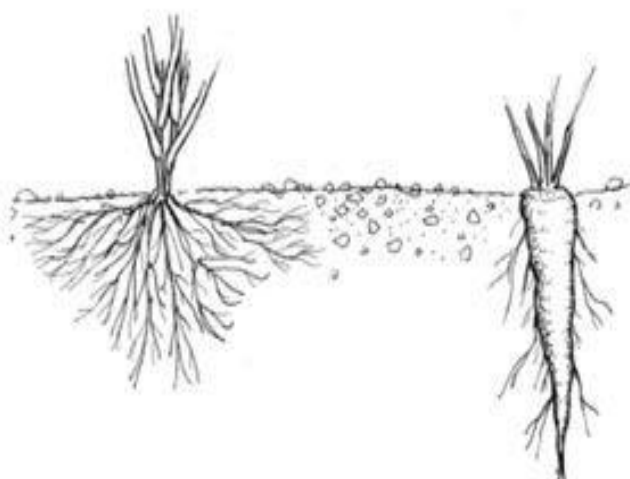


Haploid
Homeostasis
Lysosome
Meiosis
Microtubules
Mitochondria
Mitosis
Motility
Nucleus
Organelle
Osmosis
Phage
Plastid
Prokaryotic
Protist
Respiration
Ribosome
Tissue
Vacuole
Vesicle

22. Match the pairs

Reserved Forests	Forests and wastelands owned by the government, private individuals, and communities
Protected Forests	Such forests are considered the most valuable in terms of the conservation of forest and wildlife resources
Unclassified Forests	Type of forest land that is protected from excessive exploitation

23. Observe the roots of the plant shown in the picture below and draw its stems.



24. Match the pairs

കവാടം =

മിഴി =

പർവതം =

മാർഗം =

മലിനം =

പ്രപഞ്ചം =

ശൃംഖല =

ദൃശ്യം =

ദൃഷ്ടിതം =

കർശനം =

കുന്ന്

ലോകം

വാതിൽ

ചങ്ങല

കാഴ്ച

വഴി

നിബന്ധം

അഴുക്ക്

കണ്ണ്

ചിത്തയായ

25. Match the pairs

i) 

ii) 

iii) 

iv) 

a) Wash

b) Bleach

c) Iron

d) Do not bleach

Out of these four pictures, three are similar in a particular way. Choose the one that is different from the rest.

26.

			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

27.

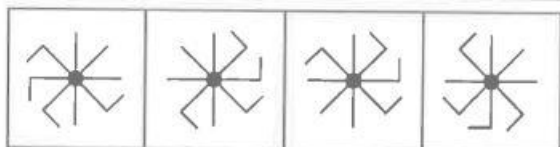
			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

28.



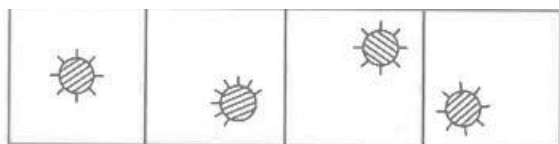
(1) (1) (2) (3) (4)
(1) 1 (2) 2 (3) 3 (4) 4

29.



(1) (1) (2) (3) (4)
(1) 1 (2) 2 (3) 3 (4) 4

30.



(1) (1) (2) (3) (4)
(1) 1 (2) 2 (3) 3 (4) 4

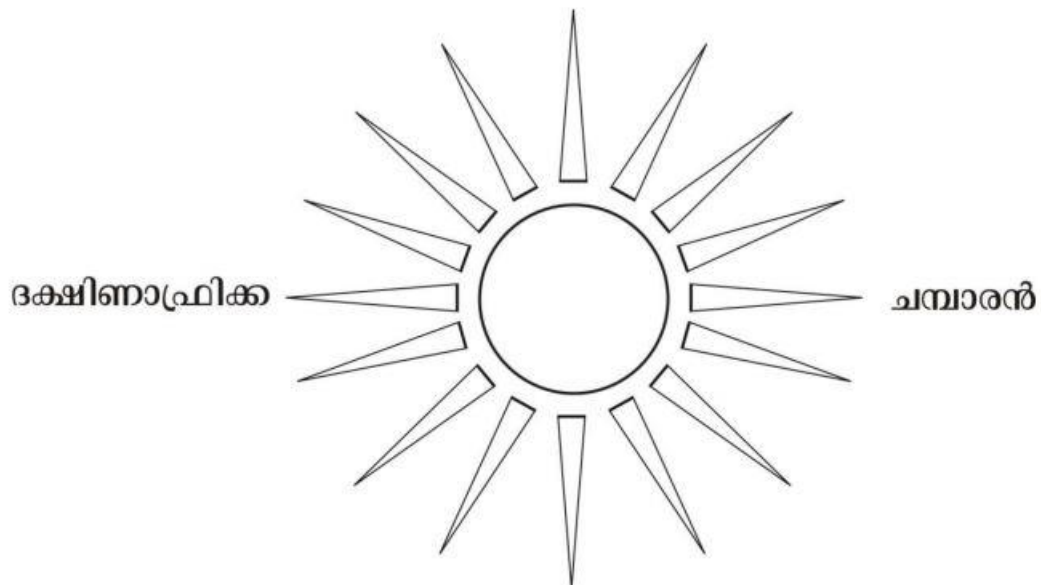
31. The process of withdrawing money from an ATM is shown below. Arrange these pictures in the correct order.



32. Write what the traffic signal shown below indicates.

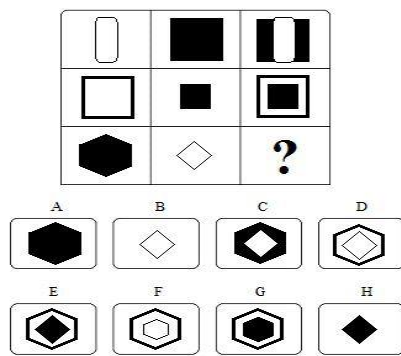


33 Expand the mind map related to APJ Abdul Kalam.

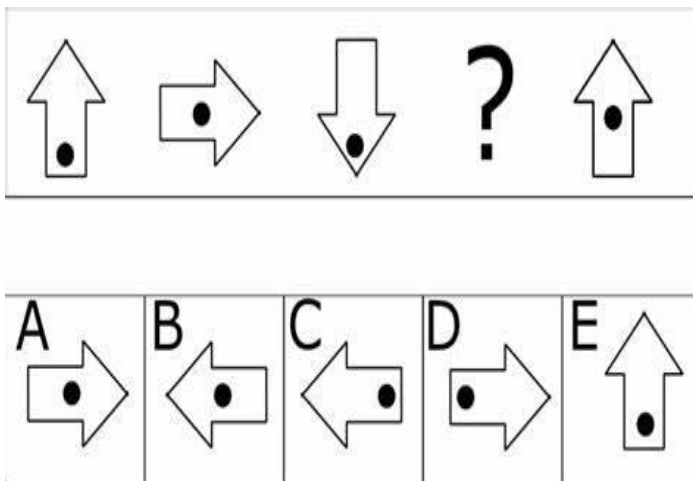


Complete the pattern given below

34.



35.



Appendix H
Life Skill Assessment Test
(Final Malayalam Version)
QUESTIONNAIRE FOR HIGH SCHOOL

സ്കൂളിന്റെ പേര്

വിദ്യാർത്ഥിയുടെ പേര്

ജെൻഡർ

ക്ലാസ്

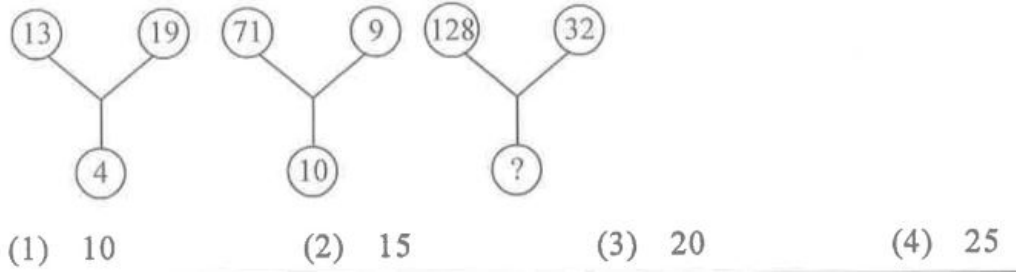
വിഭാഗം: ഇരുള/ കുറമ്പ / മുതുക

ടെപ്പ് ഓഫ് മാനേജ്മെന്റ്: എയ്ഡഡ് / ഗവണ്മെന്റ് / MRS

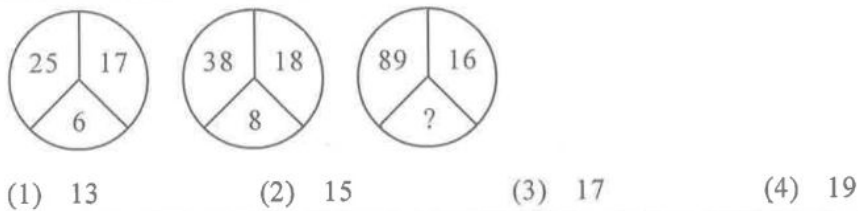
QUESTIONNAIRE (HIGH SCHOOL)

വിട്ടു പോയ സംഖ്യകൾ കണ്ടെത്തുക

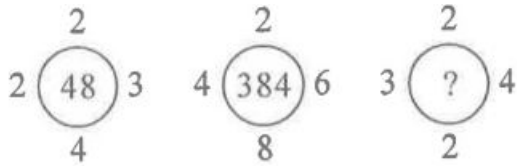
1.



2.



3.



(1) 42

(2) 44

(3) 46

(4) 48

4.

44	42	38
23	55	28
37	?	39

5.

51	11	61
64	30	32
35	?	43

ബന്ധം കണ്ടെത്തി പൂരിപ്പിക്കുക

6. ക്രിക്കറ്റ്: റൺസ് ഫുട്ബോൾ: ?

1. പോയിന്റ്സ് 2. ഗോൾസ് 3. പെനാൽറ്റി 4. ലെഫ്റ്റ് വിങ്

7. സ്റ്റേറ്റ്: പെൻസിൽ ബുക്ക്: ?

1. പേന 2. റബ്ബർ 3. സ്കെയിൽ 4. കോമ്പസ്

8. എല്ലാ: അസ്ഥികൂടം രക്തം: ?

1. കണ്ണ് 2. ചെവി 3. സിര 4. ത്വക്ക്

9. വൃത്തം: ചുറ്റളവുകൾ ചതുരം: ?

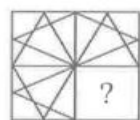
1. വീതി 2. വിസ്തീർണം 3. നീളം 4. പരപ്പളവ്

10. വീഡിയോ: കാസറ്റ് കമ്പ്യൂട്ടർ: ?

1. റിക്കോർഡിങ് 2. ഫയൽ 3. ഫ്ലോപ്പി 4. സി ഡി

പാറ്റേൺ പൂരിപ്പിക്കുക

11.



(X)

(1) 1



(1)

(2) 2



(2)



(3)

(3) 3

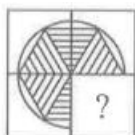


(4)

(4) 4

12.

52.



(X)

(1) 1



(1)

(2) 2



(2)

(3) 3



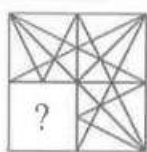
(3)

(4) 4



(4)

13.



(X)

(1) 1



(1)

(2) 2



(2)

(3) 3



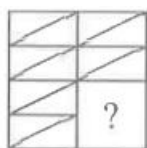
(3)

(4) 4



(4)

14.



(X)

(1) 1



(1)

(2) 2



(2)

(3) 3



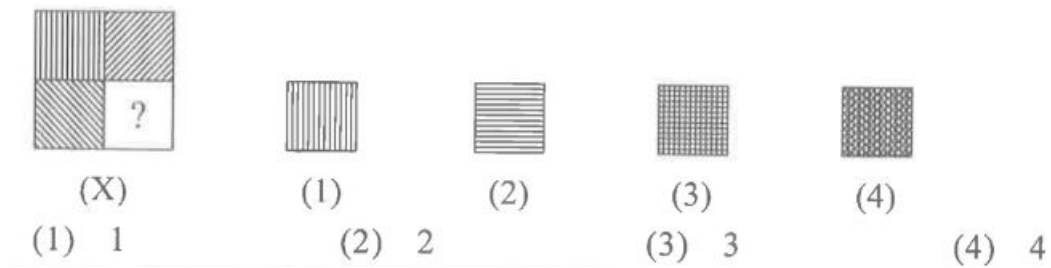
(3)

(4) 4

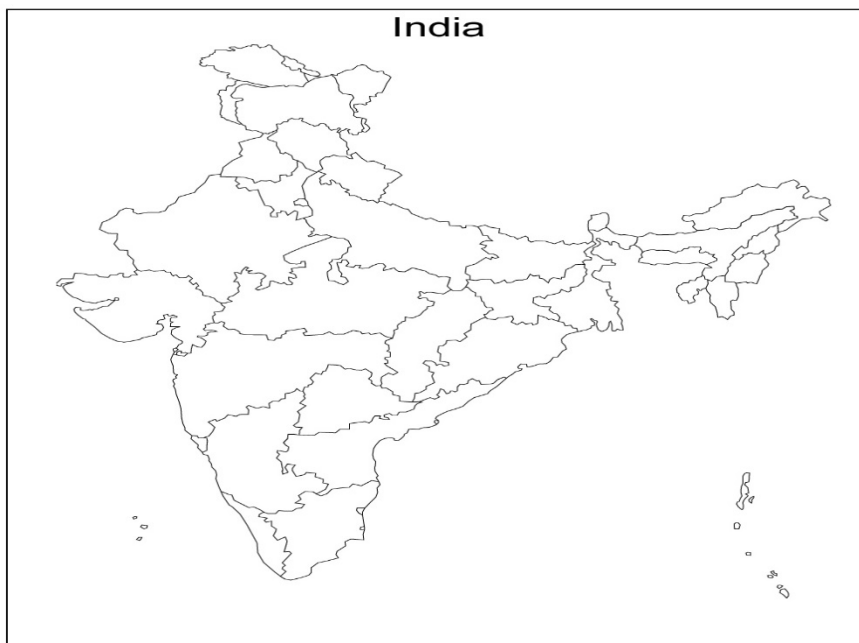


(4)

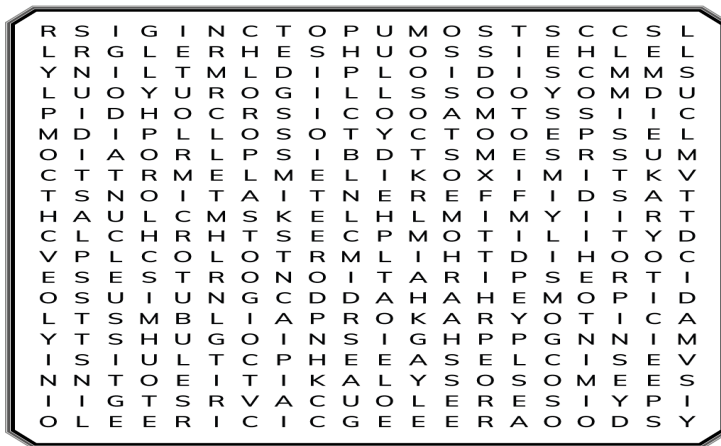
15.



ചുവടെ കൊടുത്തിരിക്കുന്ന ചോദ്യങ്ങൾക്കുള്ള ഉത്തരം കണ്ടെത്തി മാപ്പിൽ മാർക്ക് ചെയ്യുക



16. താജ് മഹൽ സ്ഥിതി ചെയ്യുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
17. ഊട്ടി ഹിൽ സ്റ്റേഷൻ സ്ഥിതി ചെയ്യുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
18. ഏറ്റവും കൂടുതൽ മഴ കിട്ടുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
19. ഇന്ത്യയിൽ ഏറ്റവും അടുത്തിടെ രൂപീകൃതമായ സംസ്ഥാനം അടയാളപ്പെടുത്തുക
20. സബർമതി ആശ്രമം സ്ഥിതി ചെയ്യുന്ന സംസ്ഥാനം അടയാളപ്പെടുത്തുക
21. താഴെ കൊടുത്തിരിക്കുന്ന പദങ്ങൾ കണ്ടെത്തുക



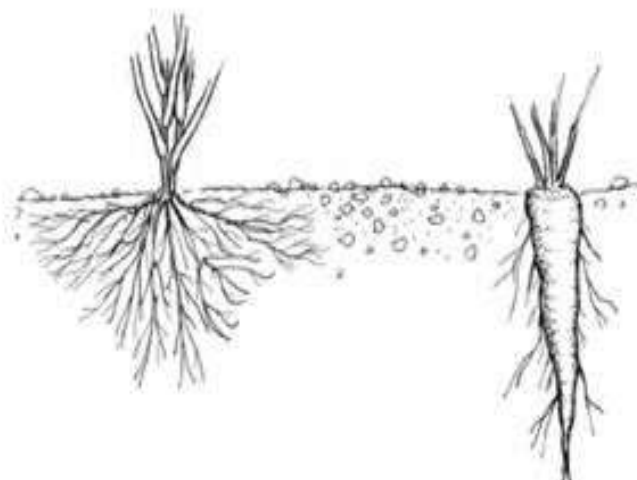
Haploid
Homeostasis
Lysosome
Meiosis
Microtubules
Mitochondria
Mitosis
Motility
Nucleus
Organelle

Osmosis
Phage
Plastid
Prokaryotic
Protist
Respiration
Ribosome
Tissue
Vacuole
Vesicle

22. ചേരുമ്പടി ചേർക്കുക

റിസർവ് വനങ്ങൾ	സർക്കാരിന്റെയും സ്വകാര്യ വ്യക്തികളുടെയും സമൂഹങ്ങളുടെയും വനങ്ങളും തരിശുഭൂമികളും
സംരക്ഷിത വനങ്ങൾ	വനത്തിന്റെയും വന്യജീവി വിഭവങ്ങളുടെയും സംരക്ഷണത്തെ സംബന്ധിച്ചിടത്തോളം ഇത്തരത്തിലുള്ള വനങ്ങളെ ഏറ്റവും മൂല്യവത്തായി കണക്കാക്കുന്നു
തരംതിരിക്കാത്ത വനങ്ങൾ	കൂടുതൽ ശോഷണത്തിൽ നിന്ന് സംരക്ഷിക്കപ്പെടുന്ന തരത്തിലുള്ള വനഭൂമി

23. താഴെ കൊടുത്തിരിക്കുന്ന ചിത്രത്തിലെ ചെടിയുടെ വേരുകൾ നിരീക്ഷിച്ചു അവയുടെ തണ്ടുകൾ വരയ്ക്കുക

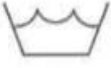


24. ചേരുമ്പടി ചേർക്കുക

കവാടം =
മിഴി =
പർവതം =
മാർഗം =
മലിനം =
പ്രപഞ്ചം =
ശൃംഖല =
ദൃശ്യം =
ദൃഷ്ടിതം =
കർശനം =

കുന്ന്
ലോകം
വാതിൽ
ചങ്ങല
കാഴ്ച
വഴി
നിബന്ധം
അഴുക്ക്
കണ്ണ്
ചിത്തയായ

25. ചേരുംപടി ചേർക്കുക

- i) 
ii) 
iii) 
iv) 

- a) Wash
b) Bleach
c) Iron
d) Do not bleach

ഈ നാല് ചിത്രങ്ങളിൽ മൂന്നെണ്ണം ഒരു പ്രത്യേക രീതിയിൽ സമാനമാണ്. ബാക്കിയുള്ളതിൽ നിന്ന് വ്യത്യസ്തമായ ചിത്രം തിരഞ്ഞെടുക്കുക

26.

			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

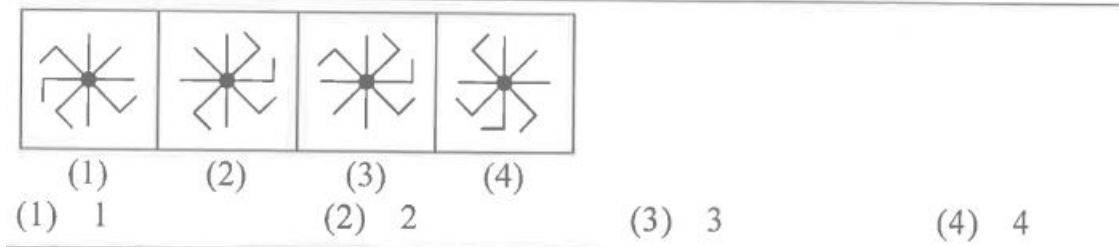
27.

			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

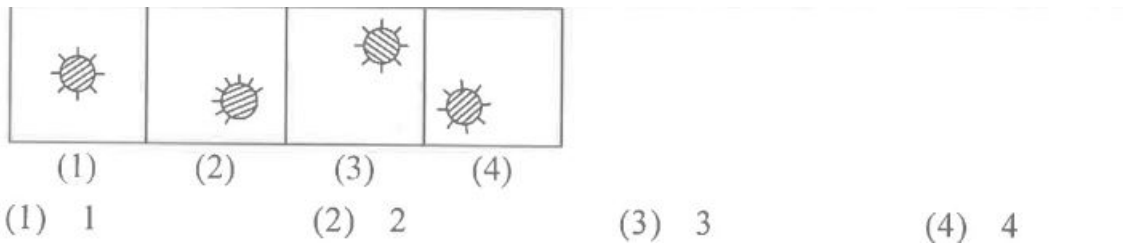
28.

			
(1)	(2)	(3)	(4)
(1) 1	(2) 2	(3) 3	(4) 4

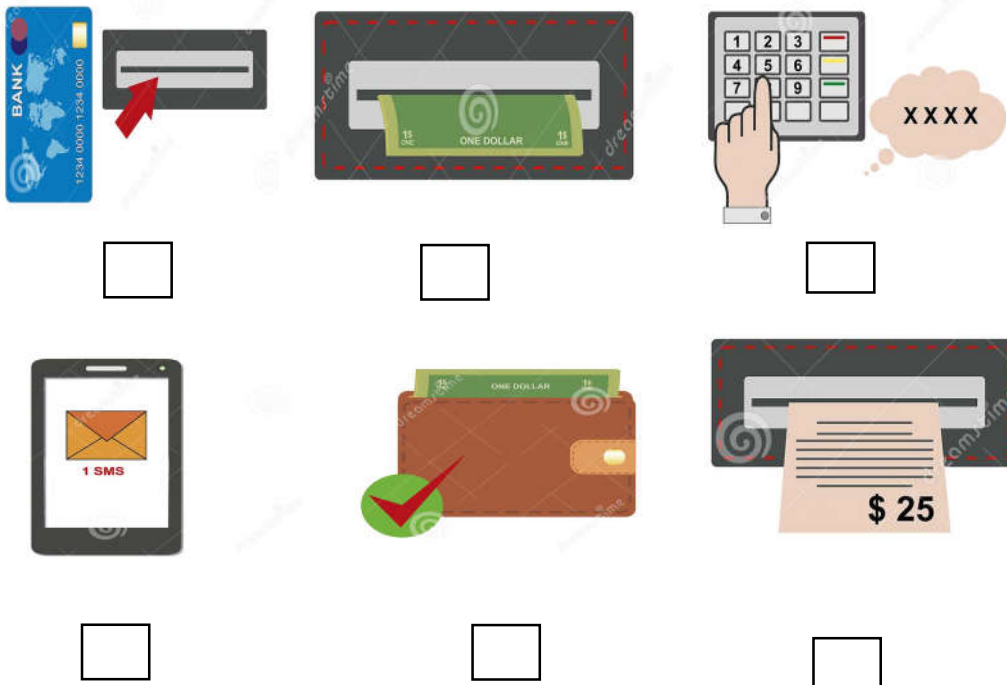
29.



30.



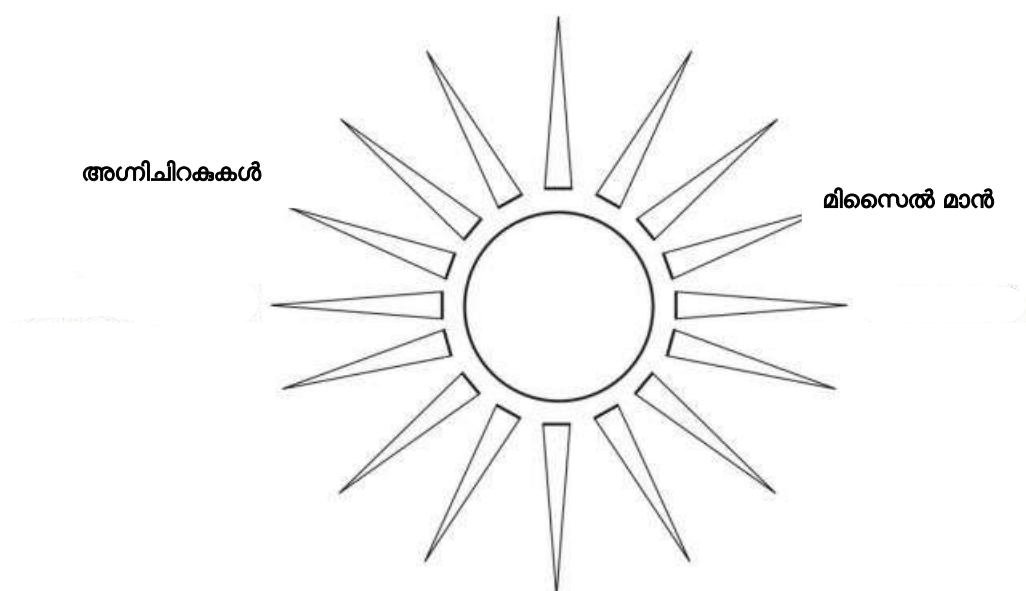
31. ATM ൽ നിന്നും പൈസ എടുക്കുന്ന പ്രക്രിയ ആണ് ചുവടെ കൊടുത്തിരിക്കുന്നത് ഈ ചിത്രങ്ങൾ ശരിയായ ക്രമത്തിൽ ക്രമീകരിക്കുക



32. താഴെ തന്നിരിക്കുന്ന ട്രാഫിക് സിഗ്നൽ എന്താണ് ഉദ്ദേശിക്കുന്നതെന്ന് എഴുതുക

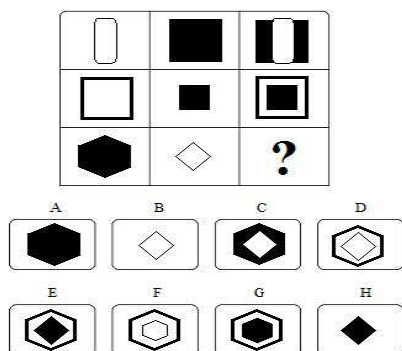


33. APJ അബ്ദുൾ കലാമയായി ബന്ധപ്പെട്ട ആശയസൂര്യൻ വിപുലീകരിക്കുക

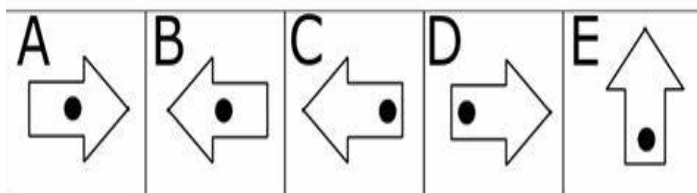
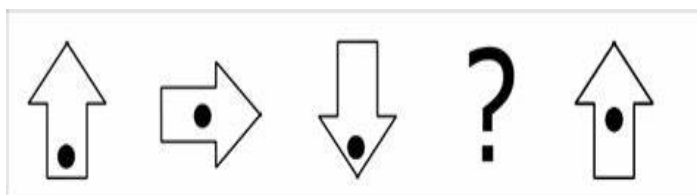


താഴെ കൊടുത്തിരിക്കുന്ന പാറ്റേൺ പൂർത്തീകരിക്കുക

34.



35.



Appendix I
(Life Skill Assessment Test)
Final (English Version)

Questionnaire for High School Students

Name of the School

Name of the Student

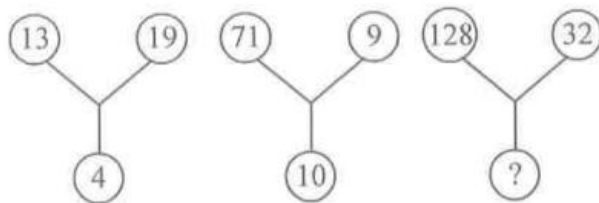
Gender

Class

Category: Irula / Kurumba / Muduga

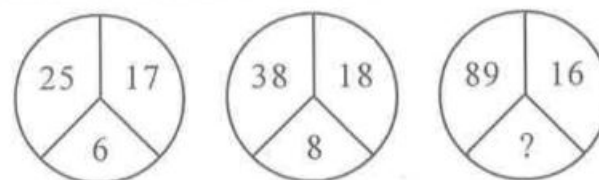
Type of Management: Aided / Government / MRS

1. Find the missing numbers



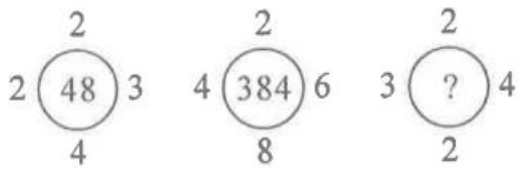
- (1) 10 (2) 15 (3) 20 (4) 25
-

2.



- (1) 13 (2) 15 (3) 17 (4) 19
-

3.



- (1) 42 (2) 44 (3) 46 (4) 48

4.

44	42	38
23	55	28
37	?	39

5.

51	11	61
64	30	32
35	?	43

Find the relationship and fill in the blanks

6. Cricket : Runs Football :

1. Points 2. Goals 3. Penalty 4. Left Wing

7. Slate : Pencil Book : ?

1. Pen 2. Eraser 3. Scale 4. Compass

8. Bone : Skeleton Blood : ?

1. Eye 2. Ear 3. Vein 4. Skin

9. Circle : Circumference Square : ?

1. Width 2. Area 3. Length 4. Perimeter

10. Video : Cassette Computer : ?

1. Recording

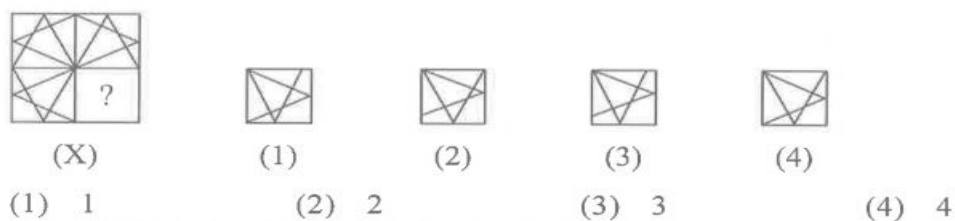
2. File

3. Floppy

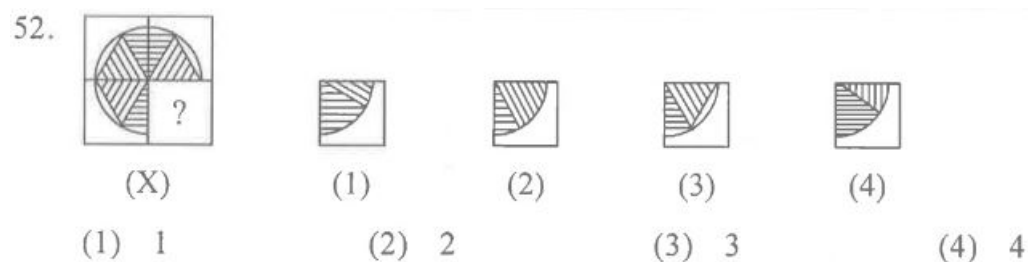
4. CD

Complete the pattern

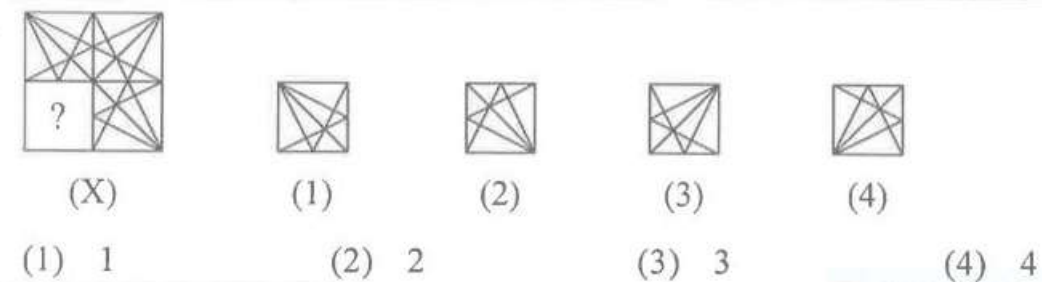
11.



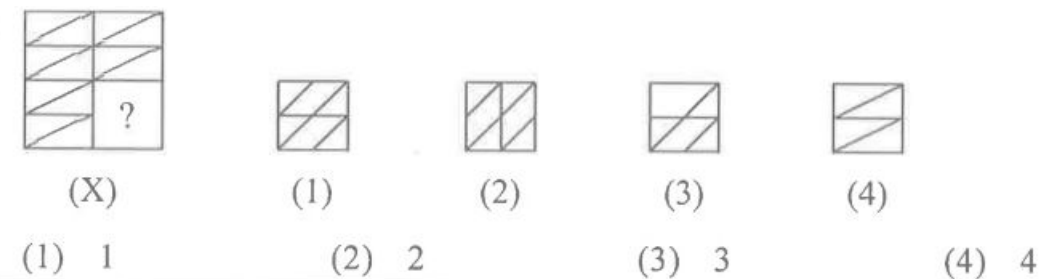
12.



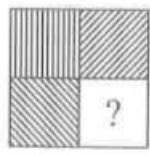
13.



14.



15.



(X)

(1) 1



(1)

(2) 2



(2)



(3)

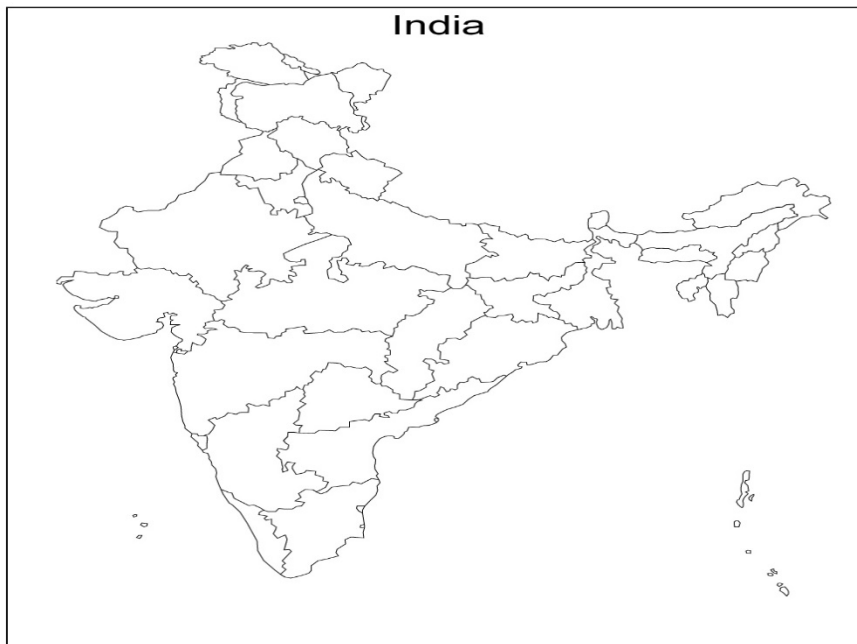
(3) 3



(4)

(4) 4

Find the answers to the following questions and mark them on the map



16. Mark the state where the Taj Mahal is located.

17. Mark the state where the Ooty hill station is located.

18. Mark the state that receives the highest rainfall.

19. Mark the most recently formed state in India.

20. Mark the state where the Sabarmati Ashram is located.

21. Find the words given below.

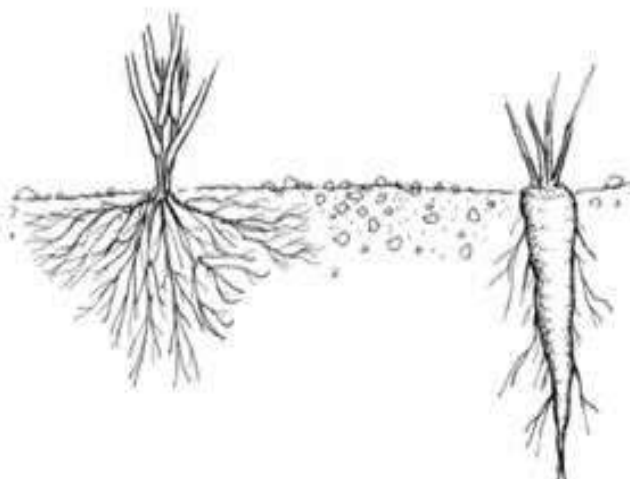


Haploid
Homeostasis
Lysosome
Meiosis
Microtubules
Mitochondria
Mitosis
Motility
Nucleus
Organelle
Osmosis
Phage
Plastid
Prokaryotic
Protist
Respiration
Ribosome
Tissue
Vacuole
Vesicle

22. Match the pairs

Reserved Forests	Forests and wastelands owned by the government, private individuals, and communities
Protected Forests	Such forests are considered the most valuable in terms of the conservation of forest and wildlife resources
Unclassified Forests	Type of forest land that is protected from excessive exploitation

23. Observe the roots of the plant shown in the picture below and draw its stems.

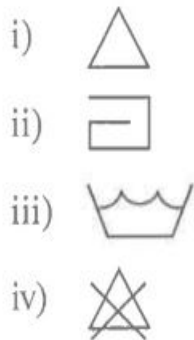


24. Match the pairs

കവാടം =
മിഴി =
പർവതം =
മാർഗം =
മലിനം =
പ്രപഞ്ചം =
ശൃംഖല =
ദൃശ്യം =
ദൃഷ്ടിതം =
കർശനം =

കുന്ന്
ലോകം
വാതിൽ
ചങ്ങല
കാഴ്ച
വഴി
നിബന്ധം
അഴുക്ക്
കണ്ണ്
ചിത്തയായ

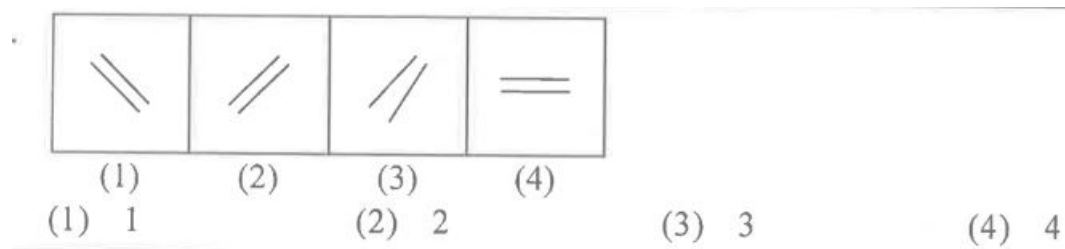
25. Match the pairs



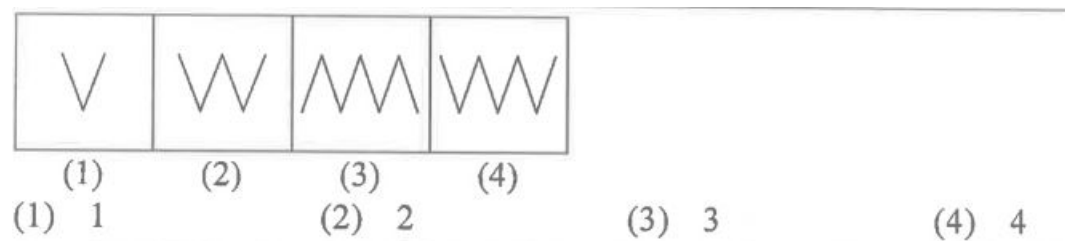
- a) Wash
b) Bleach
c) Iron
d) Do not bleach

Out of these four pictures, three are similar in a particular way. Choose the one that is different from the rest.

26.



27.

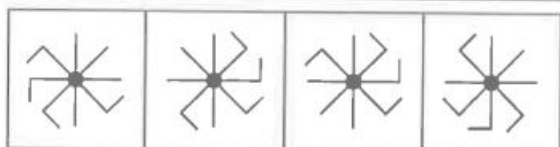


28.



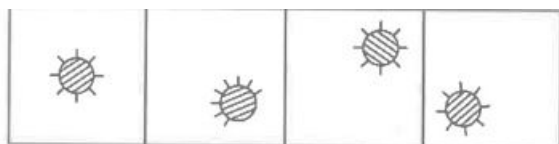
(1) 1 (2) 2 (3) 3 (4) 4

29.



(1) 1 (2) 2 (3) 3 (4) 4

30.



(1) 1 (2) 2 (3) 3 (4) 4

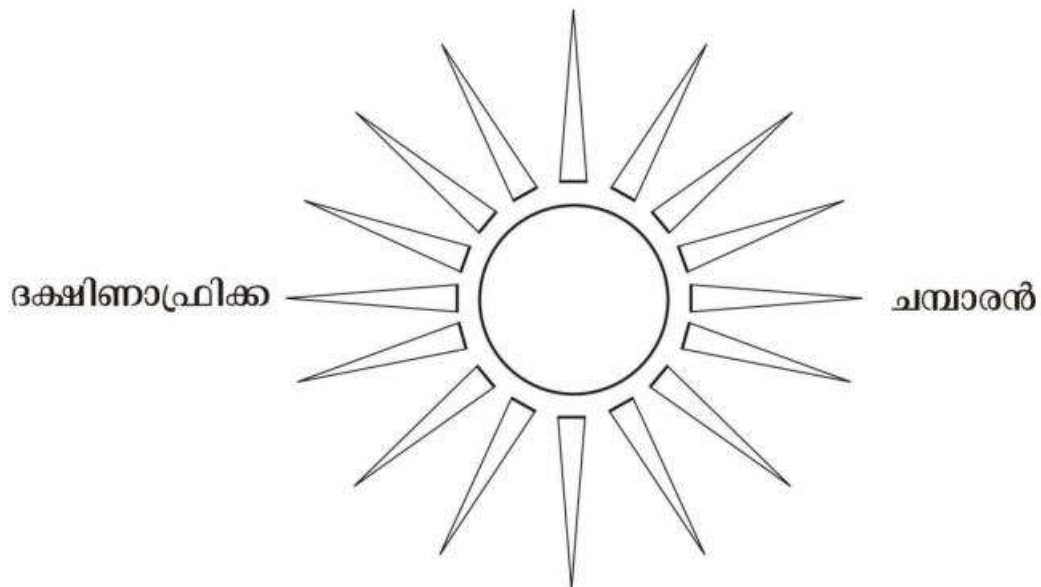
31. The process of withdrawing money from an ATM is shown below. Arrange these pictures in the correct order.



32. Write what the traffic signal shown below indicates.

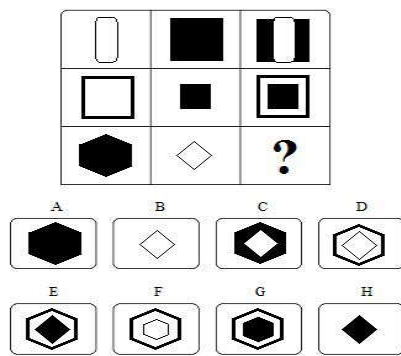


33 Expand the mind map related to APJ Abdul Kalam.

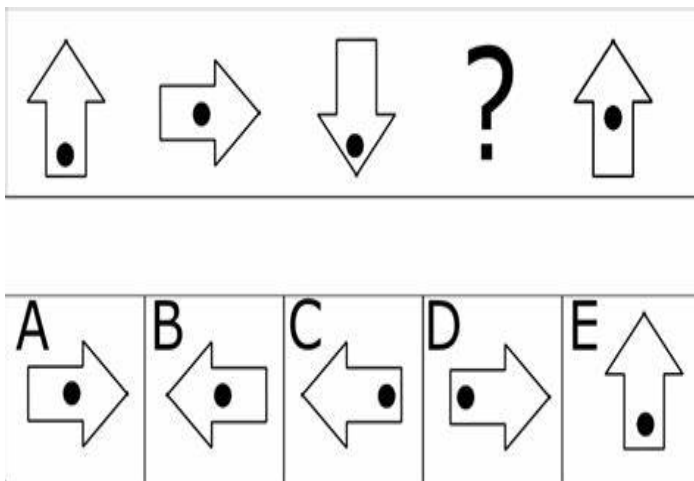


Complete the pattern given below

34.



35.



Annexure J

TOOL FOR TEACHER'S RELATIONSHIP WITH CHILDREN

Part A: Structured Questionnaire

Instructions:

Please read each statement carefully and select the option that best represents how frequently you practice the activity.

Use the following response categories:

3 – Constantly 2 – Occasionally 1 – Not at all

PART A:

i. Teachers Relationship with Children

1. Are records prepared and maintained containing comprehensive information about children (health, social, economic background etc.)?

Constantly	
Occasionally	
Not at all	

2. Are the academic merits, learning achievements etc. of each child individually prepared and communicated to the child, parents etc.?

Constantly	
Occasionally	
Not at all	

3. Unique activities are identified and implemented for children in need of support. Is it possible to ensure the participation of all children in the activities?

Constantly	
Occasionally	
Not at all	

4. Are the interventions necessary to identify and develop children's artistic/sports creative abilities?

Constantly	
Occasionally	
Not at all	

5. Parents can give an accurate idea about the learning status of each child. The strategy adopted for it (WhatsApp group, directly, others)

Constantly	
Occasionally	
Not at all	

6. Is it possible to participate in various art programs and perform with the participation of parents to develop creative skills in students?

Constantly	
Occasionally	
Not at all	

7. Are study trips organized in schools along with classroom studies related to the detailed study topic?

Constantly	
Occasionally	
Not at all	

8. Does the curriculum include new things in the field of information technology communication for children related to computer learning?

Constantly	
Occasionally	
Not at all	

9. Do regular class breaks include short games to entertain children?

Constantly	
Occasionally	
Not at all	

10. Are science and literature fairs organized for children?

Constantly	
Occasionally	
Not at all	

11. Does the formation of different types of science, literature and nature clubs encourage leadership behaviour and ensure participation in children?

Constantly	
Occasionally	
Not at all	

12. Are the students encouraged by handing out incentives like medals to represent their academic performance?

Constantly	
Occasionally	
Not at all	

13. Do children and their parents are brought together to discuss the level of learning?

Constantly	
Occasionally	
Not at all	

14. Are backward students selected and organized into special classes?

Constantly	
Occasionally	
Not at all	

15. Are study materials distributed to poor students in new academic years?

Constantly	
Occasionally	
Not at all	

Part B: Open-Ended Questions

Category I: Relationship with Children

Dimension 1: Record Keeping & Monitoring

1. How do you maintain records about each child's academic progress and personal background?
2. What kind of information do you usually record about a child (health, social, or learning-related)?
3. How does record-keeping help you understand individual student needs better?

Dimension 2: Individualized Attention & Inclusion

4. How do you identify students who require individual attention or remedial support?
5. What strategies do you use to include children with different learning levels in classroom activities?
6. How do you make sure that shy or less confident students actively participate in lessons?

Dimension 3: Holistic Development

7. How does your school promote children's creative and artistic abilities?
8. What importance do you give to sports, cultural events, or art in your teaching plan?
9. Can you share an example of a program or activity that enhanced students' creativity or teamwork?

Dimension 4: Parent-Teacher Collaboration

10. How do you communicate student progress or challenges to parents?
11. How often do you meet or interact with parents formally or informally?
12. Can you describe a case where working closely with a parent improved a student's learning or behavior?

Dimension 5: Experiential Learning

13. How do you use field trips or practical experiences to make lessons more meaningful?
14. Can you describe a classroom activity where students learned best through hands-on experience?
15. How do you integrate play-based or project-based learning in your lessons?

Dimension 6: Access & Equity

16. What measures does your school take to support economically disadvantaged children?
17. How do you ensure equal learning opportunities for children from different social or linguistic backgrounds?
18. What steps are taken to prevent discrimination or exclusion in your classroom?

Dimension 7: ICT Integration

19. How do you integrate digital tools or ICT into daily classroom teaching?
20. What kind of ICT-based activities do students enjoy or benefit from most?
21. How has technology changed the way you assess or engage students?

Malayalam

അധ്യാപകരുടെയും കുട്ടികളുടെയും ബന്ധം

1. കുട്ടികളെക്കുറിച്ചുള്ള (ആരോഗ്യം, സാമൂഹികം, സാമ്പത്തിക പശ്ചാത്തലം തുടങ്ങിയ) സമഗ്രമായ വിവരങ്ങൾ ഉൾക്കൊള്ളുന്ന രേഖകൾ തയ്യാറാക്കി സൂക്ഷിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
2. ഓരോ കുട്ടിയുടെയും അക്കാദമിക് കഴിവുകളും പഠന നേട്ടങ്ങളും പ്രത്യേകം തയ്യാറാക്കി കുട്ടിക്കും രക്ഷിതാക്കൾക്കും അറിയിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
3. സഹായം ആവശ്യമുള്ള കുട്ടികൾക്കായി പ്രത്യേക പ്രവർത്തനങ്ങൾ കണ്ടെത്തി നടപ്പാക്കുന്നുണ്ടോ? എല്ലാ കുട്ടികളുടെയും പങ്കാളിത്തം ഉറപ്പാക്കാൻ കഴിയുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
4. കുട്ടികളുടെ കലാ/കായിക/സ്രഷ്ടിപരമായ കഴിവുകൾ കണ്ടെത്താനും വികസിപ്പിക്കാനും ആവശ്യമായ ഇടപെടലുകൾ സംഘടിപ്പിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല

5. ഓരോ കുട്ടിയുടെയും പഠനനിലയെക്കുറിച്ച് രക്ഷിതാക്കൾക്ക് വ്യക്തമായ ധാരണ ലഭിക്കുന്നതിനായി (വാട്സ്ആപ്പ് ഗ്രൂപ്പ്, നേരിട്ടുള്ള കൂടിക്കാഴ്ച, മറ്റ് മാർഗങ്ങൾ) പോലുള്ള തന്ത്രങ്ങൾ ഉപയോഗിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
6. വിദ്യാർത്ഥികളുടെ സൃഷ്ടിപരമായ കഴിവുകൾ വികസിപ്പിക്കുന്നതിനായി രക്ഷിതാക്കളുടെ പങ്കാളിത്തത്തോടുകൂടിയ കലാപരിപാടികളിൽ കുട്ടികൾക്ക് പങ്കെടുക്കാനും അവതരണം നടത്താനും അവസരങ്ങൾ നൽകുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
7. പഠനവിഷയങ്ങളുമായി ബന്ധപ്പെട്ട പഠനയാത്രകൾ സ്കൂളിൽ സംഘടിപ്പിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
8. കമ്പ്യൂട്ടർ പഠനവുമായി ബന്ധപ്പെട്ട പുതിയ വിവരസാങ്കേതികവും ആശയവിനിമയവുമായി ബന്ധപ്പെട്ടതുമായ കാര്യങ്ങൾ പാഠ്യപദ്ധതിയിൽ ഉൾപ്പെടുത്തിയിട്ടുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
9. പതിവ് ക്ലാസ് ഇടവേളകളിൽ കുട്ടികളെ രസിപ്പിക്കുന്ന ചെറിയ കളികൾ ഉൾപ്പെടുത്തുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
10. കുട്ടികൾക്കായി ശാസ്ത്ര-സാഹിത്യ മേളകൾ സംഘടിപ്പിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
11. വിവിധ ശാസ്ത്ര, സാഹിത്യ, നേച്ചർ ക്ലബ്ബുകളുടെ രൂപീകരണം കുട്ടികളിൽ നേതൃസ്വഭാവവും പങ്കാളിത്തവും പ്രോത്സാഹിപ്പിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
12. അക്കാദമിക് പ്രകടനം പരിഗണിച്ച് മെഡൽ പോലുള്ള പ്രോത്സാഹനങ്ങൾ നൽകി വിദ്യാർത്ഥികളെ ഉത്സാഹിപ്പിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
13. കുട്ടികളെയും അവരുടെ രക്ഷിതാക്കളെയും ഒരുമിച്ച് കൊണ്ടുവന്ന് പഠനനിലയെക്കുറിച്ച് ചർച്ച ചെയ്യുന്നതിനുള്ള അവസരങ്ങൾ ഒരുക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
14. പിന്നോക്ക പഠനനിലയിലുള്ള കുട്ടികളെ തെരഞ്ഞെടുത്ത് പ്രത്യേക ക്ലാസുകൾ സംഘടിപ്പിക്കുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല
15. സാമ്പത്തികമായി പിന്നാക്കമുള്ള കുട്ടികൾക്ക് പുതിയ അക്കാദമിക് വർഷത്തിൽ പഠനസാമഗ്രികൾ വിതരണം ചെയ്യുന്നുണ്ടോ? നിരന്തരം / ഇടയ്ക്കിടെ / ഒരിക്കലും ഇല്ല

Part B: തുറന്ന ചോദ്യങ്ങൾ

വിഭാഗം I: കുട്ടികളുമായി ഉള്ള ബന്ധം

Dimension 1: രേഖസംരക്ഷണവും മേൽനോട്ടവും

1. ഓരോ കുട്ടിയുടെയും പഠനപുരോഗതിയും വ്യക്തിപരമായ പശ്ചാത്തലവും എങ്ങനെ രേഖപ്പെടുത്തി സൂക്ഷിക്കുന്നു?
2. ഒരു കുട്ടിയെക്കുറിച്ച് സാധാരണയായി ഏത് തരത്തിലുള്ള വിവരങ്ങളാണ് നിങ്ങൾ രേഖപ്പെടുത്തുന്നത് (ആരോഗ്യം, സാമൂഹികം, പഠനവുമായി ബന്ധപ്പെട്ടത് തുടങ്ങിയവ)?
3. രേഖസംരക്ഷണം വ്യക്തിഗത പഠനാവശ്യങ്ങൾ മനസ്സിലാക്കാൻ എങ്ങനെ സഹായിക്കുന്നു?

Dimension 2: വ്യക്തിഗത ശ്രദ്ധയും ഉൾപ്പെടുത്തലും

4. വ്യക്തിഗത സഹായം ആവശ്യമുള്ള കുട്ടികളെ എങ്ങനെ തിരിച്ചറിയുന്നു?
5. വ്യത്യസ്ത പഠനനിലകളുള്ള കുട്ടികളെ ക്ലാസ് പ്രവർത്തനങ്ങളിൽ ഉൾപ്പെടുത്താൻ നിങ്ങൾ ഉപയോഗിക്കുന്ന തന്ത്രങ്ങൾ ഏവ?

6. ഭയങ്കരമായോ ആത്മവിശ്വാസം കുറവായോ ഉള്ള കുട്ടികൾ സജീവമായി പങ്കെടുക്കാൻ എങ്ങനെ പ്രോത്സാഹിപ്പിക്കുന്നു?

Dimension 3: സമഗ്ര വികസനം

7. കുട്ടികളുടെ സൃഷ്ടിപരമായും കലാപരമായും കഴിവുകൾ പ്രോത്സാഹിപ്പിക്കാൻ നിങ്ങളുടെ സ്കൂൾ എങ്ങനെ പ്രവർത്തിക്കുന്നു?
8. കായികം, സാംസ്കാരിക പരിപാടികൾ, കല തുടങ്ങിയവയ്ക്ക് നിങ്ങളുടെ അധ്യാപനപദ്ധതിയിൽ എത്രത്തോളം പ്രാധാന്യം നൽകുന്നു?
9. വിദ്യാർത്ഥികളുടെ സൃഷ്ടിപരതയോ ടീംവർക്കോ മെച്ചപ്പെടുത്തിയ ഒരു പരിപാടി/പ്രവർത്തനത്തിന്റെ ഉദാഹരണം പങ്കിടാമോ?

Dimension 4: രക്ഷിതാവും അധ്യാപകനും തമ്മിലുള്ള സഹകരണം

10. കുട്ടികളുടെ പഠനപുരോഗതിയും വെല്ലുവിളികളും രക്ഷിതാക്കൾക്ക് എങ്ങനെ അറിയിക്കുന്നു?
11. ഔപചാരികമായും അനുപചാരികമായും രക്ഷിതാക്കളുമായി എത്രത്തോളം ഇടപെടുന്നു?
12. രക്ഷിതാക്കളുമായി അടുത്ത് പ്രവർത്തിച്ചതിലൂടെ ഒരു കുട്ടിയുടെ പഠനമോ പെരുമാറ്റമോ മെച്ചപ്പെട്ട ഒരു ഉദാഹരണം വിവരിക്കാമോ?

Dimension 5: അനുഭവപഠനം

13. ഫീൽഡ് ട്രിപ്പുകളും പ്രായോഗിക അനുഭവങ്ങളും പാഠങ്ങൾ കൂടുതൽ അർത്ഥവത്താക്കാൻ എങ്ങനെ ഉപയോഗിക്കുന്നു?
14. കൈകാര്യം ചെയ്ത് പഠിച്ചപ്പോൾ കുട്ടികൾ ഏറ്റവും നന്നായി മനസ്സിലാക്കിയ ഒരു ക്ലാസ് പ്രവർത്തനം വിശദീകരിക്കാമോ?
15. കളി-ആധാരിതമോ പ്രോജക്ട്-ആധാരിതമോ ആയ പഠനം പാഠങ്ങളിൽ എങ്ങനെ ഉൾപ്പെടുത്തുന്നു?

Dimension 6: അവസരസമത്വം

16. സാമ്പത്തികമായി പിന്നോക്കമുള്ള കുട്ടികളെ പിന്തുണയ്ക്കുന്നതിനായി സ്കൂൾ സ്വീകരിക്കുന്ന നടപടികൾ എന്തൊക്കെയാണ്?
17. വ്യത്യസ്ത സാമൂഹികമോ ഭാഷാപശ്ചാത്തലമോ ഉള്ള കുട്ടികൾക്ക് സമാന പഠനാവസരങ്ങൾ എങ്ങനെ ഉറപ്പാക്കുന്നു?
18. വിവേചനവും പുറത്താക്കലും ഒഴിവാക്കാൻ ക്ലാസിൽ സ്വീകരിക്കുന്ന നടപടികൾ എന്തൊക്കെയാണ്?

Dimension 7: ഐ.സി.ടി. സംയോജനം

19. ഡിജിറ്റൽ ഉപകരണങ്ങളെയും ഐ.സി.ടി.യെയും ദിവസേന ക്ലാസ് അധ്യാപനത്തിൽ എങ്ങനെ ഉൾപ്പെടുത്തുന്നു?
20. കുട്ടികൾക്ക് ഏറ്റവും ഇഷ്ടപ്പെടുന്ന/ലാഭകരമായ ഐ.സി.ടി. പ്രവർത്തനങ്ങൾ ഏവ?
21. സാങ്കേതികവിദ്യ നിങ്ങളുടെ പഠനമൂല്യനിർണ്ണയത്തെയും വിദ്യാർത്ഥികളുമായുള്ള ഇടപെടലിനെയും എങ്ങനെ മാറ്റി?

Appendix K
Learning Quality of Children – Final
(English Version)
Annexure – Tool for Learning Quality of Children (LQC)

PART A – Structured Questions

1. Do you think children in your class have language skills (Malayalam/English/Hindi/Tamil)?
2. Were there children who could write without spelling ideas?
3. Did you have classmates with reading difficulties?
4. Did you have children with reading habits?

PART B – Open-Ended Questions (Six Dimensions)

Dimension 1: Language Proficiency

1. How do you assess students' proficiency in Malayalam, English, or Hindi?
2. What classroom activities help improve speaking, listening, and writing skills?
3. How do you support children struggling with language learning?

Dimension 2: Reading Comprehension

4. How do you improve children's ability to interpret and understand reading material?
5. Which reading materials are most effective?

Dimension 3: Writing & Expressive Skills

6. How do you encourage clear, confident, written expression?
7. What writing tasks support expressive development?

Dimension 4: Intervention Needs

8. How do you identify students requiring prolonged intervention?
9. What support programs do you implement?

Dimension 5: Reading Habits

10. How do you encourage regular reading habits?
11. How do you track reading progress?

Dimension 6: Overall Learning Behaviour

12. How do you observe and assess students' general learning behaviour?

Appendix L
Quality Education LIF
(Final English Version)
QUALITY EDUCATION

INTRODUCTION

We aim to identify the current state of education through scientific analysis, one of the 17 Sustainable Development Goals set forth by the United Nations and formulate actions as part of the intensive effort to ensure quality education for all by 2030.

Achieving the Sustainable Development Goals is a method of achieving these goals at a local level.

In order to achieve the objective of “**Quality Education for all**” mainly eleven components are proposed to be studied.

- Availability (Access)
- Retention
- Inclusion
- Quality Education
- Technology
- Teacher Quality
- Infrastructure
- Monitoring
- Non-formal Education
- Teacher Education
- Implementation of Right to Education Act (RTE Compatibility)

We also aim for the effective coordination of various agencies working in this field with the aim of analysing the current condition of each of these elements and identifying the shortcomings and challenges to overcome them through the local institutions.

1. Education Availability (Access)

Pre-primary/ Anganwadi/ Nursery

1. Are there children in the age group of 3 to 5 who are not enrolled in an early childhood education centre?
2. Are there children who have not been admitted to schools after completing six years of age?

3. Are there children between the ages of 9 and 12 who have not been admitted to class 5?
4. Are the children eligible for higher studies in the SSLC examination of this academic year have enrolled in Higher Secondary / Vocational Higher Secondary Classes?
5. In 2022, have the children who have passed higher secondary been able to get admission into higher education?
6. Higher Secondary / Vocational Higher Secondary Past Current barriers for children to enter higher education?

Marks are minimum	
Is it financial incapacity?	
Is it changed the way to married life?	
Lack of transportation	
Have you moved to work?	
Is it the lack of higher educational institutions?	
Lack of awareness about various courses and job opportunities	
Can't get admission to the course based on interest	

2. Retention

1. Do the children who join the 1st class reach the 5th class?
2. Do the children who join class 1st reach class 8th?
3. Do the children who join class 1 reach class 10?

Key facts that contribute to child dropout at different stages. Tick it as applicable.

Is it Illiteracy of parents and lack of support from home?	
Lack of interest in learning	
Are you afraid of the exam?	
Lack of support from teachers and peers	
Is it family burden?	
Is it economic backwardness?	
Lack of vehicle facilities	
Unattractive school	
Undesirable association	
Anything else	

3. Inclusion

1. Number of differently abled children admitted in schools? (based on the major categories they belong to)

SI	
HI	
VI	
OH	
Others	

- (a) Special supports available to these categories [Applicable {Tick}]

	Effective	Partially	Inadequate
Service of resource teacher			
Adaptation in learning activity			
Travel facilitation support			
Availability of assistive devices			

- (b) Are there people with disabilities who aren't admitted in schools?
- (c) Are there children who have been admitted but are unable to attend classes consistently?
- (d) Are there receiving any home-based education among them?

2. Are there students who are children of guest workers?
3. Strategies adopted to bridge language gaps of students of tribal people [tick applicable]

Mentor's presence	
Use of relational language materials	

4. Strategies conducted to ensure attendance of tribal students [tick the applicable]

Provision of passenger vehicle	
Provision of hostel facility	

5. Are there girls enrolled in higher education after Plus Two education?
6. Are there any girls who drop out after Plus Two education?
7. Strategies adopted to mainstream backward learners (tick as applicable)

Interviews	
Guest classes field trips	
Workshops	
Motivation classes	

4. Quality Education

(i) Relationship with Children

1. Are records prepared and maintained containing comprehensive information about children (health, social, economic background etc.)?

Constantly	
Occasionally	
Not at all	

2. Are the academic merits, learning achievements etc. of each child individually prepared and communicated to the child, parents etc.?

Constantly	
Occasionally	
Not at all	

3. Unique activities are identified and implemented for children in need of support. Is it possible to ensure the participation of all children in the activities?

Constantly	
Occasionally	
Not at all	

4. Are the interventions necessary to identify and develop children's artistic/sports creative abilities?

Constantly	
Occasionally	
Not at all	

5. Parents can give an accurate idea about the learning status of each child. The strategy adopted for it (WhatsApp group, directly, others)

Constantly	
Occasionally	
Not at all	

6. Is it possible to participate in various art programs and perform with the participation of parents to develop creative skills in students?

Constantly	
Occasionally	
Not at all	

7. Are study trips organized in schools along with classroom studies related to the detailed study topic?

Constantly	
Occasionally	
Not at all	

8. Does the curriculum include new things in the field of information technology communication for children related to computer learning?

Constantly	
Occasionally	
Not at all	

9. Do regular class breaks include short games to entertain children?

Constantly	
Occasionally	
Not at all	

10. Are science and literature fairs organized for children?

Constantly	
Occasionally	
Not at all	

11. Does the formation of different types of science, literature and nature clubs encourage leadership behaviour and ensure participation in children?

Constantly	
Occasionally	
Not at all	

12. Are the students encouraged by handing out incentives like medals to represent their academic performance?

Constantly	
Occasionally	
Not at all	

13. Do children and their parents are brought together to discuss the level of learning?

Constantly	
Occasionally	

Not at all	
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14. Are backward students selected and organized into special classes?

Constantly	
Occasionally	
Not at all	

15. Are study materials distributed to poor students in new academic years?

Constantly	
Occasionally	
Not at all	

(ii) Learning Quality of Children

1. Do children have language skills?

Malayalam	
English	
Hindi	
Tamil	

2. Are there children who have the ability to write without spelling ideas?
3. Has it been possible to improve children's language skills with short-term intervention?
4. Are there children who require prolonged intervention?
5. Are there children who still need to improve their reading comprehension?
6. Do you have children with reading difficulties?
7. Are children capable of writing a subject containing sentences about a topic from the child's experience?
8. Do you have children with reading habits?
9. Are there children who do not know how to write lowercase letters and consonants?
10. Do children have the ability to write personal information?
11. Are there people who write things in the form of notes on what they understand from children's reading?
12. Do you have children who make it a habit of daily newspaper reading and jotting down important things in the book?
13. Are there children who visit the library during holidays and keep notes regarding their favourite books?
14. Are there children who can write and read the entire alphabet in Malayalam?
15. Have children who can read and write the English alphabet?
16. Have children who can read and write Hindi alphabet sequences?

(iii) Mathematical Ability (Std III & IV)

1. Have children who struggle with addition and subtraction of three-digit numbers?
2. Do you have children who struggle with multiplication and division of three-digit numbers?
3. Are there children who have difficulty in analysing problem solving questions and convincing themselves which quadrants are in them?
4. Have children who do not know what units are?

Units	Count	Percent
Distance: meter, centimeter		
Time: second, hour		
Contents: liters, milli liters		
Weight: kilograms, grams		

5. Are there children who have difficult to draw a line with a certain degree of accuracy using a scale?
6. Are there children who have difficulty in correctly saying the place value of the digits in a three-digit number?

(iv) Life Skills

1. I can judge myself whether some of my own behaviour was appropriate to the situation.

Constantly	
Occasionally	
Not at all	

2. Due to the lightning strike, the bus may not be available, so it may be late to reach home. I can find the necessary way to deal with this adverse situation.

Constantly	
Occasionally	
Not at all	

3. Unbeknownst to the family, the sincere friend insists on skipping class and going on a trip. I can choose not to participate and at the same time not upset my friend

Constantly	
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Occasionally	
Not at all	

4. I can make household items or curiosities by collecting waste materials that are dumped on the ground and cause pollution.

Constantly	
Occasionally	
Not at all	

5. I can scientifically find whether the tea powder purchased at my home is adulterated.

Constantly	
Occasionally	
Not at all	

6. I am able to critically analyse different newspaper reports about the same event

Constantly	
Occasionally	
Not at all	

7. I am able to discern truth and falsehood by judiciously discerning the information available through social media.

Constantly	
Occasionally	
Not at all	

8. I am able to distinguish between essential and mere luxuries in my family's monthly expenses

Constantly	
Occasionally	
Not at all	

9. If I meet strangers on the way to school, I am reluctant to engage in quick friendly conversation with them and may turn away and walk away.

Constantly	
Occasionally	
Not at all	

10. I can start awareness from my own home and do my own interventions in rural areas to reduce drug use.

Constantly	
Occasionally	
Not at all	

11. I celebrate and I feel proud of my friend's victory celebration.

Constantly	
Occasionally	
Not at all	

12. On my way to school, if an accident happens unexpectedly in front of my eyes, I can intervene and do what I need to do.

Constantly	
Occasionally	
Not at all	

13. I can help older people to cross the road on their way to school

Constantly	
Occasionally	
Not at all	

14. I also take part in keeping my house and surroundings clean and tidy

Constantly	
Occasionally	
Not at all	

15. I am able to participate in various clubs that are working in schools and implement activities

Constantly	
Occasionally	
Not at all	

5. **Information Technology**

1. Are there Pre-primary classrooms with smart classrooms available?
2. Are there lower primary classes with smart classrooms available?
3. Are there upper primary classes with smart classrooms available (UP)?
4. Are there high school classes with smart classrooms available?
5. Are there Higher Secondary Classes having Smart Classroom available?
6. Are teachers taking advantage of blended learning opportunities?
7. Do children get computer study daily?

8. On an average in a month, 9th class students have availed the online facility from the school?
9. Are there teachers using educational software availability as part of classroom learning [GeoGebra]?
10. Tinkering lab - 3D printing - Use of technology - Are there schools available for children?

6. Teacher Quality

1. Number of teachers working at various levels

Levels	Total	Available	Percent
Pre primary			
Lower Primary			
Upper Primary			
High School			
Higher Secondary			

2. Number of teachers not properly attending in-service trainings

Levels	Total
Pre primary	
Lower Primary	
Upper Primary	
High School	
Higher Secondary	

3. Number of qualified than proposed for the present post

Levels	Total
Pre primary	
Lower Primary	
Upper Primary	
High School	
Higher Secondary	

4. Number of teachers participating in seminars, workshops etc. as part of professional development

Levels	Numbers
Pre primary	
Lower Primary	
Upper Primary	
High School	
Higher Secondary	

5. Professional skill development of teachers

	Pre primary	LP	UP	HS	HSS
Number of teachers capable of using modern technology effectively					
Number of teachers who have received recognitions for various operational excellence					
Number of teachers who have/are doing further studies after joining the service					
Number of teachers who have undertaken/conducted research activities for problem solving					

7. **Infrastructure Facilities**

This is a questionnaire to assess physical academic facilities in educational institutions. Necessary entries will be made in the columns. Data collection should be done through direct observation and interaction with school authorities.

(i) **Pre-primary**

1. Are there child-friendly classrooms?
2. Are there enough furnished classrooms?
3. Is child-friendly furniture available?
4. Are there classrooms with wall pictures, painting etc.?
5. Are there classrooms with panels of pictures of animals, birds, flowers, butterflies etc.?
6. Are there schools with activity corner?
7. Is there child friendly play equipment?
8. Are there classrooms with electricity, fan and light facilities?
9. Are there classrooms with ventilated windows?
10. Is there a specific size classroom?
11. Are there facilities for rest and sleep?
12. Is there a child friendly toilet?

13. Do schools have gates around them?
14. Are there facilities for differently abled children?

(ii) Curricular and Extra-curricular Facilities

1. Are there any schools where government prescribed textbooks are available?
2. Are children's literature available in schools?
3. Are there recreational facilities?
4. Is there light exercise equipment?
5. Are there baby-friendly toys?

(iii) Digital Technology Facilities

1. Are there lap tops, projectors?
2. Have educational entertainment / CD, DVD?
3. Are there any facilities to play audio songs?

(iv) Food and Water

	Satisfied	Average	Need to improve	No
Breakfast				
Lunch				
Drinking water				
Other nutrition plans				

(v) Environment Cleanliness

1. Are there clean class rooms?
2. Is equipment, furniture, etc. are kept clean?
3. Have a clean premises and yard?
4. Is there a play area?
5. Is there a garden?
6. Are there clean toilets?

(vi) Primary, High School, Higher Secondary School

1. Is there a place as prescribed by the government?
2. Is there a play area?
3. Is there a dedicated court system for specific games?
4. Is there a surrounding wall?
5. Is the gate admission student friendly?

(vii) Buildings

1. Are there safe classrooms?
2. Are there separate staff rooms for teachers?
3. Are there separate staff rooms for male and female teachers?
4. Is the office in separate rooms?
5. Does the library have a separate room?
6. Do laboratories have a separate room?
7. Are there classrooms designed to be child friendly?
8. Is there a study friendly compound?
9. Is there a rest room?
10. Is there a counselling room?
11. Is there a ramp for differently abled children?

(viii) Lunch

1. Is the kitchen safe and equipped?
2. Is dining hall available for students to have meals?
3. Are utensils and glasses available in schools?
4. Are there hand and dish washing facilities?
5. Is there waste management facility?
6. Is there a store room?
7. Has drinking water facility been arranged at required places?

(ix) Cleanliness

1. Are there adequate washrooms for teachers and staff?
2. Are there adequate toilets for children?
3. Are there separate washrooms for girls?
4. Is there incinerator facility?
5. Are there buildings and premises completely clean?
6. Are there adapted toilet facilities for differently abled children?

(x) Books

1. Are books available to all students?
2. Are teachers handbooks and other references available in schools?
3. Does the library have the necessary books?
4. Are there required books in the class library?

(xi) Equipment for Lab, Study and Play

1. Is there necessary equipment in various laboratories?
2. Are there any other study materials required?
3. Are there class labs?

4. Are there sports equipment?

(xii) Technology ICT

1. Are there laptops in all classrooms?
2. Does every class have a projector?
3. Is there a necessary computer printer in the office?
4. Is there a laptop projector in the common hall?
5. Is there internet facility in the office?
6. Are there internet digital board in classrooms?
7. Is there a Public Address System?

(xiii) Furniture

1. Is there sufficient furniture availability in the office?
2. Is there sufficient furniture available in the classrooms?
3. Are there child-friendly seats in smaller classes?

8. Monitoring

1. Is there monitoring of head teachers?
2. Is there monitoring by Education Officers?
3. Does society evaluate schools?
4. Is there monitoring of Local Self-Government Institutions?
5. Do children evaluate teachers in the institution?
6. Does inter-institutional peer review twinning take place?
7. Are you utilising a live support system?

Monitoring- making some statements about effectiveness check rate

1. Is there monitoring of head teachers?
2. Is there monitoring by Education Officers?
3. Are schools subjected to social evaluation?
4. Is the educational Monitoring of Local Self-Government Bodies going on?
5. Are there some factors localizing teachers by which children evaluate them?
6. Is twinning method used for mutual evaluation between institutions?
7. Is there a live support system?

9. Non- Formal Education

1. Are there any literate youth in the age group of 15-24?
2. Are there computer literate youth?
3. Are there people studying in vocational education institutions?

4. Has anyone acquired additional educational qualifications after 50 years of age?
5. Are there people who have continued their education even after getting a job?
6. Are there people who have made a mark in particular fields (Agriculture, Industry, Literature etc)?
7. Are there any distinguished honourees/recognitions?
8. Are Continuing Literacy Centres functioning?
9. Are there any wards without further literacy centres?
10. Are there sufficient facilitators in continuing literacy centres?
11. Details of Equivalency Examination held in last 3 years

	Class	Registered	Winners
2020-21	4		
	7		
	10		
	12		

	Class	Registered	Winners
2021-22	4		
	7		
	10		
	12		

	Class	Registered	Winners
2022-23	4		
	7		
	10		
	12		

10. Teacher Education

1. Number of recognized Teacher Education Centres

	Govt	Aided	Unaided
Pre primary			
Primary (D.El.Ed)			
Secondary (B.Ed)			

2. Number of student teachers studying in recognized institutions

	Govt	Aided	Unaided
Pre primary			
Primary (D.El.Ed)			

Secondary (B.Ed)			
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3. Institutions which have ensured physical facilities as prescribed by the government for Teacher Training Centres

	Govt	Aided	Unaided
Pre primary			
Primary (D.El.Ed)			
Secondary (B.Ed)			

4. Number of Teacher Trainers with prescribed qualifications prescribed by the Government in teacher training institutes

	Total Teachers			Those without prescribed qualifications		
	Govt	Aided	Unaided	Govt	Aided	Unaided
Pre primary						
Primary						
Secondary						

11. Implementation of the Right to Education Act (Right to Education Compatibility)

1. Is there a lower primary education facility available within one kilo meter radius?
2. Is there an upper primary school facility within 3 km radius?
3. Is there a high school facility within 5 km radius?
4. Has the vehicle facility been ensured for the children who do not have access to study facilities within the specified distance?
5. Schools with laboratory and library facilities as prescribed by Right to Education Act in schools (LP, UP, HS, HSS)
6. Is play equipment available for all children?
7. Is it possible for any child to attend school on any working day in 2 years without any written requirements?
8. Is there a mechanism for children to make complaints in a way that ensures independence and privacy? (Example – Complaint Box)

QUALITY EDUCATION

PUDUR SCHOOL

LP – 4/7

UP – 4/6

HS – 13/20

HSS – 8/8

Total - 29

SHOLAYOOR SCHOOL

LP – 3/6

UP – 5/6

HS – 6/8

HSS – 11/16

Total – 25

KOTTATHARA SCHOOL

UP – 6/9

Total – 6

AGALI SCHOOL

LP – 11/14

UP – 15/21

HS – 17/21

Total – 43

UNNATHI

17/18

Total – 17

Total number of teachers – 147

Responses received – 120 (82 %)

Appendix M
Quality Education LIF – Final
(Malayalam Version)

ഗുണനിലവാരമുള്ള വിദ്യാഭ്യാസം

ആമുഖം

ഐക്യരാഷ്ട്രസഭ മുന്നോട്ടുവച്ച 17 സുസ്ഥിര വികസന ലക്ഷ്യങ്ങളിലൊന്നായ ശാസ്ത്രീയ വിശകലനത്തിലൂടെ വിദ്യാഭ്യാസത്തിന്റെ നിലവിലെ അവസ്ഥ തിരിച്ചറിയാനും 2030 ഓടെ എല്ലാവർക്കും ഗുണനിലവാരമുള്ള വിദ്യാഭ്യാസം ഉറപ്പാക്കാനുള്ള തീവ്ര ശ്രമത്തിന്റെ ഭാഗമായി നടപടികൾ ആവിഷ്കരിക്കാനും ഞങ്ങൾ ലക്ഷ്യമിടുന്നു.

സുസ്ഥിര വികസന ലക്ഷ്യങ്ങള് കൈവരിക്കുക എന്നത് പ്രാദേശിക തലത്തിൽ ഈ ലക്ഷ്യങ്ങള് കൈവരിക്കുന്നതിനുള്ള ഒരു രീതിയാണ്.

"എല്ലാവർക്കും ഗുണനിലവാരമുള്ള വിദ്യാഭ്യാസം" എന്ന ലക്ഷ്യം കൈവരിക്കുന്നതിന് പ്രധാനമായും പതിനൊന്ന് ഘടകങ്ങൾ പഠിക്കാൻ നിർദ്ദേശിക്കുന്നു.

- ലഭ്യത (Access)
- നിലനിർത്തൽ (Retention)
- ഉൾപ്പെടുത്തൽ (Inclusion)
- ഗുണനിലവാരമുള്ള വിദ്യാഭ്യാസം (Quality Education)
- സാങ്കേതികവിദ്യ (Technology)
- അധ്യാപകന്റെ ഗുണനിലവാരം (Teacher Quality)
- അടിസ്ഥാന സൗകര്യങ്ങൾ (Infrastructure)
- നിരീക്ഷണം (Monitoring)
- അനൗപചാരിക വിദ്യാഭ്യാസം (Non-formal Education)
- അധ്യാപക വിദ്യാഭ്യാസം (Teacher Education)
- വിദ്യാഭ്യാസ അവകാശ നിയമം (RTE Compatibility) നടപ്പാക്കൽ

ഈ ഓരോ ഘടകത്തിന്റെയും നിലവിലെ അവസ്ഥ വിശകലനം ചെയ്യുകയും പ്രാദേശിക സ്ഥാപനങ്ങളിലൂടെ അവ മറികടക്കാനുള്ള പോരായ്മകളും വെല്ലുവിളികളും തിരിച്ചറിയുകയും ചെയ്യുക എന്ന ലക്ഷ്യത്തോടെ ഈ രംഗത്ത് പ്രവർത്തിക്കുന്ന വിവിധ ഏജൻസികളുടെ ഫലപ്രദമായ ഏകോപനവും ഞങ്ങൾ ലക്ഷ്യമിടുന്നു.

1. വിദ്യാഭ്യാസ ലഭ്യത (Access)

പ്രീ-പ്രൈമറി/ അങ്കണവാടി/ നൂറു

1. 3 മുതൽ 5 വയസ്സുവരെയുള്ള കുട്ടികൾ ഒരു ബാല്യകാല വിദ്യാഭ്യാസ കേന്ദ്രത്തിൽ ചേരാത്തവരുണ്ടോ?
2. ആറ് വയസ്സ് കഴിഞ്ഞിട്ടും സ്കൂളിൽ പ്രവേശനം ലഭിക്കാത്ത കുട്ടികളുണ്ടോ?
3. 9 നും 12 നും ഇടയിൽ പ്രായമുള്ള കുട്ടികൾ അഞ്ചാം ക്ലാസ്സിൽ പ്രവേശനം ലഭിക്കാത്തവരുണ്ടോ?
4. ഈ അധ്യയന വർഷത്തെ SSLC പരീക്ഷയിൽ ഉപരിപഠനത്തിന് അർഹരായ കുട്ടികൾ ഹയർ സെക്കൻഡറി / വൊക്കേഷണൽ ഹയർ സെക്കൻഡറി ക്ലാസുകളിൽ ചേർന്നിട്ടുണ്ടോ?
5. 2022-ൽ ഹയർസെക്കൻഡറി പാസായ കുട്ടികൾക്ക് ഉന്നതവിദ്യാഭ്യാസത്തിന് പ്രവേശനം ലഭിച്ചിട്ടുണ്ടോ?
6. ഹയർ സെക്കണ്ടറി / വൊക്കേഷണൽ ഹയർ സെക്കണ്ടറി കഴിഞ്ഞ കുട്ടികൾക്ക് ഉന്നത വിദ്യാഭ്യാസത്തിൽ പ്രവേശിക്കുന്നതിന് നിലവിലുള്ള തടസ്സങ്ങൾ?

മാർക്ക് കുറഞ്ഞത്	
സാമ്പത്തിക ശേഷിയില്ലായ്മയാണോ?	
വിവാഹ ജീവിതത്തിലേക്കുള്ള വഴി മാറിയോ?	
ഗതാഗതത്തിന്റെ അഭാവം	
നിങ്ങൾ ജോലിക്ക് മാറിയോ?	
ഉന്നത വിദ്യാഭ്യാസ സ്ഥാപനങ്ങളുടെ കുറവായോ?	
വിവിധ കോഴ്സുകളെക്കുറിച്ചും തൊഴിലവസരങ്ങളെക്കുറിച്ചും അവബോധമില്ലായ്മ	
താൽപ്പര്യത്തിന്റെ അടിസ്ഥാനത്തിൽ കോഴ്സിലേക്ക് പ്രവേശനം നേടാനാവില്ല	

2. നിലനിർത്തൽ

1. ഒന്നാം ക്ലാസിൽ ചേരുന്ന കുട്ടികൾ അഞ്ചാം ക്ലാസിൽ എത്തുമോ?
2. ഒന്നാം ക്ലാസിൽ ചേരുന്ന കുട്ടികൾ എട്ടാം ക്ലാസിൽ എത്തുമോ?

3. ഒന്നാം ക്ലാസ്സിൽ ചേരുന്ന കുട്ടികൾ പത്താം ക്ലാസ്സിൽ എത്തുന്നുണ്ടോ?

വിവിധ ഘട്ടങ്ങളിൽ കുട്ടികളുടെ കൊഴിഞ്ഞുപോകിന് കാരണമാകുന്ന പ്രധാന വസ്തുതകൾ. ഇത് ബാധകമായ രീതിയിൽ ടിക്ക് ചെയ്യുക.

മാതാപിതാക്കളുടെ നിരക്ഷരതയും വീട്ടിൽ നിന്നുള്ള പിന്തുണയില്ലായ്മയും ആണോ?	
പഠിക്കാനുള്ള താൽപര്യക്കുറവ്	
പരീക്ഷയെ പേടിയാണോ?	
അധ്യാപകരുടെയും സഹപാഠികളുടെയും പിന്തുണയുടെ അഭാവം	
കുടുംബഭാരമാണോ?	
സാമ്പത്തിക പിന്നാക്കാവസ്ഥയാണോ?	
വാഹന സൗകര്യങ്ങളുടെ അഭാവം	
ആകർഷകമല്ലാത്ത സ്കൂൾ	
അഭികാമ്യമല്ലാത്ത കൂട്ടുകെട്ട്	
മറ്റെന്തെങ്കിലും	

3. ഉൾപ്പെടുത്തൽ

1. സ്കൂളുകളിൽ പ്രവേശനം നേടിയ ഭിന്നശേഷിയുള്ള കുട്ടികളുടെ എണ്ണം? (അവർ ഉൾപ്പെടുന്ന പ്രധാന വിഭാഗങ്ങളെ അടിസ്ഥാനമാക്കി)

SI	
HI	
VI	
OH	
Others	

(a) ഈ വിഭാഗങ്ങൾക്ക് ലഭ്യമായ പ്രത്യേക പിന്തുണകൾ [ബാധകമായ {Tick}]

	ഫലപ്രദം	ഭാഗികമായി	അപര്യാപ്തം
റിസോഴ്സ് ടീച്ചറുടെ സേവനം			
പഠന പ്രവർത്തനത്തിലെ പൊരുത്തപ്പെടുത്തൽ			
യാത്രാ സൗകര്യം പിന്തുണ			
സഹായ ഉപകരണങ്ങളുടെ ലഭ്യത			

(b) സ്കൂളുകളിൽ പ്രവേശനം ലഭിക്കാത്ത ഭിന്നശേഷിക്കാർ ഉണ്ടോ?

(c) പ്രവേശനം ലഭിച്ചിട്ടും സ്ഥിരമായി ക്ലാസുകളിൽ പങ്കെടുക്കാൻ കഴിയാത്ത കുട്ടികളുണ്ടോ?

(d) അവർ കിടയിൽ ഭവനാധിഷ്ഠിത വിദ്യാഭ്യാസം ലഭിക്കുന്നുണ്ടോ?

2. അതിഥി തൊഴിലാളികളുടെ മക്കളായ വിദ്യാർത്ഥികൾ ഉണ്ടോ?

3. ഗോത്രവർഗ വിദ്യാർത്ഥികളുടെ ഭാഷാ വിടവുകൾ നികത്താൻ സ്വീകരിച്ച തന്ത്രങ്ങൾ [ടിക്ക് ബാധകമാണ്]

ഉപദേശാവിന്റെ സാന്നിധ്യം	
റിലേഷണൽ ലാംഗ്വേജ് മെറ്റീരിയലുകളുടെ ഉപയോഗം	

4. ആദിവാസി വിദ്യാർത്ഥികളുടെ ഹാജർ ഉറപ്പാക്കാൻ നടത്തിയ തന്ത്രങ്ങൾ [ബാധകമായ ടിക്ക്]

യാത്രാ വാഹനത്തിന്റെ ക്രമീകരണം	
ഹോസ്റ്റൽ സൗകര്യം ഏർപ്പെടുത്തുക	

5. പ്ലസ് ടു വിദ്യാഭ്യാസത്തിന് ശേഷം പെൺകുട്ടികൾ ഉന്നത വിദ്യാഭ്യാസത്തിന് ചേർന്നിട്ടുണ്ടോ?

6. പ്ലസ് ടു വിദ്യാഭ്യാസത്തിന് ശേഷം പഠനം ഉപേക്ഷിക്കുന്ന ഏതെങ്കിലും പെൺകുട്ടികൾ ഉണ്ടോ?

7. മുഖ്യധാരാ പിന്നാക്ക പഠിതാക്കൾക്ക് സ്വീകരിച്ച തന്ത്രങ്ങൾ (ബാധകമായ ടിക്ക്)

ഇന്റർവ്യൂ	
അതിഥി ക്ലാസുകൾ ഫീൽഡ് ട്രിപ്പുകൾ	
വർക്ക് ഷോപ്പുകൾ	
മോട്ടിവേഷൻ ക്ലാസുകൾ	

4. ഗുണനിലവാരമുള്ള വിദ്യാഭ്യാസം

(i) കുട്ടികളുമായുള്ള ബന്ധം

1. കുട്ടികളെ (ആരോഗ്യം, സാമൂഹികം, സാമ്പത്തിക പശ്ചാത്തലം മുതലായവ) സംബന്ധിച്ച സമഗ്രമായ വിവരങ്ങൾ അടങ്ങിയ രേഖകൾ തയ്യാറാക്കി പരിപാലിക്കുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

2. ഓരോ കുട്ടിയുടെയും അക്കാദമിക യോഗ്യതകൾ, പഠന നേട്ടങ്ങൾ മുതലായവ വ്യക്തിഗതമായി തയ്യാറാക്കി കുട്ടിയോടും മാതാപിതാക്കളോടും മറ്റും അറിയിക്കുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

3. പിന്തുണ ആവശ്യമുള്ള കുട്ടികൾക്കായി തനതായ പ്രവർത്തനങ്ങൾ കണ്ടെത്തി നടപ്പിലാക്കുന്നു. പ്രവർത്തനങ്ങളിൽ എല്ലാ കുട്ടികളുടെയും പങ്കാളിത്തം ഉറപ്പാക്കാൻ കഴിയുമോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

4. കുട്ടികളുടെ കലാ/കായിക സൃഷ്ടിപരമായ കഴിവുകൾ തിരിച്ചറിയുന്നതിനും വികസിപ്പിക്കുന്നതിനുമുള്ള ഇടപെടലുകൾ ആവശ്യമാണോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

5. ഓരോ കുട്ടിയുടെയും പഠനനിലവാരം സംബന്ധിച്ച് രക്ഷിതാക്കൾക്ക് കൃത്യമായ ധാരണ നൽകാൻ കഴിയും. അതിനായി സ്വീകരിച്ച തന്ത്രം (WhatsApp ഗ്രൂപ്പ്, നേരിട്ട്, മറ്റുള്ളവ)

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

6. വിദ്യാർത്ഥികളിൽ സർഗ്ഗാത്മക കഴിവുകൾ വികസിപ്പിക്കുന്നതിന് വിവിധ കലാപരിപാടികളിൽ പങ്കെടുക്കാനും രക്ഷിതാക്കളുടെ പങ്കാളിത്തത്തോടെ പ്രകടനം നടത്താനും കഴിയുമോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

7. വിശദമായ പഠന വിഷയവുമായി ബന്ധപ്പെട്ട് ക്ലാസ് റൂം പഠനത്തോടൊപ്പം സ്കൂളുകളിൽ പഠനയാത്രകൾ സംഘടിപ്പിക്കാറുണ്ടോ?

നിരന്തരം	
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ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

8. കമ്പ്യൂട്ടർ പഠനവുമായി ബന്ധപ്പെട്ട കുട്ടികൾക്കുള്ള ഇൻഫർമേഷൻ ടെക്നോളജി കമ്മ്യൂണിക്കേഷൻ മേഖലയിലെ പുതിയ കാര്യങ്ങൾ പാഠ്യപദ്ധതിയിൽ ഉൾപ്പെടുത്തുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

9. സാധാരണ ക്ലാസ് ഇടവേളകളിൽ കുട്ടികളെ രസിപ്പിക്കാനുള്ള ചെറിയ ഗെയിമുകൾ ഉൾപ്പെടുമോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

10. കുട്ടികൾക്കായി ശാസ്ത്രസാഹിത്യ മേളകൾ സംഘടിപ്പിക്കുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

11. വിവിധ തരത്തിലുള്ള ശാസ്ത്ര, സാഹിത്യ, പ്രകൃതി ക്ലബ്ബുകളുടെ രൂപീകരണം നേതൃത്വ സ്വഭാവത്തെ പ്രോത്സാഹിപ്പിക്കുകയും കുട്ടികളിൽ പങ്കാളിത്തം ഉറപ്പാക്കുകയും ചെയ്യുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

12. വിദ്യാർത്ഥികൾക്ക് അവരുടെ അക്കാദമിക് പ്രകടനത്തെ പ്രതിനിധീകരിക്കുന്നതിന് മെഡലുകൾ പോലുള്ള പ്രോത്സാഹനങ്ങൾ നൽകി പ്രോത്സാഹിപ്പിക്കുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

13. പഠന നിലവാരം ചർച്ച ചെയ്യാൻ കുട്ടികളെയും അവരുടെ രക്ഷിതാക്കളെയും ഒരുമിച്ച് കൊണ്ടുവരാറുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	

ഒരിക്കലുമില്ല	
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14. പിന്നാക്കക്കാരായ വിദ്യാർത്ഥികളെ തിരഞ്ഞെടുത്ത് പ്രത്യേക ക്ലാസുകളായി സംഘടിപ്പിക്കുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

15. പുതിയ അധ്യയന വർഷങ്ങളിൽ പാവപ്പെട്ട വിദ്യാർത്ഥികൾക്ക് പഠനോപകരണങ്ങൾ വിതരണം ചെയ്യുന്നുണ്ടോ?

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

(ii) കുട്ടികളുടെ പഠന നിലവാരം

1. കുട്ടികൾക്ക് ഭാഷാ പരിജ്ഞാനം ഉണ്ടോ?

മലയാളം	
ഇംഗ്ലീഷ്	
ഹിന്ദി	
തമിഴ്	

2. ആശയങ്ങൾ ചൊരിയാതെ എഴുതാൻ കഴിവുള്ള കുട്ടികൾ ഉണ്ടോ?

3. ഹ്രസ്വകാല ഇടപെടലിലൂടെ കുട്ടികളുടെ ഭാഷാ വൈദഗ്ദ്ധ്യം മെച്ചപ്പെടുത്താൻ കഴിഞ്ഞിട്ടുണ്ടോ?

4. ദീർഘകാല ഇടപെടൽ ആവശ്യമുള്ള കുട്ടികൾ ഉണ്ടോ?

5. വായനാ ഗ്രഹണം മെച്ചപ്പെടുത്തേണ്ട കുട്ടികൾ ഇപ്പോഴും ഉണ്ടോ?

6. നിങ്ങൾക്ക് വായനാ വൈകല്യമുള്ള കുട്ടികൾ ഉണ്ടോ?

7. കുട്ടിയുടെ അനുഭവത്തിൽ നിന്ന് ഒരു വിഷയത്തെക്കുറിച്ചുള്ള വാചകങ്ങൾ അടങ്ങിയ ഒരു വിഷയം എഴുതാൻ കുട്ടികൾക്ക് കഴിയുമോ?

8. വായനാശീലമുള്ള കുട്ടികൾ നിങ്ങൾക്കുണ്ടോ?

9. ചെറിയ അക്ഷരങ്ങളും വ്യഞ്ജനങ്ങളും എഴുതാൻ അറിയാത്ത കുട്ടികൾ ഉണ്ടോ?

10. കുട്ടികൾക്ക് വ്യക്തിഗത വിവരങ്ങൾ എഴുതാനുള്ള കഴിവുണ്ടോ?

11. കുട്ടികളുടെ വായനയിൽ നിന്ന് മനസ്സിലാക്കുന്ന കാര്യങ്ങളെക്കുറിച്ച് കുറിപ്പുകളുടെ രൂപത്തിൽ കാര്യങ്ങൾ എഴുതുന്ന ആളുകൾ ഉണ്ടോ?
12. ദൈനംദിന പത്രവായനയും പുസ്തകത്തിലെ പ്രധാനപ്പെട്ട കാര്യങ്ങൾ രേഖപ്പെടുത്തുന്നതും ശീലമാക്കുന്ന കുട്ടികൾ നിങ്ങൾക്കുണ്ടോ?
13. അവധി ദിവസങ്ങളിൽ ലൈബ്രറി സന്ദർശിക്കുകയും അവരുടെ പ്രിയപ്പെട്ട പുസ്തകങ്ങളെക്കുറിച്ച് കുറിപ്പുകൾ സൂക്ഷിക്കുകയും ചെയ്യുന്ന കുട്ടികൾ ഉണ്ടോ?
14. മുഴുവൻ അക്ഷരമാലയും മലയാളത്തിൽ എഴുതാനും വായിക്കാനും കഴിയുന്ന കുട്ടികൾ ഉണ്ടോ?
15. ഇംഗ്ലീഷ് അക്ഷരമാല വായിക്കാനും എഴുതാനും കഴിയുന്ന കുട്ടികൾ ഉണ്ടോ?
16. ഹിന്ദി അക്ഷരമാല സീകാൻസുകൾ വായിക്കാനും എഴുതാനും കഴിയുന്ന കുട്ടികൾ ഉണ്ടോ?

(III) ഗണിതശാസ്ത്രപരമായ കഴിവ് (Std III & IV)

1. മൂന്നക്ക സംഖ്യകൾ കൂട്ടുന്നതിനും കുറയ്ക്കുന്നതിനും ബുദ്ധിമുട്ടുന്ന കുട്ടികൾ ഉണ്ടോ?
2. മൂന്നക്ക സംഖ്യകളുടെ ഗുണനത്തിനും വിഭജനത്തിനും ബുദ്ധിമുട്ടുന്ന കുട്ടികൾ നിങ്ങൾക്കുണ്ടോ?
3. പ്രശ്ന പരിഹാര ചോദ്യങ്ങൾ വിശകലനം ചെയ്യാനും അവയിൽ ഏതൊക്കെ ക്യാപ്രൻറുകൾ ഉണ്ടെന്ന് സ്വയം ബോധ്യപ്പെടുത്താനും ബുദ്ധിമുട്ടുള്ള കുട്ടികൾ ഉണ്ടോ?
4. യൂണിറ്റുകൾ എന്താണെന്ന് അറിയാത്ത കുട്ടികൾ ഉണ്ടോ?

യൂണിറ്റ്	എണ്ണം	ശതമാനം
ദൂരം: മീറ്റർ, സെന്റിമീറ്റർ		
സമയം: സെക്കന്റ്, മണിക്കൂർ		
ഉള്ളടക്കം: ലിറ്റർ, മില്ലി ലിറ്റർ		
ഭാരം: കിലോഗ്രാം, ഗ്രാം		

5. സ്കൂളിൽ ഉപയോഗിച്ച് ഒരു നിശ്ചിത അളവിൽ കൃത്യതയോടെ ഒരു രേഖ വരയ്ക്കാൻ ബുദ്ധിമുട്ടുള്ള കുട്ടികൾ ഉണ്ടോ?
6. മൂന്ന് അക്ക നമ്പറിൽ അക്കങ്ങളുടെ സ്ഥല മൂല്യം ശരിയായി പറയാൻ ബുദ്ധിമുട്ടുള്ള കുട്ടികൾ ഉണ്ടോ?

(iv) ജീവിത നൈപുണ്യം

1. എന്റെ ചില പെരുമാറ്റങ്ങൾ സാഹചര്യത്തിന് അനുയോജ്യമാണോ എന്ന് എനിക്ക് സ്വയം വിലയിരുത്താൻ കഴിയും

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

2. മിന്നൽ പണിമുടക്ക് മൂലം ബസ് ലഭ്യമല്ലായിരിക്കാം, അതിനാൽ വീട്ടിലെത്താൻ വൈകിയേക്കാം. ഈ പ്രതികൂല സാഹചര്യത്തെ നേരിടാൻ ആവശ്യമായ മാർഗം എനിക്ക് കണ്ടെത്താൻ കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

3. കുടുംബം അറിയാതെ, ആത്മാർത്ഥതയുള്ള സുഹൃത്ത് ക്ലാസ് ഒഴിവാക്കി ഒരു യാത്രയ്ക്ക് പോകാൻ നിർബന്ധിക്കുന്നു. പങ്കെടുക്കാതിരിക്കാനും അതേസമയം എന്റെ സുഹൃത്തിനെ വിഷമിപ്പിക്കാതിരിക്കാനും എനിക്ക് സാധിക്കും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

4. നിലത്ത് വലിച്ചെറിയുകയും മലിനീകരണത്തിന് കാരണമാവുകയും ചെയ്യുന്ന പാഴ് വസ്തുക്കൾ ശേഖരിച്ച് എനിക്ക് ഗാർഹിക വസ്തുക്കൾ അല്ലെങ്കിൽ കൗതുക വസ്തുക്കൾ നിർമ്മിക്കാൻ കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

5. എന്റെ വീട്ടിൽ വാങ്ങിയ ചായപ്പൊടിയിൽ മായം കലർന്നിട്ടുണ്ടോ എന്ന് ശാസ്ത്രീയമായി കണ്ടെത്താൻ എനിക്ക് കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

6. ഒരേ സംഭവത്തെക്കുറിച്ചുള്ള വ്യത്യസ്ത പത്ര റിപ്പോർട്ടുകൾ വിമർശനാത്മകമായി വിശകലനം ചെയ്യാൻ എനിക്ക് കഴിയുന്നു

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

7. സോഷ്യൽ മീഡിയയിലൂടെ ലഭ്യമായ വിവരങ്ങൾ വിവേകപൂർവ്വം വിവേചിച്ചുകൊണ്ട് സത്യവും അസത്യവും തിരിച്ചറിയാൻ എനിക്ക് കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

8. എന്റെ കുടുംബത്തിന്റെ പ്രതിമാസ ചെലവുകളിൽ അവശ്യവും വെറും ആഡംബരങ്ങളും തമ്മിൽ വേർതിരിച്ചറിയാൻ എനിക്ക് കഴിയുന്നു.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

9. സ്കൂളിലേക്കുള്ള വഴിയിൽ ഞാൻ അപരിചിതരെ കണ്ടുമുട്ടുകയാണെങ്കിൽ, അവരുമായി പെട്ടെന്നുള്ള സൗഹൃദ സംഭാഷണത്തിൽ ഏർപ്പെടാൻ ഞാൻ വിമുഖത കാണിക്കുന്നു.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

10. എനിക്ക് എന്റെ സ്വന്തം വീട്ടിൽ നിന്ന് അവബോധം ആരംഭിക്കാനും മയക്കുമരുന്ന് ഉപയോഗം കുറയ്ക്കുന്നതിന് ഗ്രാമപ്രദേശങ്ങളിൽ എന്റെ സ്വന്തം ഇടപെടലുകൾ നടത്താനും കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

11. എന്റെ സുഹൃത്തിന്റെ വിജയാഘോഷത്തിൽ പങ്ക് ചേരുകയും അതിൽ അഭിമാനം കൊള്ളുകയും ചെയ്യാൻ എനിക്ക് കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

12. സ്കൂളിലേക്കുള്ള യാത്രയിൽ, എന്റെ കൺമുന്നിൽ അപ്രതീക്ഷിതമായി ഒരു അപകടം സംഭവിച്ചാൽ, എനിക്ക് ഇടപെടാനും ഞാൻ ചെയ്യേണ്ടത് ചെയ്യാനും കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

13. സ്കൂളിലേക്കുള്ള വഴിയിൽ റോഡ് മുറിച്ചുകടക്കാൻ പ്രായമായവരെ എനിക്ക് സഹായിക്കാൻ കഴിയും.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

14. എന്റെ വീടും പരിസരവും വൃത്തിയും വെടിപ്പുമുള്ളതായി സൂക്ഷിക്കുന്നതിലും ഞാൻ പങ്കെടുക്കുന്നു.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

15. സ്കൂളുകളിൽ പ്രവർത്തിക്കുന്ന വിവിധ ക്ലബ്ബുകളിൽ പങ്കെടുക്കാനും പ്രവർത്തനങ്ങൾ നടപ്പിലാക്കാനും എനിക്ക് കഴിയുന്നു.

നിരന്തരം	
ഇടയ്ക്കിടെ	
ഒരിക്കലുമില്ല	

5. വിവരസാങ്കേതികവിദ്യ

1. സ്റ്റാർട്ട് ക്ലാസ് മുറികളുള്ള പ്രീ-പ്രൈമറി ക്ലാസ് മുറികൾ ഉണ്ടോ?
2. സ്റ്റാർട്ട് ക്ലാസ് മുറികളുള്ള ലോവർ പ്രൈമറി ക്ലാസുകൾ ഉണ്ടോ?
3. സ്റ്റാർട്ട് ക്ലാസ് മുറികളുള്ള അപ്പർ പ്രൈമറി ക്ലാസുകൾ (യുപി) ഉണ്ടോ?
4. സ്റ്റാർട്ട് ക്ലാസ് മുറികളുള്ള ഹൈസ്കൂൾ ക്ലാസുകൾ ഉണ്ടോ?
5. ഹയർ സെക്കൻഡറി ക്ലാസുകളിൽ സ്റ്റാർട്ട് ക്ലാസ് റൂം ഉണ്ടോ?
6. സംയോജിത പഠന അവസരങ്ങൾ അധ്യാപകർ പ്രയോജനപ്പെടുത്തുന്നുണ്ടോ?
7. കുട്ടികൾക്ക് ദിവസവും കമ്പ്യൂട്ടർ പഠനം ലഭിക്കുന്നുണ്ടോ?

8. ഒരു മാസത്തിൽ ശരാശരി ഒമ്പതാം ക്ലാസ് വിദ്യാർത്ഥികൾ സ്കൂളിൽ നിന്ന് ഓൺലൈൻ സൗകര്യം പ്രയോജനപ്പെടുത്തിയിട്ടുണ്ടോ?

9. ക്ലാസ് റൂം പഠനത്തിന്റെ ഭാഗമായി അധ്യാപകർ വിദ്യാഭ്യാസ സോഫ്റ്റ്‌വെയർ ലഭ്യത ഉപയോഗിക്കുന്നുണ്ടോ [ജിയോജിബ്ര]?

10. ടിങ്കറിംഗ് ലാബ് - 3 ഡി പ്രിൻ്റിംഗ് - സാങ്കേതികവിദ്യയുടെ ഉപയോഗം - കുട്ടികൾക്കായി സ്കൂളുകളിൽ ലഭ്യമാണോ?

6. അധ്യാപകരുടെ മുന്നിലവാരം

1. വിവിധ തലങ്ങളിൽ ജോലി ചെയ്യുന്ന അധ്യാപകരുടെ എണ്ണം

തലം	ആകെ	നിർദ്ദിഷ്ട യോഗ്യത നേടിയവർ	ശതമാനം
പ്രീ-പ്രൈമറി			
ലോവർ പ്രൈമറി			
അപ്പർ പ്രൈമറി			
ഹൈസ്കൂൾ			
ഹയർ സെക്കൻഡറി			

2. സേവന പരിശീലനങ്ങളിൽ ശരിയായി പങ്കെടുക്കാത്ത അധ്യാപകരുടെ എണ്ണം

തലം	ആകെ
പ്രീ-പ്രൈമറി	
ലോവർ പ്രൈമറി	
അപ്പർ പ്രൈമറി	
ഹൈസ്കൂൾ	
ഹയർ സെക്കൻഡറി	

3. നിലവിലെ തസ്തികയിലേക്ക് നിർദ്ദേശിച്ചതിനേക്കാൾ യോഗ്യതയുള്ളവരുടെ എണ്ണം

തലം	ആകെ
പ്രീ-പ്രൈമറി	
ലോവർ പ്രൈമറി	
അപ്പർ പ്രൈമറി	
ഹൈസ്കൂൾ	
ഹയർ സെക്കൻഡറി	

4. പ്രൊഫഷണൽ വികസനത്തിന്റെ ഭാഗമായി സെമിനാറുകൾ, വർക്ക് ഷോപ്പുകൾ മുതലായവയിൽ പങ്കെടുക്കുന്ന അധ്യാപകരുടെ എണ്ണം

തലം	ആകെ
പ്രീ-പ്രൈമറി	
ലോവർ പ്രൈമറി	
അപ്പർ പ്രൈമറി	
ഹൈസ്കൂൾ	
ഹയർ സെക്കൻഡറി	

5. അധ്യാപകരുടെ പ്രൊഫഷണൽ നൈപുണ്യ വികസനം

	പ്രീ-പ്രൈമറി	ലോവർ പ്രൈമറി	അപ്പർ പ്രൈമറി	ഹൈസ്കൂൾ	ഹയർ സെക്കൻഡറി
ആധുനിക സാങ്കേതികവിദ്യ ഫലപ്രദമായി ഉപയോഗിക്കാൻ കഴിവുള്ള അധ്യാപകരുടെ എണ്ണം					
വിവിധ പ്രവർത്തന മികവിന് അംഗീകാരം ലഭിച്ച അധ്യാപകരുടെ എണ്ണം					
സർവീസിൽ ചേർന്ന ശേഷം തുടർപഠനം നടത്തുന്ന / ചെയ്യുന്ന അധ്യാപകരുടെ എണ്ണം					
പ്രശ്നപരിഹാരത്തിനായി ഗവേഷണ പ്രവർത്തനങ്ങൾ ഏറ്റെടുത്ത / നടത്തിയ അധ്യാപകരുടെ എണ്ണം					

7. അടിസ്ഥാന സൗകര്യങ്ങൾ

വിദ്യാഭ്യാസ സ്ഥാപനങ്ങളിലെ ഭൗതിക അക്കാദമിക് സൗകര്യങ്ങൾ വിലയിരുത്തുന്നതിനുള്ള ചോദ്യാവലിയാണിത്. കോളങ്ങളിൽ ആവശ്യമായ എൻട്രികൾ

നടത്തും. നേരിട്ടുള്ള നിരീക്ഷണത്തിലൂടെയും സ്കൂൾ അധികൃതരുമായി ആശയവിനിമയം നടത്തിയുമാണ് വിവരശേഖരണം നടത്തേണ്ടത്.

(i) പ്രീ പ്രൈമറി

1. ശിശുസൗഹൃദ ക്ലാസ് മുറികൾ ഉണ്ടോ?
2. മതിയായ ഫർണിഷ് ചെയ്ത ക്ലാസ് മുറികൾ ഉണ്ടോ?
3. ശിശുസൗഹൃദ ഫർണിച്ചറുകൾ ലഭ്യമാണോ?
4. ചുവർചിത്രങ്ങൾ, പെയിന്റിംഗ് മുതലായവയുള്ള ക്ലാസ് മുറികൾ ഉണ്ടോ?
5. മൃഗങ്ങൾ, പക്ഷികൾ, പൂക്കൾ, ചിത്രശലഭങ്ങൾ മുതലായവയുടെ ചിത്രങ്ങളുടെ പാനലുകളുള്ള ക്ലാസ് മുറികൾ ഉണ്ടോ?
6. ആക്ടിവിറ്റി കോർണറുള്ള സ്കൂളുകൾ ഉണ്ടോ?
7. ശിശുസൗഹൃദ കളി ഉപകരണങ്ങൾ ഉണ്ടോ?
8. വൈദ്യുതി, ഫാൻ, ലൈറ്റ് സൗകര്യങ്ങളുള്ള ക്ലാസ് മുറികൾ ഉണ്ടോ?
9. വായുസഞ്ചാരമുള്ള ജാലകങ്ങളുള്ള ക്ലാസ് മുറികൾ ഉണ്ടോ?
10. നിർദ്ദിഷ്ട വലുപ്പമുള്ള ക്ലാസ് റൂം ഉണ്ടോ?
11. വിശ്രമിക്കാനും ഉറങ്ങാനുമുള്ള സൗകര്യങ്ങൾ ഉണ്ടോ?
12. ശിശുസൗഹൃദ ശൗചാലയം ഉണ്ടോ?
13. സ്കൂളുകൾക്കു ചുറ്റും കവാടങ്ങൾ ഉണ്ടോ?
14. ഭിന്നശേഷിക്കാരായ കുട്ടികൾക്ക് സൗകര്യങ്ങൾ ഉണ്ടോ?

(ii) പാഠ്യ പാഠ്യേതര സൗകര്യങ്ങൾ

1. സർക്കാർ നിർദ്ദേശിച്ച പാഠ്യസ്കൂളുകൾ ലഭ്യമായ ഏതെങ്കിലും സ്കൂളുകൾ ഉണ്ടോ?
2. സ്കൂളുകളിൽ ബാലസാഹിത്യം ലഭ്യമാണോ?
3. വിനോദ സൗകര്യങ്ങൾ ഉണ്ടോ?
4. ലൈറ്റ് വ്യായാമ ഉപകരണങ്ങൾ ഉണ്ടോ?
5. ശിശുസൗഹൃദ കളിപ്പാട്ടങ്ങൾ ഉണ്ടോ?

(iii) ഡിജിറ്റൽ സാങ്കേതിക സൗകര്യങ്ങൾ

1. ലാപ് ടോപ്പുകളും പ്രൊജക്ടറുകളും ഉണ്ടോ?
2. വിദ്യാഭ്യാസ വിനോദം / സിഡി, ഡിവിഡി ഉണ്ടോ?
3. ഓഡിയോ ഗാനങ്ങൾ പ്ലേ ചെയ്യാൻ എന്തെങ്കിലും സൗകര്യങ്ങൾ ഉണ്ടോ?

(iv) ഭക്ഷണവും വെള്ളവും

	തൃപ്തികരം	ശരാശരി	മെച്ചപ്പെടുത്തേണ്ടതുണ്ട്	ഇല്ല
പ്രഭാതഭക്ഷണം				
ഉച്ചഭക്ഷണം				
കുടിവെള്ളം				
മറ്റ് പോഷകാഹാര പദ്ധതികൾ				

(v) പരിസ്ഥിതി ശുചിത്വം

1. വൃത്തിയുള്ള ക്ലാസ് മുറികൾ ഉണ്ടോ?
2. ഉപകരണങ്ങൾ, ഫർണിച്ചറുകൾ മുതലായവ വൃത്തിയാക്കി സൂക്ഷിക്കുന്നുണ്ടോ?
3. വൃത്തിയുള്ള പരിസരവും മുറ്റവും ഉണ്ടോ?
4. കളിസ്ഥലം ഉണ്ടോ?
5. ഒരു പുത്തോട്ടം ഉണ്ടോ?
6. വൃത്തിയുള്ള ശൗചാലയങ്ങൾ ഉണ്ടോ?

(vi) പ്രൈമറി, ഹൈസ്കൂൾ, ഹയർ സെക്കൻഡറി സ്കൂൾ

1. സർക്കാർ നിർദ്ദേശിച്ച തോതിലുള്ള സ്ഥലം ഉണ്ടോ?
2. കളിസ്ഥലം ഉണ്ടോ?
3. നിർദ്ദിഷ്ട ഗെയിമുകൾക്കായി ഒരു പ്രത്യേക കോർട്ട് സംവിധാനം ഉണ്ടോ?
4. ചുറ്റുമതിൽ ഉണ്ടോ?
5. ഗേറ്റ് പ്രവേശനം വിദ്യാർത്ഥി സൗഹൃദമാണോ?

(vii) കെട്ടിടങ്ങൾ

1. സുരക്ഷിതമായ ക്ലാസ് മുറികൾ ഉണ്ടോ?
2. അധ്യാപകർക്കായി പ്രത്യേക സ്റ്റാഫ് റൂമുകൾ ഉണ്ടോ?
3. പുരുഷ, വനിതാ അധ്യാപകർക്ക് വെച്ചേറെ സ്റ്റാഫ് റൂമുകൾ ഉണ്ടോ?
4. ഓഫീസ് പ്രത്യേക മുറികളിലാണോ?
5. ലൈബ്രറിയിൽ പ്രത്യേക മുറി ഉണ്ടോ?
6. ലബോറട്ടറികൾക്ക് പ്രത്യേക മുറി ഉണ്ടോ?
7. ശിശുസൗഹൃദത്തിനായി രൂപകൽപ്പന ചെയ്ത ക്ലാസ് മുറികൾ ഉണ്ടോ?
8. പഠനസൗഹൃദ കോമ്പൗണ്ട് ഉണ്ടോ?
9. വിശ്രമമുറി ഉണ്ടോ?
10. കൗൺസിലിംഗ് റൂം ഉണ്ടോ?
11. ഭിന്നശേഷിക്കാരായ കുട്ടികൾക്കായി റാമ്പ് ഉണ്ടോ?

(viii) ഉച്ചഭക്ഷണം

1. അടുക്കള സുരക്ഷിതവും സജ്ജവുമാണോ?
2. വിദ്യാർത്ഥികൾക്ക് ഭക്ഷണം കഴിക്കാൻ ഡൈനിംഗ് ഹാൾ ലഭ്യമാണോ?
3. സ്കൂളുകളിൽ പാത്രങ്ങളും ഗ്ലാസുകളും ലഭ്യമാണോ?
4. കൈയും പാത്രവും കഴുകാനുള്ള സൗകര്യം ഉണ്ടോ?
5. മാലിന്യസംസ്കരണ സൗകര്യം ഉണ്ടോ?
6. സ്റ്റോർ റൂം ഉണ്ടോ?
7. ആവശ്യമായ സ്ഥലങ്ങളിൽ കുടിവെള്ള സൗകര്യം ഏർപ്പെടുത്തിയിട്ടുണ്ടോ?

(ix) ശുചിത്വം

1. അധ്യാപകർക്കും ജീവനക്കാർക്കും മതിയായ ശുചിമുറികള് ഉണ്ടോ?
2. കുട്ടികൾക്ക് മതിയായ ശൗചാലയങ്ങൾ ഉണ്ടോ?
3. പെൺകുട്ടികൾക്കായി പ്രത്യേക ശുചിമുറികൾ ഉണ്ടോ?
4. ഇൻസിനറേറ്റർ സൗകര്യം ഉണ്ടോ?
5. കെട്ടിടങ്ങളും പരിസരങ്ങളും പൂർണ്ണമായും വൃത്തിയുള്ളതാണോ?

6. ഭിന്നശേഷിക്കാരായ കുട്ടികൾക്ക് അനുയോജ്യമായ ടോയ്സ് സൗകര്യങ്ങൾ ഉണ്ടോ?

(x) പുസ്തകങ്ങൾ

1. എല്ലാ വിദ്യാർത്ഥികൾക്കും പുസ്തകങ്ങൾ ലഭ്യമാണോ?
2. അധ്യാപകരുടെ കൈപ്പുസ്തകങ്ങളും മറ്റ് റഫറൻസുകളും സ്കൂളുകളിൽ ലഭ്യമാണോ?
3. ലൈബ്രറിയിൽ ആവശ്യമായ പുസ്തകങ്ങൾ ഉണ്ടോ?
4. ക്ലാസ് ലൈബ്രറിയിൽ ആവശ്യമായ പുസ്തകങ്ങൾ ഉണ്ടോ?

(xi) ലാബ്, പഠനം, കളി എന്നിവയ്ക്കുള്ള ഉപകരണങ്ങൾ

1. വിവിധ ലബോറട്ടറികളിൽ ആവശ്യമായ ഉപകരണങ്ങൾ ഉണ്ടോ?
2. മറ്റെന്തെങ്കിലും പഠന സാമഗ്രികൾ ആവശ്യമുണ്ടോ?
3. ക്ലാസ് ലാബുകൾ ഉണ്ടോ?
4. സ്റ്റോർട്സ് ഉപകരണങ്ങൾ ഉണ്ടോ?

(xii) ടെക്നോളജി ICT

1. എല്ലാ ക്ലാസ് മുറികളിലും ലാപ്ടോപ്പ് ഉണ്ടോ?
2. ഓരോ ക്ലാസിലും പ്രൊജക്ടർ ഉണ്ടോ?
3. ഓഫീസിൽ ആവശ്യമായ കമ്പ്യൂട്ടർ പ്രിന്റർ ഉണ്ടോ?
4. പൊതു ഹാളിൽ ഒരു ലാപ്ടോപ്പ് പ്രൊജക്ടർ ഉണ്ടോ?
5. ഓഫീസിൽ ഇന്റർനെറ്റ് സൗകര്യം ഉണ്ടോ?
6. ക്ലാസ് മുറികളിൽ ഇന്റർനെറ്റ് ഡിജിറ്റൽ ബോർഡ് ഉണ്ടോ?
7. പബ്ലിക് അഡ്രസ് സിസ്റ്റം ഉണ്ടോ?

(xiii) ഫർണിച്ചർ

1. ഓഫീസിൽ മതിയായ ഫർണിച്ചർ ലഭ്യത ഉണ്ടോ?
2. ക്ലാസ് മുറികളിൽ ആവശ്യത്തിന് ഫർണിച്ചറുകൾ ലഭ്യമാണോ?
3. ചെറിയ ക്ലാസുകളിൽ ശിശുസൗഹൃദ സീറ്റുകൾ ഉണ്ടോ?

8. നിരീക്ഷണം

1. പ്രധാനാധ്യാപകരുടെ നിരീക്ഷണം ഉണ്ടോ?
2. വിദ്യാഭ്യാസ ഓഫീസർമാരുടെ നിരീക്ഷണം ഉണ്ടോ?
3. സമൂഹം സ്കൂളുകളെ വിലയിരുത്തുന്നുണ്ടോ?
4. തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങളുടെ നിരീക്ഷണം ഉണ്ടോ?
5. കുട്ടികൾ സ്ഥാപനത്തിലെ അധ്യാപകരെ വിലയിരുത്താറുണ്ടോ?
6. ഇന്റർ-ഇൻസ്റ്റിറ്റ്യൂഷണൽ പിയർ റിവ്യൂ ടിന്നിംഗ് നടക്കുന്നുണ്ടോ?
7. നിങ്ങൾ ഒരു തത്സമയ പിന്തുണാ സംവിധാനം ഉപയോഗിക്കുന്നുണ്ടോ?

നിരീക്ഷണം- ഫലപ്രാപ്തി പരിശോധനാ നിരക്കിനെക്കുറിച്ച് ചില പ്രസ്താവനകൾ നടത്തുക

1. പ്രധാനാധ്യാപകരുടെ നിരീക്ഷണം ഉണ്ടോ?
2. വിദ്യാഭ്യാസ ഓഫീസർമാരുടെ നിരീക്ഷണം ഉണ്ടോ?
3. സ്കൂളുകൾ സാമൂഹിക മൂല്യനിർണ്ണയത്തിന് വിധേയമാണോ?
4. തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങളുടെ വിദ്യാഭ്യാസ നിരീക്ഷണം നടക്കുന്നുണ്ടോ?
5. കുട്ടികളെ വിലയിരുത്തുന്ന ചില ഘടകങ്ങൾ അധ്യാപകരെ പ്രാദേശികവൽക്കരിക്കുന്നുണ്ടോ?
6. സ്ഥാപനങ്ങൾ തമ്മിലുള്ള പരസ്പര വിലയിരുത്തലിന് ഇരട്ടിപ്പിക്കൽ രീതി ഉപയോഗിക്കുന്നുണ്ടോ?
7. ഒരു തത്സമയ പിന്തുണാ സംവിധാനം ഉണ്ടോ?

9. അനുപചാരിക വിദ്യാഭ്യാസം

1. 15 നും 24 നും ഇടയിൽ പ്രായമുള്ള ഏതെങ്കിലും സാക്ഷരരായ യുവാക്കൾ ഉണ്ടോ?
2. കമ്പ്യൂട്ടർ സാക്ഷരതയുള്ള യുവാക്കൾ ഉണ്ടോ?
3. തൊഴിലധിഷ്ഠിത വിദ്യാഭ്യാസ സ്ഥാപനങ്ങളിൽ പഠിക്കുന്ന ആളുകൾ ഉണ്ടോ?
4. 50 വയസ്സിനു ശേഷം ആരെങ്കിലും അധിക വിദ്യാഭ്യാസ യോഗ്യത നേടിയിട്ടുണ്ടോ?
5. ജോലി ലഭിച്ച ശേഷവും വിദ്യാഭ്യാസം തുടരുന്ന ആളുകൾ ഉണ്ടോ?
6. പ്രത്യേക മേഖലകളിൽ (കൃഷി, വ്യവസായം, സാഹിത്യം മുതലായവ) വ്യക്തിമുദ്ര പതിപ്പിച്ച ആളുകൾ ഉണ്ടോ?
7. വിശിഷ്ട ബഹുമതികൾ / അംഗീകാരങ്ങൾ ലഭിച്ചവരുണ്ടോ?

8. തുടർ സാക്ഷരതാ കേന്ദ്രങ്ങൾ പ്രവർത്തിക്കുന്നുണ്ടോ?
9. സാക്ഷരതാ കേന്ദ്രങ്ങളില്ലാത്ത ഏതെങ്കിലും വാർഡുകൾ ഉണ്ടോ?
10. തുടർച്ചയായ സാക്ഷരതാ കേന്ദ്രങ്ങളിൽ മതിയായ ഫെസിലിറ്റേറ്റർമാർ ഉണ്ടോ?
11. കഴിഞ്ഞ 3 വർഷങ്ങളിൽ നടന്ന തുല്യതാ പരീക്ഷയുടെ വിശദാംശങ്ങൾ

2020-21	ക്ലാസ്	രജിസ്റ്റർ ചെയ്തവർ	വിജയിച്ചവർ
	4		
	7		
	10		
	12		

2021-22	ക്ലാസ്	രജിസ്റ്റർ ചെയ്തവർ	വിജയിച്ചവർ
	4		
	7		
	10		
	12		

2022-23	ക്ലാസ്	രജിസ്റ്റർ ചെയ്തവർ	വിജയിച്ചവർ
	4		
	7		
	10		
	12		

10. അധ്യാപക വിദ്യാഭ്യാസം

1. അംഗീകൃത അധ്യാപക വിദ്യാഭ്യാസ കേന്ദ്രങ്ങളുടെ എണ്ണം

	Govt	Aided	Unaided
Pre primary			
Primary (D.El.Ed)			
Secondary (B.Ed)			

2. അംഗീകൃത സ്ഥാപനങ്ങളിൽ പഠിക്കുന്ന വിദ്യാർത്ഥി അധ്യാപകരുടെ എണ്ണം

	Govt	Aided	Unaided
Pre primary			
Primary (D.El.Ed)			
Secondary (B.Ed)			

3. അധ്യാപക പരിശീലന കേന്ദ്രങ്ങൾക്ക് സർക്കാർ നിർദ്ദേശിക്കുന്ന ഭൗതിക സൗകര്യങ്ങൾ ഉറപ്പാക്കിയ സ്ഥാപനങ്ങൾ

	Govt	Aided	Unaided
Pre primary			
Primary (D.El.Ed)			
Secondary (B.Ed)			

4. അധ്യാപക പരിശീലന സ്ഥാപനങ്ങളിൽ സർക്കാർ നിർദ്ദേശിക്കുന്ന നിർദ്ദിഷ്ട യോഗ്യതയുള്ള അധ്യാപക പരിശീലകരുടെ എണ്ണം

	മൊത്തം അധ്യാപകർ			നിർദ്ദിഷ്ട യോഗ്യതകളില്ലാത്തവർ		
	Govt	Aided	Unaided	Govt	Aided	Unaided
Pre primary						
Primary						
Secondary						

11. വിദ്യാഭ്യാസ അവകാശ നിയമം നടപ്പാക്കൽ ((Right to Education Compatibility)

1. ഒരു കിലോമീറ്റർ ചുറ്റളവിൽ ലോവർ പ്രൈമറി വിദ്യാഭ്യാസ സൗകര്യം ലഭ്യമാണോ?
2. 3 കിലോമീറ്റർ ചുറ്റളവിൽ അപ്പർ പ്രൈമറി സ്കൂൾ സൗകര്യം ഉണ്ടോ?
3. 5 കിലോമീറ്റർ ചുറ്റളവിൽ ഒരു ഹൈസ്കൂൾ സൗകര്യം ഉണ്ടോ?
4. നിശ്ചിത ദൂരത്തിനുള്ളിൽ പഠനസൗകര്യം ലഭ്യമല്ലാത്ത കുട്ടികൾക്ക് വാഹന സൗകര്യം ഉറപ്പാക്കിയിട്ടുണ്ടോ?
5. സ്കൂളുകളിൽ വിദ്യാഭ്യാസ അവകാശ നിയമം അനുശാസിക്കുന്ന ലബോറട്ടറി, ലൈബ്രറി സൗകര്യങ്ങളുള്ള സ്കൂളുകൾ (എൽപി, യുപി, എച്ച്എസ്, എച്ച്എസ്എസ്)
6. എല്ലാ കുട്ടികൾക്കും കളി ഉപകരണങ്ങൾ ലഭ്യമാണോ?
7. രേഖാമൂലമുള്ള ആവശ്യകതകളില്ലാതെ ഏതെങ്കിലും കുട്ടിക്ക് 2 വർഷത്തിലെ ഏതെങ്കിലും പ്രവൃത്തി ദിവസം സ്കൂളിൽ പോകാൻ കഴിയുമോ?
8. സ്വാതന്ത്ര്യവും സ്വകാര്യതയും ഉറപ്പാക്കുന്ന രീതിയിൽ കുട്ടികൾക്ക് പരാതി നൽകാൻ സംവിധാനമുണ്ടോ? (ഉദാഹരണം - പരാതി ബോക്സ്)

Appendix N

Validation Checklist for the Localised Sustainable Development Goals (LSDG) Framework – Attappadi

A. Relevance and Alignment

Criterion	Yes/No	Rating (1–4)	Comments
1. The framework aligns with the core principles of the SDGs.			
2. The objectives are relevant to the socio-cultural context of Attappadi.			
3. The indicators reflect actual developmental needs of tribal communities.			
4. The components are aligned with national and state policies (SDG India Index, NEP 2020, Tribal Development Plans).			

B. Cultural Appropriateness

Criterion	Yes/No	Rating (1–4)	Comments
5. The framework respects indigenous knowledge, customs, and cultural practices.			
6. The content is sensitive to tribal languages (Irula, Muduga, Kurumba).			
7. The strategies are appropriate for tribal settlement patterns, lifestyle, and ecological environment.			
8. The framework avoids practices that might create cultural disruption or conflict.			

C. Clarity and Comprehensibility

Criterion	Yes/No	Rating (1–4)	Comments
9. The goals, indicators, and processes are clearly defined.			

10. The language is easy to understand for local implementers.			
11. Instructions and steps are logically arranged.			
12. Visuals, tables, or models enhance clarity (if applicable).			

D. Practical Feasibility

Criterion	Yes/No	Rating (1–4)	Comments
13. The framework is feasible to implement with existing Panchayat resources.			
14. Required human resources (tribal promoters, teachers, ASHA workers) are available.			
15. Tools and indicators can be used easily in field settings (ooru, hamlets).			
16. Time required for implementation is realistic.			

E. Technical Soundness

Criterion	Yes/No	Rating (1–4)	Comments
17. The indicators are measurable, observable, and evidence-based.			
18. The framework integrates monitoring and evaluation mechanisms.			
19. The model reflects conceptual and theoretical accuracy.			
20. The tool demonstrates internal consistency and coherence.			

F. Inclusiveness and Equity

Criterion	Yes/No	Rating (1–4)	Comments
21. The model addresses the needs of marginalized groups (ST children, women, CWSN).			
22. Gender equity is adequately considered.			
23. Linguistic and literacy-related needs are addressed.			
24. The framework promotes community participation and ownership.			

G. Sustainability and Long-Term Use

Criterion	Yes/No	Rating (1–4)	Comments
25. The framework supports long-term sustainable development goals.			
26. The model can be adapted for future needs without major changes.			
27. Guidance for scaling and replication is included.			

H. Overall Quality

Criterion	Yes/No	Rating (1–4)	Comments
28. The framework appears comprehensive and well-structured.			
29. The model is likely to improve development outcomes in Attappadi.			
30. Stakeholders will find the tool useful and relevant.			

Rating Scale

1 – Poor

2 – Fair

3 – Good

4 – Excellent

Space for General Expert Suggestions

Appendix O

Validation Toolkit for Localised Sustainable Development Goals (LSDG) Framework – Attappadi

Validation Checklist (Expert Review)

Criterion / Item	Rating / Observation	Remarks
Relevance and Alignment		
Cultural Appropriateness		
Clarity and Comprehensibility		
Practical Feasibility		
Technical Soundness		
Inclusiveness and Equity		
Sustainability and Long-Term Use		
Overall Quality		

Content Validity Index (CVI) Scoring Sheet

Criterion / Item	Rating / Observation	Remarks
Expert Number		
Item Number		
Rating (1–4)		
Relevance Score		
I-CVI		
S-CVI		

Pilot Testing Observation Checklist

Criterion / Item	Rating / Observation	Remarks
Clarity of Instructions		
Cultural Appropriateness		
Feasibility of Implementation		
Time Adequacy		
Participant Engagement		
Challenges Observed		
Recommended Modifications		

Stakeholder FGD Checklist

Criterion / Item	Rating / Observation	Remarks
Understanding of LSDG Framework		
Cultural Relevance		
Perceived Usefulness		
Barriers Identified		
Suggestions for Improvement		
Community Readiness		
Overall Acceptance		

Appendix P

Quality Education – Training Module

Session 1 – Localization of Development Indicators and Quality Education

By the end of this session, participants will be able to...

Session 2 – Panchayat-Level Educational Situation Analysis

By the end of this session, participants will be able to...

Session 3 – Standing Committee and Panchayat Education Committee

By the end of this session, participants will be able to...

Session 4 – Education – Rights and Opportunities of Marginalised Groups

By the end of this session, participants will be able to...

Session 5 – Vidyakiranam Mission

By the end of this session, participants will be able to...

Session 6 – Samagra Shiksha Kerala

By the end of this session, participants will be able to...

Session 7 – Health and Physical Education

By the end of this session, participants will be able to...

Session 8 – Comprehensive Educational Development

By the end of this session, participants will be able to...

Annexures

Annexure 1 – Roles and Responsibilities...

Annexure 2 – Checklist...

Annexure 3 – Model Formats...

Annexure 4 – Panchayat Education Plan...

Annexure 5 – References...

Annexure 6 – Feedback Form...

QUALITY EDUCATION

TRAINING MODULE

Contents

- Publisher's Note
- Training Introduction
- Programme Schedule
- Session Plan, Presentation Notes, and Training Materials
- Annexures

I. Background

Sustainable Development Goal 4: Quality Education

The Sustainable Development Goals (SDGs) 2030 represent a globally endorsed framework designed to promote inclusive, equitable, and sustainable development across social, economic, and environmental dimensions. In September 2015, during the United Nations Sustainable Development Summit held in New York, 193 member nations adopted 17 interrelated goals aimed at achieving global well-being by 2030 (United Nations, 2015). Among these, Sustainable Development Goal 4 (SDG 4)—Quality Education—focuses on ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all.

The core objective of SDG 4 is to guarantee that all boys and girls complete free, equitable, and quality primary and secondary education, while ensuring equal access to affordable technical, vocational, and higher education (UNESCO, 2017). Furthermore, it emphasizes the elimination of gender disparities and the promotion of skills necessary for employment, decent work, and entrepreneurship. Education, thus, is recognized not merely as a human right but as a catalyst for sustainable development, influencing diverse sectors such as health, poverty eradication, sanitation, environmental protection, and economic growth (World Bank, 2018). By empowering individuals with knowledge, critical thinking, and life skills, education contributes significantly to both personal advancement and societal transformation.

In the Indian context, the constitutional commitment to education is reflected in Article 21A, which guarantees free and compulsory education for children aged 6 to 14 years. This constitutional right is operationalized through the Right of Children to Free and Compulsory Education (RTE) Act, 2009, which seeks to universalize elementary education and ensure quality learning environments (Government of India, 2009). Complementing this legislative framework, the National Education Policy (NEP) 2020 aligns closely with the vision of SDG 4, emphasizing universal access, foundational literacy and numeracy, quality teacher education, inclusive learning, and lifelong learning opportunities (Ministry of Education, 2020).

The achievement of SDG 4 in India requires a multi-sectoral and localized approach, integrating educational initiatives with broader social and developmental objectives. At the grassroots level, instruments such as the Panchayat Development Index (PDI) play a pivotal role in assessing the performance of Gram Panchayats across diverse indicators of development. By aligning local governance initiatives with SDG-based targets and measurable outcomes, Panchayats can ensure that educational development becomes both data-driven and sustainably impactful. This localized integration of governance, education, and development embodies the transformative potential of the SDGs in realizing equitable progress for all.

II. Training Approach

Training Approach

The training approach of this programme is grounded in the principles of participatory learning, evidence-based planning, and localized implementation of Sustainable Development Goal 4 (Quality Education). It recognizes that sustainable educational progress in Kerala requires the active involvement of Gram Panchayats, local stakeholders, and community-based institutions in data-driven decision-making and continuous improvement.

1. Participatory and Experiential Learning

The training adopts a learner-centered and participatory methodology, encouraging Panchayat representatives, education functionaries, and community leaders to engage actively through discussions, group work, and local case studies. Participants will draw upon their own experiences in managing educational programs, thereby fostering mutual learning and collective problem-solving.

Interactive activities, such as role plays, situational analyses, and micro-planning exercises, will help participants internalize the principles of inclusive and equitable quality education.

2. Evidence-Based and Data-Driven Learning

A key component of the training is building participants' capacity to collect, interpret, and utilize data related to Panchayat Development Index (PDI) indicators on education. Through hands-on exercises, participants will learn how to:

- Identify and analyse data gaps at the Panchayat level,
- Link educational data with planning and budgeting processes, and
- Use data for developing local action plans aimed at achieving SDG 4 targets.

This approach ensures that local educational initiatives are guided by accurate evidence rather than assumptions, enabling more effective and measurable outcomes.

3. Integration of Policy and Practice

The training emphasizes the practical application of state and national education policies such as the Right to Education (RTE) Act, 2009, and the National Education Policy (NEP) 2020, within the Panchayat-level planning framework. Sessions will focus on integrating these policies with local governance mechanisms, thereby strengthening the Panchayat's role in ensuring equitable access, improving school quality, and promoting lifelong learning opportunities.

4. Collaborative and Multi-Stakeholder Engagement

Recognizing that education is a shared responsibility, the training promotes collaboration among multiple stakeholders, including teachers, parents, School Management Committees (SMCs), local libraries, and civil society organizations. Through participatory sessions, participants will explore ways to mobilize community resources and strengthen convergence among departments such as education, social justice, and local self-government.

5. Capacity Building through Reflection and Action

The training follows a “**Learn–Reflect–Act**” model:

- **Learn:** Acquire conceptual and technical knowledge on educational indicators, planning tools, and monitoring frameworks.
- **Reflect:** Assess the existing status of education in their respective Panchayats using real data and local experiences.

- **Act:** Develop a Panchayat-level micro plan or improvement strategy that aligns with SDG 4 and the PDI framework.

This ensures that participants not only gain theoretical knowledge but also translate it into concrete, actionable local strategies.

6. Continuous Learning and Follow-Up Support

Post-training, participants will be encouraged to continue learning through peer networks, mentoring, and follow-up review sessions. Regular monitoring and feedback will help track progress, share best practices, and sustain the outcomes of the training intervention.

Expected Outcome of the Training Approach

By adopting this participatory and data-driven approach, the training programme aims to:

- Enhance the analytical and planning capacity of Panchayat officials; and Educationalist and Implementing officers
- Strengthen evidence-based educational governance at the local level;
- Promote collaborative community participation; and
- Contribute to the achievement of Quality Education (SDG 4) indicators under the Panchayat Development Index (PDI) and (PAI) framework.

III. Training Objectives

By the end of the training, participants will be able to:

- Interpret the principles and targets of Sustainable Development Goal 4 (SDG 4) — *“Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”* — and relate them to local governance and Panchayat-level planning.
- Identify and analyze the Panchayat Development Index (PDI) indicators associated with education, focusing on access, equity, quality, infrastructure, and learning outcomes.
- Recognize existing gaps and challenges in educational access, participation, and quality within their Panchayat jurisdictions using local data and evidence.
- Formulate strategies and micro-level action plans to bridge identified data and performance gaps, ensuring inclusive, equitable, and gender-sensitive educational development.
- Integrate SDG 4-aligned educational goals into the Panchayat’s annual and five-year development plans, ensuring that quality education initiatives are measurable, participatory, and sustainable.
- Promote lifelong learning opportunities by supporting community-based education, digital literacy, vocational training, and inclusive learning for marginalized groups.
- Enhance collaboration and convergence between Panchayats, schools, community organizations, and other stakeholders to strengthen the overall ecosystem for quality education.

IV. Training Methods

The training will adopt **participatory, experiential, and learner-centered methods** that encourage active engagement, reflection, and practical application of knowledge. The following methods will be used to ensure effective learning outcomes and meaningful participation:

- **Interactive Presentations:**
Facilitators will introduce key concepts related to Sustainable Development Goal 4 (Quality Education), Panchayat Development Indicators (PDI), and education-related governance frameworks through short, visually supported presentations designed to provoke discussion and critical thinking.
- **Group Discussions and Reflections:**
Participants will share their local experiences, challenges, and best practices related to education. Guided reflections will help them connect theoretical concepts with real-life Panchayat-level contexts, fostering peer learning and collaborative problem-solving.
- **Group Work and Participatory Exercises:**
Through small-group activities, participants will analyze education data, identify gaps, and design local action plans aligned with SDG 4. These activities will strengthen teamwork, collective planning, and decision-making skills.
- **Case Studies and Local Examples:**
Real-life examples and case studies from Kerala's education initiatives—such as the Literacy Mission, Vidyakiranam Project, and community-based school improvement programs—will be discussed to illustrate successful strategies and inspire local adaptation.
- **Guided Reading and Resource Review:**
Participants will engage with selected reading materials, policy briefs, and reports (e.g., RTE Act 2009, NEP 2020, and PDI framework) to deepen understanding of educational governance and planning mechanisms. Trainers will provide guidance for interpretation and application.
- **Participatory Planning Sessions:**
Practical sessions will enable participants to apply their learning by developing Panchayat-level micro plans for improving quality education, ensuring alignment with SDG 4 targets and local needs.
- **Feedback and Reflection Sessions:**
Each session will conclude with reflection and feedback discussions to help participants consolidate their learning, identify takeaways, and plan follow-up actions for their Panchayats.

V. Participants

The participants of the training programme will include:

- **Elected representatives of Gram Panchayats, Other Stakeholders, Implementing Officials, Educational Department officials**
- **Members of the Education Working Group, Civil Society Organisations**
- **Administrative officials**

VI. Trainers

The sessions will be led by **trainers who have undergone “Training of Trainers” (ToT)** for this module.

VII. Training Medium

- The medium of training will be **Malayalam**.

VIII. Duration

- **Two days (560 minutes total).**

IX. Evaluation

- The training will be evaluated through **online feedback** collected from the participants.

X. Training Content

- **Session Titles**
- **Session 1:** Localisation of Development Indicators and Quality Education – Role of Local Governments

Session 2: Panchayat-Level Educational Situation Analysis

Session 3: Standing Committee and Panchayat Education Committee

Session 4: Education – Rights and Opportunities of Marginalised Groups

Session 5: *Vidyakiranam* (Education Mission)

Session 6: *Samagra Shiksha Kerala* and Its Structure

Session 7: Health and Physical Education

Session 8: Educational Development – Activities that Can Be Undertaken

QUALITY EDUCATION TRAINING PROGRAMME

Programme Schedule

Day One

Time	Session	Topic
09:30 – 10:00 AM	Registration	
10:00 – 10:45 AM	Welcome & Inauguration	Introduction, Pre-Test
10:45 – 11:00 AM	Tea Break	
11:00 – 11:45 AM	Session 1	Localisation of Development Indicators and Quality Education – Role of Local Governments
11:45 – 12:45 PM	Session 2	Panchayat-Level Educational Situation Analysis
12:45 – 01:45 PM	Lunch Break	
01:45 – 02:45 PM	Session 3	Standing Committee and Panchayat Education Committee
02:45 – 04:15 PM	Session 4	Education – Rights and Opportunities of Marginalised Groups
04:15 – 04:30 PM	Tea Break	

• Day Two

Time	Session	Topic
09:30 – 10:15 AM	Reflection on Day One	
10:15 – 11:00 AM	Session 5	<i>Vidyakiranam</i> (Education Mission)
11:00 – 11:15 AM	Tea Break	
11:15 – 12:15 PM	Session 6	<i>Samagra Shiksha Kerala</i> and Its Structure
12:15 – 01:15 PM	Session 7	Health and Physical Education
01:15 – 02:00 PM	Lunch Break	
02:00 – 03:00 PM	Session 8	Educational Development – Activities that Can Be Undertaken
03:00 – 03:30 PM	Post-Test	
03:30 – 03:45 PM	Tea Break	

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SESSION – 1

Topic: Localization of Development Indicators and Quality Education – Role of Local Governments

Session Overview

This session introduces the conceptual framework of Sustainable Development Goals (SDGs), focusing on SDG 4, and explores the process of localising development indicators through the Panchayat Development Index (PDI). Participants will understand how educational performance influences Panchayat ranking and overall development outcomes.

Learning Objectives:

By the end of this session, participants will be able to:

- To introduce the concept of **Sustainable Development Goals (SDGs)** and their **localization** through Panchayati Raj Institutions.
- Understand the **background** of the Panchayat Development Index (PDI).
- Comprehend the **objectives** and **components** considered in the PDI.
- Recognize the **role and responsibilities** of Local Governments in ensuring *Quality Education*.
- To help participants understand how educational achievements contribute to **Panchayat performance** and ranking.

Learning Outcomes

General Learning Outcome:

Participants understand the concept of **localizing Sustainable Development Goals (SDGs)**, particularly **SDG 4 (Quality Education)**, and the role of Local Governments in improving educational indicators.

Specific Learning Outcomes:

By the end of this session, participants will be able to:

1. Explain the **structure and objectives** of the Panchayat Development Index (PDI).
2. Describe the **link between SDGs and local governance**.
3. Identify the **role of Panchayats** in achieving Quality Education goals.
4. Recognize how **education-related indicators** influence Panchayat planning and ranking.
5. Apply the understanding of PDI to plan local education projects effectively.

Duration: 45 minutes

Method: Lecture-based, with supporting visual aids and discussion.

Content and Learning Methods

No.	Topic	Time (Minutes)	Method	Materials
1	Evolution and milestones	10	Presentation	Slides 2 & 3, Note 1
2	Panchayat Development Index – Background and structure	15	Presentation	Slides 4–13, Note 2
3	Role of Local Governments in ensuring quality education	15	Presentation	Slides 14–18, Note 3
4	Conclusion	5	Presentation	Slides 19–22, Note 4

Trainer Activity vs Participant Learning

Trainer Activity	Participant Learning/Outcome
Present the concept of SDG localisation and PDI framework.	Understand how education indicators are integrated into PDI.
Discuss Kerala's decentralised education governance model.	Relate Panchayat-level actions to SDG 4 targets.
Facilitate reflection on data-driven planning.	Develop awareness of measurable educational performance.

Trainer Notes

Note 1 – Context

Explain, with the help of slides 2 and 3, how the Panchayat Development Index (PDI) was formulated as part of the **localization of the Sustainable Development Goals (SDGs)**. Provide a brief overview of the process of developing and institutionalizing the PDI in Kerala.

Note 2 – Understanding the PDI

Using slides 4–13, describe in detail how the PDI acts as an **indicator framework** for evaluating the progress, performance, and achievements of Panchayats. Facilitate interactive discussion among participants to ensure conceptual clarity.

Note 3 – Role of Local Governments

Explain that under **Article 243G** of the Constitution (introduced through the **73rd Constitutional Amendment, 1992**), Panchayats are empowered to **prepare and implement plans** for economic development and social justice.

According to the Eleventh Schedule of the Constitution, Panchayats are responsible for planning and implementing schemes related to 29 subjects delegated by the State Government. As per the **Kerala Panchayat Raj Act, 1994**, and notifications issued by the Department of Local Self Government and the Planning Department, Gram Panchayats are required to implement development and welfare programmes in the sectors assigned to them.

The **Third, Fourth, and Fifth Schedules** of the Kerala Panchayat Raj Act clearly state that it is the **statutory responsibility** of Panchayats at all three levels to provide the necessary services to the community within the sectors assigned to them.

Kerala's decentralised planning system entrusts institutions and officials from departments such as Agriculture, Animal Husbandry, Fisheries, Rural Development, Social Justice, Scheduled Caste Development, Scheduled Tribe Development, Health, Ayurveda, Homeopathy, and General Education to support Panchayats in carrying out these responsibilities.

Therefore, the expectation under the PDI is **not to introduce an entirely new system**, but to **strengthen and align existing Panchayat functions** with measurable indicators—particularly under the new thematic goal of *Quality Education*.

The focus should be on ensuring that:

- Educational activities are integrated into the Panchayat's development process,
- Available resources are used effectively, and
- The Panchayat's rank under the PDI is improved through better educational performance.

Slides 14–18 may be used to elaborate on the **sectoral responsibilities** of Panchayats in the field of education at all three levels (Gram, Block, and District).

Note 4 – Conclusion

Emphasize that Panchayats should utilize all available resources during the planning process to achieve the stated educational objectives. This will help in **improving the Panchayat's PDI ranking** and **ensuring quality education for citizens**.

SESSION – 2

Topic: Panchayat-Level Educational Situation Analysis

Session Overview

This session guides participants in conducting an educational situation analysis within their Panchayat. It focuses on identifying existing resources, data gaps, and challenges related to the

PDI indicators for quality education. Through group discussions, participants will develop short-term and long-term strategies for improvement.

Learning Objectives

By the end of this session, participants will be able to:

1. Understand the **current educational situation** within the Panchayat area.
2. To familiarize participants with **education-related indicators** in the PDI framework.
3. To guide participants in formulating **short-term and long-term interventions** to address identified issues.
4. Identify **data gaps** related to the educational indicators in the Panchayat Development Index (PDI).
5. Plan and design **programmes or activities** to address these gaps and improve educational outcomes.
6. To integrate the educational situation analysis into **Panchayat Development Plans**.

Learning Outcomes

General Learning Outcome:

Participants understand the concept of **localizing Sustainable Development Goals (SDGs)**, particularly **SDG 4 (Quality Education)**, and the role of Local Governments in improving educational indicators.

Specific Learning Outcomes:

By the end of this session, participants will be able to:

1. Explain the **structure and objectives** of the Panchayat Development Index (PDI).
2. Describe the **link between SDGs and local governance**.
3. Identify the **role of Panchayats** in achieving Quality Education goals.
4. Recognize how **education-related indicators** influence Panchayat planning and ranking.
5. Apply the understanding of PDI to plan local education projects effectively.

Duration: 60 minutes

Method: Participatory session with group discussion and presentation.

Mode: Common training mode (mixed lecture + group work).

Content and Methodology

No.	Topics	Time (Minutes)	Method	Materials
1	Quality Education and Panchayat Development Indicators	15	Presentation	Slides 2–10, Note 1
2	Additional Indicators	5	Presentation	Slide 11, Note 2
3	Quality Education – Situation Analysis (Group Work)	35	Group discussion and presentation	Slide 12, Note 3
4	Conclusion	5	Discussion	Slide 11, Note 4

Learner Activity

Participants work in groups to analyse local education data using a model template. They identify gaps and propose actions to address them. Each group presents findings for discussion, linking them to the Panchayat Development Plan.

Trainer Activity vs Participant Learning

Trainer Activity	Participant Learning/Outcome
Introduce education-related PDI indicators.	Comprehend local educational parameters.
Facilitate group data analysis using the checklist.	Identify data gaps and propose actions.
Summarise group findings linking to Panchayat planning.	Integrate findings into development frameworks.

Trainer Notes

Note 1 – Understanding PDI Indicators

Introduce participants to the **education-related indicators** within the Panchayat Development Index (PDI). Explain each indicator with the help of slides 2–10 and discuss how these indicators help assess the status of educational development in the Panchayat.

Note 2 – Additional Indicators

In addition to the existing indicators in the PDI, there may be **additional local-level indicators** that can be considered depending on the specific context of the Panchayat. Encourage participants to identify such possible indicators and add them to the analysis if necessary.

Note 3 – Group Activity: Educational Situation Analysis

Facilitate a group exercise where participants analyse the **existing data gaps** in both PDI and additional indicators.

Each group should:

- Review current Panchayat-level data.
- Identify deficiencies or missing information (data gaps).
- Propose **short-term (1–1.5 years)** and **long-term (up to 2030)** programmes and interventions to address these issues.

After group discussion (20 minutes), participants should present their findings (15 minutes).

During the presentations, emphasize that the proposed programmes can later be integrated into the Panchayat's **Annual Plan** or **Project Proposals**. Funding can be mobilized from various sources such as:

- **Central and State Government schemes,**
- **Panchayat Development Fund,**
- **Maintenance Grants,**
- **Own Funds,** and
- **CSR funds (Corporate Social Responsibility).**

Trainers should guide participants on how to link the activities with these funding streams.

Note 4 – Conclusion

Conclude the session by summarizing the key points that emerged from the group presentations.

Highlight that:

- Panchayats should take proactive measures based on the findings of the educational situation analysis.
- Special attention must be given to **students from marginalised sections** to prevent dropouts and ensure their academic and extracurricular participation.
- Panchayats should design **targeted interventions** for supporting students in arts, sports, and skill development.

Education Committee (PEC) — their roles, responsibilities, and importance in ensuring quality education.

SESSION – 3

Topic: Standing Committee and Panchayat Education Committee (PEC)

Session Overview

This session introduces the legal and institutional framework governing education at the local level. It elaborates on the functions of the Standing Committee and the Panchayat Education Committee (PEC) as per the Kerala Panchayat Raj Act and G.O.(Rt) No. 84/2022/LSGD. A case study is used to contextualise decision-making and coordination mechanisms.

Learning Objectives

By the end of this session, participants will be able to:

1. Understand the **roles and responsibilities** of the Standing Committees as per the **73rd Constitutional Amendment** and the **Kerala Panchayat Raj Act**.
2. To explain the **legal and institutional framework** for Standing Committees and PECs under the Kerala Panchayat Raj Act.
3. To describe the **roles, responsibilities, and powers** of the Education Standing Committee.
4. To explain the **composition and functioning** of the Panchayat Education Committee.
5. To discuss **coordination mechanisms** between the Standing Committee, PEC, and school-level bodies like PTAs and SMCs.
6. Recognize the **importance of the Education Standing Committee** in ensuring quality education.
7. Understand the **structure, duties, and functions** of the **Panchayat Education Committee (PEC)**.
8. To build participant capacity to **apply model guidelines** (G.O. 84/2022/LSGD) for effective local educational governance.

Learning Objectives

Duration: 1 hour

Mode: Common training mode (combined lecture, case discussion, and group activity).

Content and Methodology

No.	Topic	Time (Minutes)	Method	Materials
1	Case Study Discussion	15	Case presentation and discussion	Case 1, Slides 1–2
2	Role of the Standing Committee in Ensuring Quality Education	20	Reading material, group discussion, and consolidation	Slides 3–8, Annexure 1
3	Duties and Powers of the PEC (Panchayat Education Committee)	15	Discussion and consolidation	Slide 8, Annexure 1

4	Structure of the PEC – Members, Roles, and Schedule	15	Discussion and consolidation	Slides (continuation), Annexure 1
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Case Study 1

During a meeting held at the Kadavanad Gram Panchayat, the Headmaster raised several issues — shortage of teachers, poor attendance of students, and lack of safe drinking water facilities in the school. The Chairperson of the Education Standing Committee listened carefully and suggested that a detailed report be submitted to the Panchayat President.

Discussion Points:

- How should the Standing Committee respond to such issues?
- What procedures should be followed to address educational problems at the Gram Panchayat level?
- What are the possible actions the Panchayat can take?

Use **Slide 2** to guide this discussion.

Trainer Notes and Reading Material

Reference: "Nava Keralathinuayi Grama Panchayathukal" (Book No. 1)

Section 5.3 – Standing Committees (As per Sections 162 and 162A of the Kerala Panchayat Raj Act)

Gram Panchayats have multiple responsibilities. These responsibilities are distributed among various **Standing Committees**.

Before taking a final decision on any subject, the Panchayat must **study and deliberate** on it thoroughly — this is done initially by the relevant Standing Committee.

The recommendations and reports prepared by the Standing Committee are then presented before the Panchayat for final approval.

Responsibilities include:

- Ensuring that agenda items brought before the Panchayat have been properly examined by the relevant Standing Committee.
- Overseeing the **implementation of Panchayat decisions** to ensure effective execution.
- Submitting periodic reports and recommendations to the Panchayat for discussion and necessary follow-up actions.

Role in the Education Sector

In the field of education, both the **Working Group** and the **Standing Committee** have to work in coordination. According to **Government Order (No. 84/2022/LSGD dated 19/04/2022)**, the *Model Guidelines* (Pages 98–100) describe specific roles and responsibilities for these

committees. Trainers should distribute this reading material to participants and give them 20 minutes to read and discuss in groups (**Annexure 1**).

After the reading, each group should:

- Identify how the Standing Committee and PEC can effectively function at the Panchayat level, and
- Present examples of what activities have been undertaken in their Panchayat during the current year.

Then, the trainer should explain, using **slides**, the **model projects** that can be implemented to strengthen educational governance at the Panchayat level.

Key Discussion Outcomes

- The Standing Committee and PEC are **core mechanisms** within local self-government institutions to ensure **inclusive, equitable, and quality education**.
- Their coordination helps link **school-level issues** with **Panchayat-level planning and resources**.
- Effective functioning of these committees contributes to achieving the **educational indicators** under the **Panchayat Development Index (PDI)**.

Case Study Summary

A Headmaster in Kadavanad Gram Panchayat reports challenges such as teacher shortage and unsafe infrastructure. Participants discuss how the Standing Committee and PEC should respond institutionally and administratively to address these issues.

Trainer Activity vs Participant Learning

Trainer Activity	Participant Learning/Outcome
Present case study and facilitate group analysis.	Understand PEC and Standing Committee functions.
Explain provisions from G.O.(Rt) No. 84/2022/LSGD.	Identify legal mandates and governance structure.
Encourage reflection on coordination between school-level and Panchayat bodies.	Recognise mechanisms of local education governance.

SESSION – 4

Topic: Education – Rights and Opportunities of Marginalised Groups

Session Overview

This session examines inclusion and equality in education. It focuses on social and educational barriers affecting marginalised groups and explores Panchayat-level interventions to promote rights-based education.

Objectives

By the end of this session, participants will be able to:

1. Understand the **concept of marginalisation** and the **types of marginalised groups** in society.
2. Identify the **barriers** faced by such groups in accessing quality education.
3. Recognize the **responsibility of Local Governments** in ensuring the right to education and equal opportunities for all.

General and Specific Objectives

General Objectives	Specific Objectives
Promote awareness of inclusive and equitable education.	Identify major marginalised groups and their educational barriers.
Strengthen Panchayat capacities for inclusion.	Apply RTE 2009 and NEP 2020 provisions to local contexts.

Learning Outcomes

Participants will be able to:

- Define marginalisation and its educational impact.
- Interpret rights-based frameworks for education.
- Design inclusive strategies for marginalised learners.

Duration: 1 hour 30 minutes

Method: Common training mode (lecture + group discussion + reflection).

Content and Methodology

No.	Topic	Time (Minutes)	Method	Materials
1	Understanding Marginalisation	20	Presentation	Slides 2–8, Note 1
2	Issues Faced by Marginalised Groups in Education	25	Group discussion	Slides 9–14, Note 2

3	Rights-Based Approach to Education	25	Presentation and discussion	Slides 15–20, Note 3
4	Role of Local Governments	15	Discussion and consolidation	Slides 21–24, Note 4
5	Conclusion	5	Discussion	Slide 25

Learner Activities

1. Group Mapping: Identify marginalised learners in the Panchayat.
2. Case Review: Study a Panchayat’s inclusive education practice.
3. Planning Exercise: Draft an inclusive initiative for local adoption.

Trainer Activity vs Participant Learning

Trainer Activity	Participant Learning / Outcome
Explain marginalisation and legal frameworks.	Understand rights-based approaches to inclusion.
Facilitate group mapping of learners.	Identify barriers and propose practical solutions.

Trainer Notes

Note 1 – Understanding Marginalisation

Explain the term “**marginalisation**” as a process by which certain groups or individuals are pushed to the edges of society — politically, socially, or economically — and denied access to resources and opportunities.

Examples include:

- Scheduled Castes (SC)
- Scheduled Tribes (ST)
- Women and children
- Persons with disabilities
- Elderly people
- Migrant and coastal populations
- Transgender persons
- People living in remote or conflict-affected areas

Discuss how marginalisation affects access to **education, employment, and social participation**.

Use **slides 2–8** to highlight relevant statistics and examples from Kerala and India.

Note 2 – Issues Faced by Marginalised Groups in Education

Initiate a **group discussion** based on the following key points:

- **School access issues:** distance, transportation difficulties, unsafe roads.
- **Infrastructure deficiencies:** lack of toilets, inadequate facilities, poor classroom environment.
- **Language barriers:** especially among tribal and migrant children.
- **Social discrimination:** caste-based exclusion, gender bias, and stigma.
- **Economic barriers:** child labour, poverty, and family responsibilities that prevent schooling.
- **Learning difficulties:** lack of remedial teaching, emotional and psychological challenges.

Encourage participants to share **local examples** and experiences from their own Panchayats. Use **slides 9–14** to supplement the discussion.

Note 3 – Rights-Based Approach to Education

Explain the **Right to Education (RTE) Act, 2009**, which ensures **free and compulsory education** for all children aged 6–14 years.

Highlight the responsibilities of government institutions and local bodies under this law.

Key principles:

- Education is not charity — it is a **fundamental right**.
- No child can be denied admission based on caste, gender, religion, or disability.
- Every child has a right to **quality education** that ensures **learning outcomes**, not just school enrollment.

Discuss important legal and policy frameworks:

- **Right to Education Act (2009)**
- **National Education Policy (NEP) 2020**
- **Kerala State Right to Education Rules (2011)**

Explain how these policies guide the **inclusive education strategy** of Kerala. Use **slides 15–20** to illustrate these points.

Note 4 – Role of Local Governments

Local Governments (Panchayats, Municipalities, and Corporations) have a crucial role in realising **inclusive and equitable education**.

Their roles include:

- Identifying and tracking **out-of-school children**, especially from marginalised communities.
- Ensuring **school accessibility** (safe transport, infrastructure, and sanitation).
- Providing **financial and material support** (uniforms, study materials, scholarships).
- Coordinating with **Education Departments, Social Justice, Tribal Development, and SC/ST Welfare Departments**.

- Promoting **awareness programmes** among parents and communities.
- Monitoring **school functioning and quality** through the **Panchayat Education Committee (PEC)**.

Emphasize that **inclusive education** is a shared responsibility of all — teachers, parents, Panchayats, and the community.

Use **slides 21–24** to summarise these roles.

Note 5 – Conclusion

Summarize the discussion by stressing that:

Ensuring the *Right to Education* is not only a legal obligation but also a moral and developmental necessity.

Encourage participants to reflect on what specific steps their Panchayats can take to ensure **no child is left behind**.

Reflection / Conclusion

Inclusive education is essential for realising SDG 4. Panchayats must ensure no learner is left behind.

SESSION – 5

Topic: Vidyakiranam Mission

Session Overview

This session introduces the Vidyakiranam Mission, one of Kerala’s flagship programmes for strengthening public education through innovation and community partnership. It builds upon the Comprehensive Education Protection Campaign and promotes localized learning models through community participation and technology integration.

Objectives

By the end of this session, participants will be able to:

1. Develop awareness about the **Vidyakiranam Mission**, an educational initiative under the **Nava Kerala Karma Padhathi** (New Kerala Action Plan).
2. Understand how the Vidyakiranam programmes can be **integrated** with local government planning and educational projects.

General and Specific Objectives

General Objectives	Specific Objectives
Familiarize participants with the vision and objectives of Vidyakiranam Mission.	Explain the evolution of the programme and its impact on Kerala’s education sector.
Encourage Panchayat participation in Vidyakiranam activities.	Identify feasible Vidyakiranam initiatives for Panchayat-level planning.

Promote innovative educational practices.	Design locally relevant, sustainable learning activities.
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Learning Outcomes

Participants will be able to:

- Describe the structure and purpose of the Vidyakiranam Mission.
- Identify community-led and technology-driven educational initiatives.
- Integrate Vidyakiranam activities into Panchayat planning processes.

Duration: 40 minutes

Method: Common training mode (lecture + discussion).

Content and Methodology

No.	Topic	Time (Minutes)	Method	Materials
1	From the “Comprehensive Education Protection Campaign” to the Vidyakiranam Mission	5	Discussion	Note 1
2	Objectives of the Vidyakiranam Mission	20	Presentation	Slides 1–5
3	Key Activities under the Vidyakiranam Mission	10	Presentation	Slides 6–8, Note 2
4	Clarification and Conclusion	5	Discussion	

Trainer Notes

Note 1 – Background: From the Comprehensive Education Protection Campaign to Vidyakiranam

In **2016**, the newly elected Government of Kerala launched the **Nava Kerala Karma Padhathi (New Kerala Action Plan)**, a five-year mission framework aimed at sectoral development through people’s participation. As part of this initiative, the **Comprehensive Education Protection Campaign (Samagra Vidyabhyasa Samrakshana Yajnam)** was introduced through Government Order **G.O. (Rt) No. 41/2016/PE&MD** dated **28 September 2016**. The campaign achieved remarkable progress in strengthening **public education** across the state. Over **1.2 million students** returned to the public school system, resulting in both **academic and infrastructural transformation**.

In **2021**, the subsequent government issued **G.O. No. 1/2022/PE&MD**, rebranding the initiative as the **Vidyakiranam Mission**. The mission aims to sustain and expand the achievements of the earlier campaign by ensuring comprehensive educational development in every local body.

Use **slides 1–5** to introduce and discuss the objectives of the Vidyakiranam Mission.

Note 2 – Major Activities under the Vidyakiranam Mission

Explain the key innovative programmes being implemented under the mission. Use **slides 6–8** and the following details for discussion.

1. “Venchadi” Project

A creative, child-friendly mathematics learning approach designed to simplify concepts for upper primary students.

It uses innovative teaching-learning materials and activity-based techniques developed in collaboration with **Kerala Infrastructure and Technology for Education (KITE)**. The “Venchadi” model is currently being implemented experimentally in **100 schools** across Kerala.

2. “Neelakurinji Quiz Programme”

A knowledge enrichment initiative jointly implemented by **Haritha Kerala Mission, World Wildlife Fund (WWF)**, and **Jal Jeevan Mission**.

It promotes awareness among students about environmental sustainability, water conservation, and biodiversity.

The state-level event was inaugurated at **Athaloori Government Higher Secondary School, Kozhikode**.

3. “Maths Lab” (Mathematics Laboratory)

A creative learning space designed to enhance the mathematical skills and reasoning abilities of children.

As part of the **Vythiri Programme in Wayanad**, 2000 schools were equipped with **Maths Labs**, where **4000 teachers** and **60,000 students** received hands-on training.

4. “Little KITES IT Club”

India’s largest student-based IT network.

In Kerala, **2174 Little KITES units** operate in schools, with **1.8 lakh (180,000) students** as active members.

These clubs promote digital literacy, responsible use of technology, and coding skills among school children.

During discussion, clarify participants’ doubts about the integration of Vidyakiranam programmes with Panchayat planning.

Encourage them to identify ways their Panchayats can support these initiatives through **funding, infrastructure, or community mobilisation**.

Key Takeaways

- The **Vidyakiranam Mission** continues Kerala's commitment to public education as a collective social responsibility.
- Local governments can play a critical role by **mainstreaming these initiatives** within their educational plans and budgets.
- The mission contributes directly to achieving **Sustainable Development Goal 4 – Quality Education**.

Trainer Activity vs Participant Learning

Trainer Activity	Participant Learning / Outcome
Present programme details and examples.	Understand objectives and scope of Vidyakiranam Mission.
Facilitate group reflection on feasibility.	Identify applicable innovations for local planning.

Reflection / Conclusion

Innovation and community participation lie at the heart of quality education. Vidyakiranam exemplifies how local governments can sustain creativity and inclusiveness in schools.

SESSION – 6

Topic: Samagra Shiksha Kerala (SSK) – Objectives and Structure

Session Overview

This session explores Samagra Shiksha Kerala (SSK), Kerala's integrated school education programme under the national Samagra Shiksha Abhiyan. It emphasizes the collaboration between Panchayats and SSK to ensure access, equity, and quality in education from pre-primary to higher secondary levels.

Objectives

By the end of this session, participants will be able to:

1. Understand the **objectives and key features** of the Samagra Shiksha Kerala (SSK) programme.
2. Identify the **implementation structure and components** of SSK.
3. Recognize the **monitoring and evaluation mechanisms** under SSK.
4. Understand the **role of Local Governments** in ensuring the effective implementation of SSK.

General and Specific Objectives

General Objectives	Specific Objectives
Understand the institutional structure and objectives of SSK.	Explain its integration of access, equity, and quality dimensions.

Promote Panchayat–SSK collaboration for school improvement.	Apply SSK tools for planning, budgeting, and monitoring education.
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Learning Outcomes

Participants will be able to:

- Explain SSK's goals and operational structure.
- Recognize its role in inclusive education and quality improvement.
- Develop Panchayat–SSK collaborative action plans.

Duration: 60 minutes

Method: Lecture and participatory discussion

Content and Methodology

No.	Topic	Time (Minutes)	Method	Materials
1	Background and Objectives of Samagra Shiksha Kerala	5	Presentation	Slides 2–3
2	Structural Components and Implementation Framework	5	Presentation	Slides 3–5
3	Programmes and Activities under SSK	5	Presentation	Slides 6–10
4	Roles and Responsibilities of Stakeholders	10	Presentation	Slides 11–20
5	Monitoring and Evaluation	10	Presentation	Slides 21–23
6	Integration with Local Government Plans	10	Discussion	Slides 24
7	Summary and Clarifications	10	Open discussion	Slides 25–28
8	Reflection	5	Discussion	—

Trainer Notes

1. Background

Begin by explaining the **origin and purpose** of the Samagra Shiksha Kerala (SSK) programme.

The scheme was launched to unify and strengthen three centrally sponsored schemes — **Sarva Shiksha Abhiyan (SSA)**, **Rashtriya Madhyamik Shiksha Abhiyan (RMSA)**, and **Teacher Education (TE)** — into a single, comprehensive programme that addresses the entire spectrum of school education from **pre-primary to senior secondary** levels.

The **Samagra Shiksha Scheme** was designed to ensure holistic development of education, focusing on **quality, equity, and inclusion**, and to improve **learning outcomes** through integrated planning.

2. Key Objectives

- To improve **school infrastructure** and **learning environments**.
- To ensure **universal access** and **retention** of children in schools.
- To provide **quality education** through modern teaching methodologies and training.
- To enhance **teacher capacity** through continuous professional development.
- To promote **digital education** and the use of ICT in classrooms.
- To integrate **vocational education** with mainstream schooling.
- To encourage **inclusive education** for children with special needs (CWSN).
- To strengthen **community participation** in school governance.

3. Structure and Implementation

Explain that **Samagra Shiksha Kerala (SSK)** is implemented through a **state-level body** under the **General Education Department**, Government of Kerala. It functions through a **three-tier structure**:

1. **State Project Office (Thiruvananthapuram)** – Planning, training, and monitoring.
2. **District Project Offices** – Implementation and coordination at district level.
3. **Block Resource Centres and Cluster Resource Centres (BRC/CRC)** – Academic support and training for teachers.

Use **slides 3–10** to illustrate the administrative hierarchy and coordination mechanisms.

4. Roles and Responsibilities

Explain the shared responsibilities of various stakeholders involved in the SSK programme:

- **State Government / SSK State Office:** Policy formulation, planning, monitoring, fund allocation.
- **District Panchayat:** Supervision of implementation in coordination with District Education Offices.
- **Block Panchayat:** Monitoring and facilitating educational interventions at the block level.
- **Gram Panchayat:** Local coordination, support to schools, community awareness, infrastructure maintenance, and inclusion of SSK objectives in the local development plan.
- **School Management Committees (SMCs):** Ground-level monitoring of school functioning, learning outcomes, and community involvement.

5. Monitoring and Evaluation

Monitoring in SSK is conducted through a **multi-level system** that includes:

- **School-based self-assessment tools** for tracking performance.
- **Periodic school visits** by BRC/CRC officials.
- **Learning outcome assessments** and **annual performance reports**.
- **Community-based monitoring** through **School Management Committees**.

Slides **21–23** may be used to describe the flow of data from school to state level for decision-making.

6. Integration with Local Government Plans

Explain how Panchayats can integrate SSK initiatives into their **Annual Plans** and **Panchayat Development Index (PDI)** indicators.

Local Governments can support SSK through:

- Providing **additional classrooms and facilities**.
- Supporting **teacher training and ICT-based learning**.
- Organizing **special learning support programmes** for children from marginalised groups.
- Conducting **awareness campaigns** on school enrolment and attendance.

Key Takeaways

- **Samagra Shiksha Kerala (SSK)** is the state's flagship programme for achieving universal, inclusive, and quality education.
- It aligns with **SDG 4 (Quality Education)** and Kerala's **Panchayat Development Index** goals.
- Local Governments have a vital role in ensuring that educational outcomes are effectively translated into **local action**.

Learner Activities

1. **Data Exercise:** Review UDISE+ data for selected Panchayats.
2. **Case Study:** Discuss a Panchayat–SSK joint project.
3. **Action Planning:** Draft simple SSK-linked Panchayat education projects.

Trainer Activity vs Participant Learning

Trainer Activity	Participant Learning / Outcome
Present SSK framework and indicators.	Understand national-to-local education linkage.
Facilitate case study analysis.	Identify areas for joint planning.

Reflection / Conclusion

SSK and Panchayats are partners in achieving SDG 4. Strengthened collaboration ensures equitable learning for every child.

SESSION – 7

Topic: Health and Physical Education

Session Overview

This session connects health, nutrition, and physical education with educational outcomes. It highlights Kerala's school health policies, *Mid-Day Meal Scheme*, and physical education programmes, stressing the Panchayat's role in creating healthy learning environments.

General and Specific Objectives

General Objectives	Specific Objectives
Recognize the importance of health and physical education in holistic learning.	Describe health and nutrition programmes in schools.
Integrate health and wellness into Panchayat education planning.	Design health-focused local interventions and partnerships.

Objectives

By the end of this session, participants will be able to:

1. Explain the **importance and relevance** of health and physical education.
2. Describe the **methods and tools** used to assess children's physical fitness.
3. Understand the **importance of nutritious food habits** for good health.
4. Identify the **initiatives** that Panchayats can undertake to promote physical education and sports.
5. Understand and explain the concept of **KIDS Athletics**.

Duration: 60 minutes

Method: Common training mode (participatory presentation and discussion).

Content and Methodology

No.	Topic	Time (Minutes)	Method	Materials
1	Health and Physical Education – Importance and Relevance	10	Participatory presentation	Slides 1–2
2	Importance of Developing Physical Fitness in Children	5	Participatory presentation	Slide 3
3	Methods of Assessing Physical Fitness in Children	10	Participatory presentation	Slide 4, Note 1
4	Importance of Nutritious Food Habits	10	Participatory presentation	Slides 5–6
5	Personal Hygiene among Children	5	Participatory presentation	Slide 7
6	Promoting Physical Education at Panchayat Level	5	Participatory presentation	Slide 8
7	Panchayat-level Initiatives for Sports and Recreation	5	Participatory presentation	Slides 9–10

8	KIDS Athletics – Concept and Practice	5	Participatory presentation	Slide 11, Note 2
9	Discussion and Clarifications	5	Open discussion	Slide 12

Trainer Notes

Note 1 – Physical Fitness Assessment Tools

Explain the **physical fitness tests** that can be used to evaluate the health and performance of schoolchildren.

These are practical and simple tools that can be applied in schools and community sports programmes.

1. Body Mass Index (BMI)

BMI helps to determine whether a person's body weight is appropriate for their height.

Formula:

$$\text{BMI} = \text{Weight (kg)} \div \text{Height (m}^2\text{)}$$

2. Plate Tapping Test

Assesses **speed and coordination** of hand movements.

Procedure:

1. Arrange tables according to the child's height.
2. Place two discs 60 cm apart on the table.
3. Put a small rectangular block midway between them.
4. The child places their **non-dominant hand** on the block and, with the **dominant hand**, alternately touches both discs as quickly as possible.
5. Record the time taken to complete **25 full cycles**.

3. Flamingo Balance Test

Assesses **static balance and leg muscle strength**.

Procedure:

- The child stands on one leg, folds the other leg backward, and holds it with the hand on the same side.
- When signaled, the child tries to maintain balance as long as possible.
- Count the number of falls or loss of balance within **60 seconds**.
- If balance is lost more than 15 times within the first 30 seconds, the test ends.

4. Partial Curl-Up Test (30 Seconds)

Assesses **abdominal muscle strength and endurance**.

Procedure:

- The child lies flat on a mat with knees bent and hands on the floor.
- Keeping hands extended forward, they curl up the upper body so the fingers slide across a marked line 6 inches in front.
- Return to the starting position each time.
- Record the number of curl-ups completed in **30 seconds**.

5. Push-Up Test

Assesses **upper body strength and endurance**.

Procedure:

- The child lies face down with palms on the floor and arms shoulder-width apart.
- Extend arms to lift the body, keeping it straight.
- Lower the body until the chest nearly touches the ground, then return to the starting position.
- Count the number of correctly performed push-ups.

(Modified push-ups can be used for girls if necessary.)

6. Sit-and-Reach Test

Assesses **flexibility** of the lower back and hamstring muscles.

Procedure:

- The child sits with legs straight and soles of feet against a measuring box.
- Keeping knees flat, they reach forward with both hands as far as possible.
- Measure the distance reached (in cm or mm).
- Hold the position for **1–2 seconds** for accurate reading.

7. 600-Metre Run/Walk Test

Assesses **cardiovascular endurance**.

Procedure:

- The child runs or walks 600 metres at maximum possible speed.
- Record the total time taken to complete the distance.
- Walking is permitted, but participants should be encouraged to run at least part of the distance.

8. 50-Metre Dash

Assesses **speed**.

Procedure:

- The child runs 50 metres as fast as possible from a standing start.
- The teacher records the time taken to cross the finish line.

Note 2 – KIDS Athletics

Explain the **KIDS Athletics Programme**, an internationally recognized initiative designed to develop children's interest in athletics and promote physical fitness from an early age.

Key Points:

- Introduced in Kerala for children aged **4–12 years**.
- Aims to counter sedentary lifestyles caused by excessive screen time (“from cradle to fingertip culture”).
- Provides safe, enjoyable, and structured physical activity through fun games and athletics.
- Helps identify and nurture athletic talent from primary school onwards.
- Encourages teamwork, discipline, and lifelong fitness habits.

Background:

The KIDS Athletics programme, developed by the **International Association of Athletics Federations (IAAF)**, was introduced in India in 2013.

In Kerala, it is implemented in primary schools through the **Department of General Education**, promoting scientific and safe athletic training.

Key Takeaways

- Health and physical education are **integral parts of holistic development**.
- Panchayats can promote these programmes through **school-level sports festivals, fitness assessments, and community awareness campaigns**.
- Regular exercise, nutritious food, and personal hygiene should be encouraged among all schoolchildren.
- KIDS Athletics provides a model for integrating **fun and structured physical activity** into school curricula.

Trainer Activity vs Participant Learning

Trainer Activity	Participant Learning / Outcome
Explain school health frameworks.	Understand significance of wellness in education.
Facilitate audit and planning.	Develop actionable local wellness strategies.

Reflection / Conclusion

Healthy schools foster lifelong learning. Panchayats must ensure every child has access to health, hygiene, and sports facilities.

SESSION – 8

Topic: Comprehensive Educational Development – Activities That Can Be Undertaken

Session Overview

The final session synthesises all module themes, guiding participants to prepare a Comprehensive Panchayat Education Development Plan (PEDP) aligned with SDG 4 and PDI indicators. It promotes convergence across education, health, and social justice sectors.

Objectives

By the end of this session, participants will be able to:

1. Understand the **activities that Panchayats can implement** for comprehensive educational development.
2. Identify **new and innovative interventions** that can be included in the Panchayat Development Plan.
3. Recognize how to **link educational initiatives** with the Panchayat Development Index (PDI).

General and Specific Objectives

General Objectives	Specific Objectives
Integrate knowledge from all sessions into one plan.	Develop a comprehensive, evidence-based Panchayat Education Plan.
Promote convergence and community participation.	Coordinate PEC, SMC, and Standing Committee activities for sustainability.

Learning Outcomes

Participants will be able to:

- Apply PDI indicators to assess education performance.
- Draft multi-sectoral, inclusive education plans.
- Link plans with SDG 4 and Panchayat annual planning cycles.

Duration: 60 minutes

Method: Common training mode (participatory presentation and group discussion).

Content and Methodology

No.	Topic	Time (Minutes)	Method	Materials
1	Introduction	5	Presentation	Slide 1
2	Panchayat's Role in Educational Development	15	Presentation	Slides 2–5
3	Examples of Innovative Programmes and Activities	25	Presentation	Slides 6–12

4	Group Discussion – Designing Local Action Plans	10	Discussion	Slides 13–15
5	Conclusion	5	Discussion	Slides 16–17

Trainer Notes

Note 1 – Introduction

Begin the session by recalling the earlier discussions from Sessions 1–7. Explain that Panchayats are **key local actors** in ensuring access to **quality, equitable, and inclusive education**. The **Panchayat Development Index (PDI)** provides measurable indicators for monitoring progress. This session focuses on **practical ways** to translate those indicators into **local-level action**.

Note 2 – Panchayat’s Role in Educational Development

The Panchayat can undertake multiple initiatives to strengthen education at the local level. Some of the **major roles** include:

1. **Identifying Out-of-School Children:**
2. Conduct regular surveys to identify children who have dropped out or are at risk of doing so, and ensure their re-enrolment.
3. **Ensuring Inclusive Education:**
4. Implement programmes that provide special support to children from Scheduled Castes (SC), Scheduled Tribes (ST), differently-abled children, and migrant families.
5. **Improving Infrastructure:**
6. Support the construction or renovation of classrooms, toilets, compound walls, ramps, and drinking water facilities.
7. **Promoting Early Childhood Care and Education (ECCE):**
8. Strengthen Anganwadis, ensure nutritional support, and integrate ECCE with the Panchayat’s education and health plans.
9. **Enhancing Learning Quality:**
10. Introduce remedial teaching, reading corners, and local library activities to improve academic outcomes.
11. **Supporting Digital and Technological Learning:**
12. Promote ICT classrooms, digital libraries, and smart classrooms in collaboration with *Samagra Shiksha Kerala (SSK)* and *KITE Kerala*.
13. **Encouraging Sports and Arts:**
14. Organize school-level and Panchayat-level arts and sports festivals, cultural clubs, and fitness awareness programmes.
15. **Community Participation:**
16. Strengthen School Management Committees (SMCs) and ensure parental involvement in education planning and monitoring.

Note 3 – Examples of Innovative Educational Programmes

Use **slides 6–12** to discuss successful examples and models of local interventions across Kerala that can inspire Panchayats:

1. **“Ottumayi Padikkam” (Let’s Learn Together):**
2. A programme to reduce learning gaps and improve foundational literacy and numeracy among lower primary students.
3. **“Padana Padavukal” (Learning Steps):**
4. A structured peer-learning model that enables students to teach and support each other through mentorship and group activities.
5. **“Sahayi” Project:**
6. A mental health support initiative for students, providing counselling and emotional well-being services at the school level.
7. **“Haritha Vidyalayam” (Green School):**
8. Promotes environmental awareness, waste management, and green campus initiatives.
9. **“Vidyajyothi” (Learning Support for Special Needs):**
10. Provides assistive learning materials, Braille kits, and special training for children with disabilities.
11. **“Vanchippattu Padanam” (Learning through Folk Songs):**
12. Encourages cultural learning through local art forms, integrating heritage education into school activities.
13. **“Nalla Padam” (Good Practice Programme):**
14. Identifies and documents exemplary practices of schools and Panchayats that have achieved excellence in education.

Note 4 – Group Discussion: Designing Local Action Plans

Ask participants to divide into small groups and design **local action plans** based on the educational needs of their Panchayat.

Each group should:

- Identify the most pressing educational issues in their Panchayat (e.g., school dropouts, lack of facilities, learning gaps).
- Propose **3–5 actionable interventions** that could be implemented in the next planning cycle.
- Indicate the **possible funding sources**, such as:
 - Panchayat’s own funds,
 - Maintenance grant,
 - *Samagra Shiksha Kerala (SSK)* support,
 - CSR funds, or
 - Departmental schemes.

After the group discussions, participants present their proposals in plenary. Trainers should consolidate these ideas into a **model action plan** template.

Note 5 – Conclusion

Conclude the session by summarizing the key message:

“Education is the foundation of sustainable local development. Local Governments must lead efforts to ensure that every child receives quality education and equal opportunities to learn, grow, and thrive.”

Encourage participants to adopt a **convergent approach**, linking education with health, social justice, and child development sectors for holistic results.

Key Takeaways

- Panchayats have both **legal authority** and **moral responsibility** to ensure quality education for all.
- Comprehensive educational development requires collaboration among **schools, families, and community organisations**.
- Innovative and locally relevant programmes can significantly enhance **learning outcomes** and **social inclusion**.
- Integration of educational initiatives with **SDG 4** and **Panchayat Development Index (PDI)** indicators helps ensure measurable progress.
- **Trainer Activity vs Participant Learning**

Trainer Activity	Participant Learning / Outcome
Lead final planning workshop.	Develop holistic, SDG-aligned Panchayat Education Plan.

- **Reflection / Conclusion**
- Comprehensive planning transforms education into a collective mission. Panchayats are the custodians of community-driven learning ecosystems.

ANNEXURES

Annexure 1

Roles and Responsibilities of the Standing Committee and Panchayat Education Committee (PEC)

(As per Government Order G.O.(Rt) No. 84/2022/LSGD dated 19/04/2022)

The **Standing Committee on Education** and the **Panchayat Education Committee (PEC)** are the two core institutional mechanisms within every Panchayat that oversee educational development.

A. Education Standing Committee – Functions

1. Ensure the **effective implementation** of programmes related to general education, continuing education, and skill development.
2. Coordinate with the **Education Working Group** and various departments to prepare and monitor the education component of the Panchayat's **Annual Plan**.
3. Supervise the functioning of **schools and educational institutions** under the Panchayat's jurisdiction.
4. Support the maintenance of **school infrastructure** — classrooms, toilets, drinking water, and playgrounds.
5. Monitor the **attendance and performance** of students and teachers through periodic reviews.
6. Ensure the inclusion of **marginalised children** (Scheduled Castes, Scheduled Tribes, and differently-abled students) in all educational activities.
7. Promote awareness on **Right to Education (RTE)** and child protection issues.

8. Recommend specific **educational projects** for inclusion in the Panchayat Development Plan.

B. Panchayat Education Committee (PEC) – Composition and Role

Each Panchayat must constitute a **Panchayat Education Committee (PEC)**, chaired by the **Panchayat President** or the **Chairperson of the Education Standing Committee**.

Composition:

1. President / Chairperson of the Panchayat – Chairperson
2. Convener – Chairperson of the Education Standing Committee
3. Members of the Education Standing Committee
4. Headmasters of schools within the Panchayat
5. Representatives of Parent–Teacher Associations (PTAs)
6. One representative each from Scheduled Caste and Scheduled Tribe communities
7. One representative from the **Women’s Development Committee**
8. Representatives from **Anganwadi Teachers, NGOs, and Youth Clubs**
9. One student representative (where applicable)

Functions:

1. Discuss and recommend solutions to **educational issues** raised at the local level.
2. Review **enrolment, dropout, and attendance** trends.
3. Ensure the **implementation of government educational schemes**.
4. Facilitate coordination between **schools and the Panchayat**.
5. Review **school health and nutrition programmes** in coordination with the Health Standing Committee.
6. Promote **community participation** and parental engagement.
7. Prepare a **local educational report** for presentation to the Panchayat Assembly.

Annexure 2

Checklist for Panchayats – Education Development Indicators (Based on PDI Framework)

Indicator Area	Key Points to Verify
Access to Education	Number of schools within Panchayat; availability of pre-primary, primary, and secondary levels.
Infrastructure	Condition of classrooms, toilets (separate for boys/girls), drinking water, electricity, and digital facilities.
Quality of Education	Learning achievement data, teacher–student ratio, and co-curricular activities.
Inclusion	Provisions for SC/ST, differently-abled, and migrant children.
Community Participation	Functioning of SMCs, PTAs, and PECs; attendance in meetings.
Health and Nutrition	Implementation of mid-day meals, deworming, vaccination, and school health check-ups.
Digital Education	Number of smart classrooms, ICT labs, KITE resources.
Extracurricular Activities	Arts, sports, clubs, and cultural programmes.

Panchayats should use this checklist while preparing their **education status report** and in developing annual education projects.

Annexure 3

Model Format – Educational Situation Analysis

Indicator / Issue	Current Situation	Data Source	Data Gap	Short-Term Action Plan (1 Year)	Long-Term Action Plan (Up to 2030)
School Infrastructure	80% schools have sufficient classrooms	SSK report	Data not available for private-aided schools	Renovate 5 classrooms	Ensure all classrooms meet safety standards
Enrolment of ST Students	92% enrolment	School register	Dropout data missing	Conduct re-enrolment drive	Achieve 100% retention by 2030
Digital Learning	15 smart classrooms	Panchayat record	—	Convert 5 more classrooms to ICT-based	All schools digital-enabled by 2030
Student Health	2 health camps/year	Health Dept. report	—	Conduct school health survey	Annual check-up and fitness tracking

This format can be adapted by Panchayats for situation analysis during training or planning workshops.

Annexure 4

Model Format – Panchayat Education Action Plan

Goal / Target Area	Proposed Activity	Implementing Agency	Expected Outcome	Funding Source
Improve literacy among adults	Adult literacy campaign in coordination with Continuing Education Centre	Education Standing Committee	150 adults achieve literacy	Panchayat own fund
Promote health awareness	School Health and Nutrition Week	Health & Education Committees	100% participation	Maintenance fund
Support inclusive education	Provide assistive devices for CWSN	SSK & Social Justice Dept.	100 children benefit	CSR / Govt. scheme
Enhance digital learning	ICT lab and e-content training	KITE / SSK	All upper primary students use e-learning	SSK + Panchayat fund

Annexure 5

References and Resources

- Government of Kerala (2016). *Comprehensive Education Protection Campaign – G.O. (Rt) No. 41/2016/PE&MD.*
- Government of Kerala (2021). *Vidyakiranam Mission – G.O. (Rt) No. 1/2022/PE&MD.*
- Government of Kerala (2022). *Guidelines for Standing Committees – G.O. (Rt) No. 84/2022/LSGD.*
- Department of General Education. *Samagra Shiksha Kerala Annual Report.*
- Ministry of Panchayati Raj (2015). *Localisation of Sustainable Development Goals – Guidelines.*
- Kerala Institute of Local Administration (KILA). *Training Handbook Series on SDGs.*

Annexure 6

Evaluation and Feedback Format

Parameter	Rating (1–5)	Remarks
Relevance of Training Topics		
Quality of Presentation		
Usefulness of Materials		
Participant Involvement		
Time Management		
Overall Effectiveness		

Participants can fill out this form at the end of the training programme to provide feedback for improvement.

Closing Note

“Education is the key to sustainable progress and human dignity. Local Governments must lead the way in creating inclusive, equitable, and quality learning environments that leave no child behind.”

Part IV – Consolidated Trainer–Learner Matrix (Sessions 1–8)

Trainer Activity	Participant Learning / Outcome
Introduce SDG 4, its indicators, and link to local governance.	Understand how SDG 4 connects to Panchayat-level education planning.
Present Panchayat Development Index (PDI) and education metrics.	Interpret and analyse educational data to identify development gaps.
Facilitate group analysis of local data.	Develop skills for situation analysis and evidence-based planning.
Explain governance structures – Standing Committee and PEC.	Recognise institutional mechanisms for education governance.
Lead discussion on inclusion and marginalised learners.	Identify barriers and design equitable education strategies.
Demonstrate Vidyakiranam Mission models.	Learn innovative and community-based practices for educational improvement.

Explain Samagra Shiksha Kerala (SSK) framework.	Collaborate effectively between Panchayats and SSK units.
Demonstrate health and wellness audit tools.	Apply school health indicators to enhance learning environments.
Facilitate comprehensive plan preparation.	Draft integrated Panchayat Education Development Plans aligned with SDG 4.

Annexure 6 – Participant Feedback Form

Participant Name: _____

Designation / Panchayat: _____

Parameter	Excellent	Good	Average	Suggestions
Relevance of content	☐	☐	☐	
Usefulness of activities	☐	☐	☐	
Clarity of presentation	☐	☐	☐	
Trainer's effectiveness	☐	☐	☐	
Overall satisfaction	☐	☐	☐	

Participant Comments: _____

Part VI – Trainer's Facilitation Guide

Pre-Training Preparation

- Arrange venue with AV facilities and seating for group work.
- Distribute participant handbooks and materials.
- Display SDG 4, PDI, and Vidyakiranam posters.
- Confirm availability of PEC and SSK data for local relevance.

Two-Day Training Schedule Grid

Day / Time	Session	Method	Duration (min)
Day 1 – Forenoon	1. Localization of Development Indicators & Quality Education	Lecture + Discussion	45
	2. Panchayat-Level Educational Situation Analysis	Group Work	60
Day 1 – Afternoon	3. Standing Committee & PEC	Lecture + Case Study	60
	4. Education & Marginalised Groups	Discussion + Planning	90
Day 2 – Forenoon	5. Vidyakiranam Mission	Lecture + Interaction	40
	6. Samagra Shiksha Kerala (SSK)	Lecture + Exercise	60
Day 2 – Afternoon	7. Health & Physical Education	Demonstration + Group Work	60
	8. Comprehensive Educational Development	Workshop + Plan Preparation	90

Facilitation Tips

- Encourage active participation and sharing of Panchayat-level experiences.
- Use real PDI and UDISE data wherever possible.
- Relate discussions to participants' own Panchayat contexts.
- Maintain gender balance and inclusion in group formation.
- Summarise each session and connect back to SDG 4 goals.

Evaluation and Reflection

- Begin with a *Pre-Test* (awareness of SDG 4, PDI, PEC).
- Conclude with a *Post-Test* and group reflection.
- Collect feedback using Annexure 6.
- Prepare a summary report including participant reflections and next steps.

Documentation and Reporting Format

1. **Cover Page:** Include date, venue, and institution.
2. **Participant List:** Include contact details and designations.
3. **Session Summaries:** Include learning points and action items.
4. **Photographs:** Highlight participatory activities.
5. **Feedback Analysis:** Present quantitative and qualitative feedback.
6. **Follow-Up Plan:** Mention mentorship, PEC meetings, and review sessions.

Closing Message

“Education is the bridge between knowledge and empowerment.
Local governments must become champions of inclusive and sustainable learning for all.”



‘ഭരണഭാഷ മാതൃഭാഷ’

പട്ടികവർഗ്ഗ വികസന വകുപ്പ് ഡയറക്ടറുടെ കാര്യാലയം
നാലാം നില, വികാസ് ഭവൻ, തിരുവനന്തപുരം - 695 033
ഫോൺ : 0471-2304594, 0471-2303229
ഇ-മെയിൽ keralatribes@gmail.com

നമ്പർ:STDD/4762/2025-B2

തീയതി :24-12-2025

ഡയറക്ടർ

Sukanya K U
PhD,Research Scholar
NSS Training College ,Ottapalam

സർ,

വിഷയം : പട്ടികവർഗ്ഗവികസന വകുപ്പ്-ഗവേഷണ പ്രബന്ധം അവതരിപ്പിക്കുന്നതിന് അനുമതി നൽകുന്നത്-സംബന്ധിച്ച്

സൂചന : Sukanya K U,Research scholar 12.12.2025 ന് സമർപ്പിച്ച കത്ത്

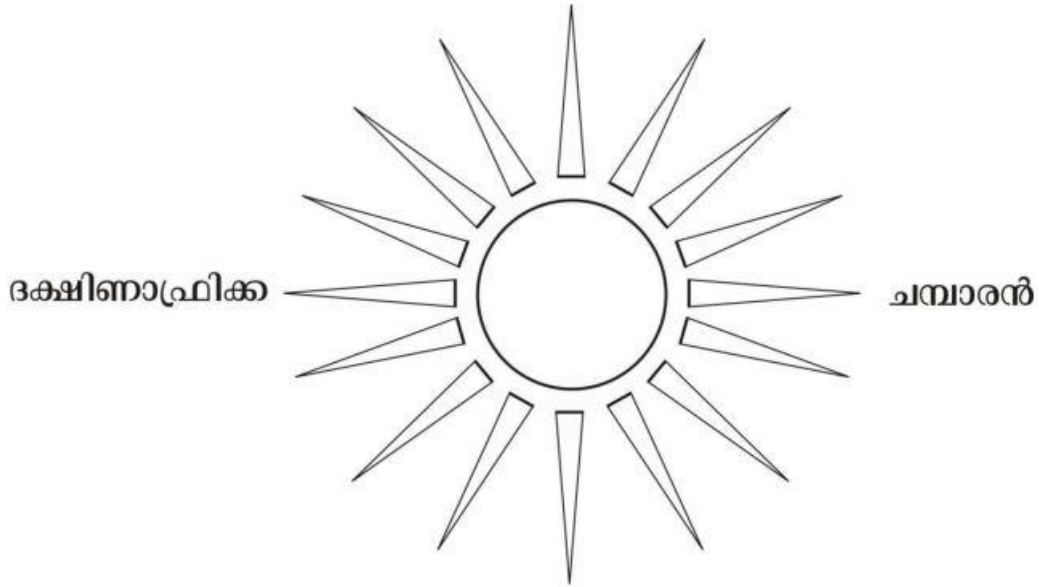
കേരള ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് ലോക്കൽ അഡ്മിനിസ്ട്രേഷനിൽ (കില) റിസർച്ച് അസോസിയേറ്റായി ജോലി ചെയ്യുന്ന Sukanya K U ഗവേഷണം “Impact of Localising Sustainable Development Goals(SDGs) on Life Skills and Academic Achievement of Tribal Students in Attappadi.” എന്ന വിഷയത്തിൽ പൂർത്തിയാക്കിയിട്ടുണ്ടെന്നും, ഇത് സംബന്ധിച്ച ഗവേഷണ നടപടിക്രമങ്ങളും പ്രബന്ധം സമർപ്പിക്കലും നടത്തുന്നതിന് അനുമതി നൽകണമെന്നും സൂചന പ്രകാരം അറിയിച്ചിരുന്നു. വകുപ്പ് ഇക്കാര്യം വിശദമായി പരിശോധിച്ചതിന്റെ അടിസ്ഥാനത്തിൽ താങ്കൾക്ക് ഗവേഷണ നടപടിക്രമങ്ങളും പ്രബന്ധം സമർപ്പിക്കലും നടത്തുന്നതിന് വകുപ്പിന് തടസമില്ല എന്ന വിവരം അറിയിക്കുന്നു.പഠന റിപ്പോർട്ടിന്റെ പകർപ്പ് ചുവടെ ഒപ്പിട്ടിരിക്കുന്ന ഉദ്യോഗസ്ഥന് ലഭ്യമാക്കേണ്ടതാണ്. അല്ലാത്തപക്ഷം ബന്ധപ്പെട്ട വ്യക്തി/സ്ഥാപനത്തിൽ നിന്നും തുടർന്ന് ലഭിക്കുന്ന അപേക്ഷകൾ പരിഗണിക്കുന്നതല്ല എന്നും അറിയിക്കുന്നു .

വിശ്വസ്തയോടെ,

Appendix R

Life Skills Assessment Tool for Upper Primary (Malayalam Version – Draft)

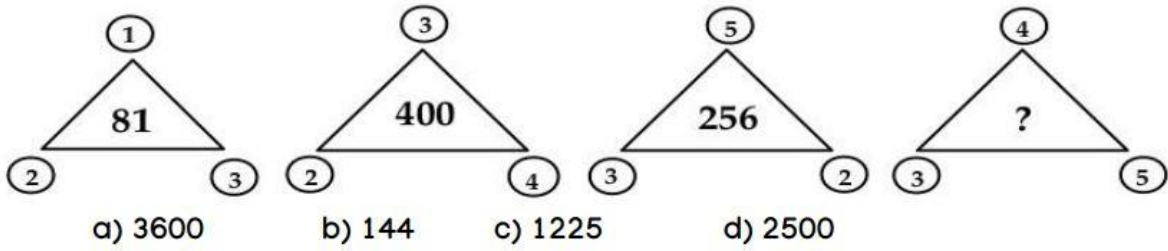
1. മഹാത്മ ഗാന്ധിയുമായി ബന്ധപ്പെട്ട ആശയസൂര്യൻ വിപുലീകരിക്കുക



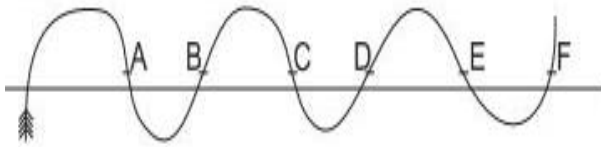
2. സ്ഥലങ്ങളെ വിവരിക്കാൻ ഉപയോഗിക്കുന്ന വാക്കുകൾ തിരഞ്ഞെടുക്കുക

clean	hilly	old
cold	hot	quiet
colourful	humid	rural
cool	industrial	sandy
crowded	modern	urban
dirty	mountainous	windy
flat	narrow	

3. വിട്ടു പോയ സംഖ്യ കണ്ടെത്തുക



4. താഴെ പറയുന്ന ചിത്രത്തിൽ 4 പുതിയ തൈകൾ ഉണ്ടാക്കാൻ മുറിക്കേണ്ട ഭാഗങ്ങൾ ഏതാണ്?



- A) ACE B) ACD C) BDEF D) ABCDEF
5. താഴെ കൊടുത്തിരിക്കുന്ന പദങ്ങൾ കണ്ടെത്തുക

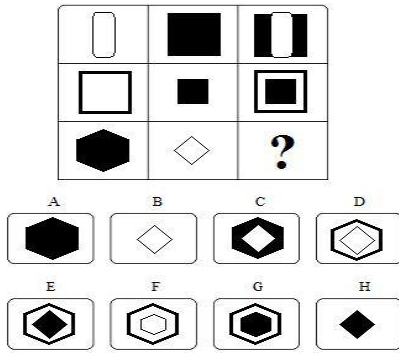
Address, bit, computer, cursor, desktop, drive, e-mail, disk,



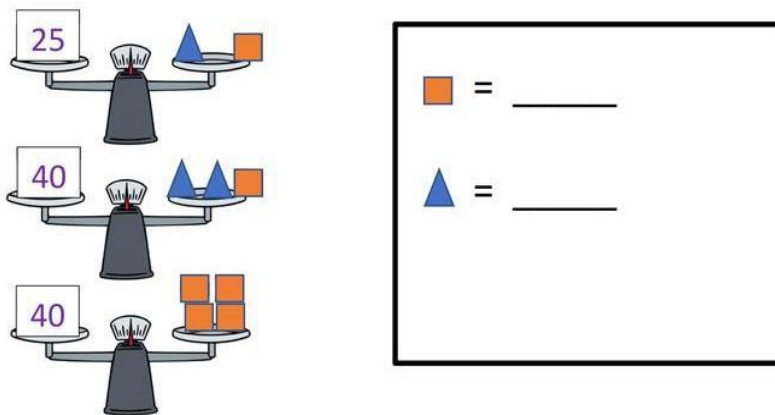
6. താഴെ കൊടുത്തിരിക്കുന്ന കപ്പുകളിൽ ആദ്യം നിറയുന്നത് ഏതാണെന്ന് എഴുതുക



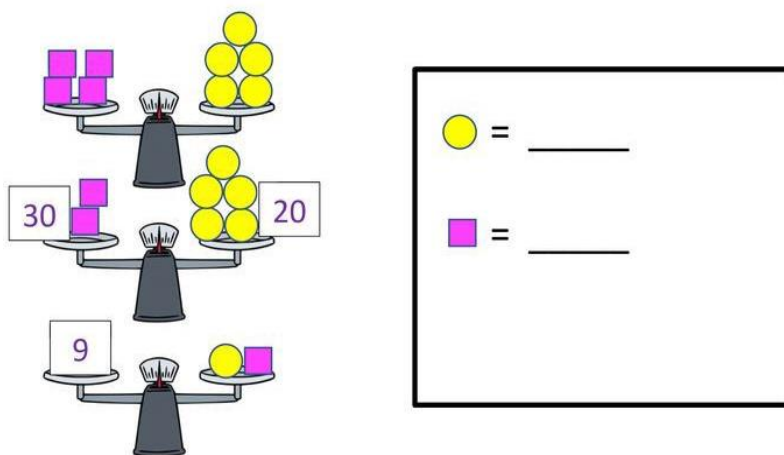
7. താഴെ കൊടുത്തിരിക്കുന്ന പാറ്റേൺ പൂർത്തീകരിക്കുക



8. ഓരോ ആകൃതിയുടെയും മൂല്യം കണ്ടെത്തുക



9. ഓരോ ആകൃതിയുടെയും മൂല്യം കണ്ടെത്തുക



10. താഴെ തന്നിരിക്കുന്ന ട്രാഫിക് സിഗ്നൽ എന്താണ് ഉദ്ദേശിക്കുന്നതെന്നു എഴുതുക





11. താഴെ പറയുന്ന റയിൽവേ സമയങ്ങളെ സാധാരണ സമയമാക്കി എഴുതുക

- 16.20
- 22.40
- 13.11
- 17.55

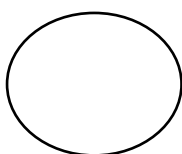
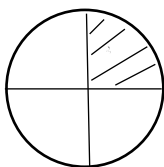
വിട്ടു പോയ സംഖ്യ കണ്ടെത്തുക

12. 1, 3, 5, __, 9, 11
13. 49, __, 63, 70, 77
14. 98, 93, 87, 80, __, 65
15. 12, 24, __, 96, 125
16. 10, 15, 13, 18, 16, __

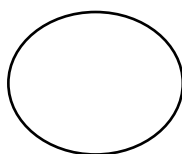
രാജു, സീത, അമല, ഫാത്തിമ, അലക്സ് എന്നിവർക്ക് കിട്ടിയ കേക്കിന്റെ അളവ് ഭിന്ന സംഖ്യയിൽ കൊടുത്തിരിക്കുന്നു

നം	പേര്	കേക്കിന്റെ അളവ് (ഭിന്ന സംഖ്യയിൽ)
1	രാജു	$\frac{1}{4}$
2	സീത	$\frac{1}{2}$
3	അമല	$\frac{1}{3}$
4	ഫാത്തിമ	$\frac{1}{6}$
5	അലക്സ്	$\frac{1}{5}$

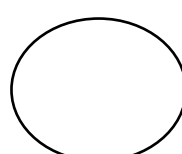
രാജുവിന് കിട്ടിയ കേക്ക് ചുവടെ കാണിച്ചിരിക്കുന്ന ഷേഡ് ഭാഗം ആണെങ്കിൽ. ബാക്കി ഉള്ളവർക്ക് കിട്ടിയ കേക്കിന്റെ അളവ് വരയ്ക്കുക



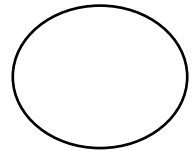
17. സീത



18 . അമല



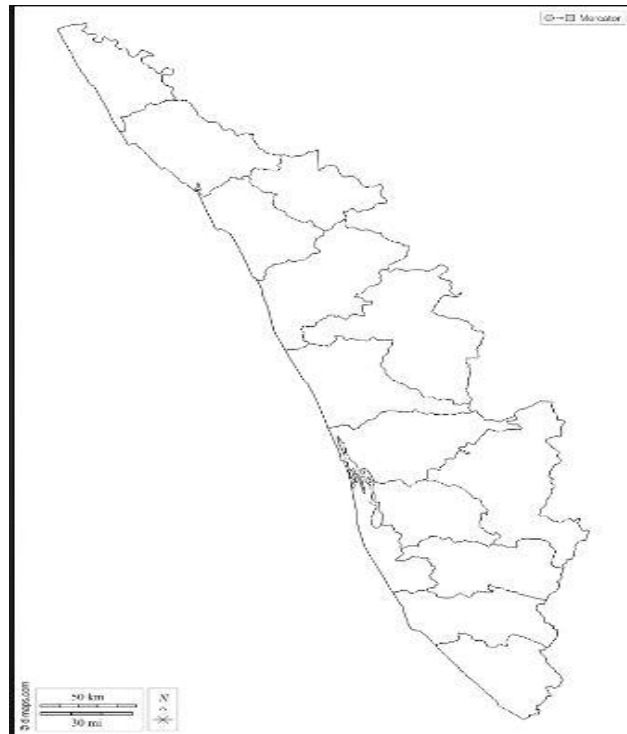
19 . ഫാത്തിമ



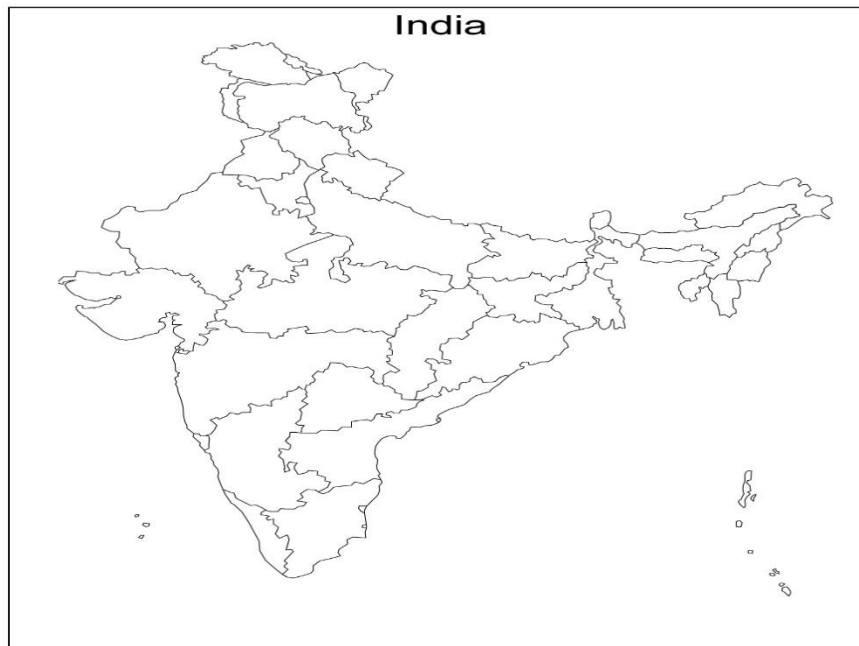
20 . അലക്സ്

ചുവടെ കൊടുത്തിരിക്കുന്ന ചോദ്യങ്ങൾക്കുള്ള ഉത്തരം കണ്ടെത്തി മാപ്പിൽ മാർക്ക് ചെയ്യുക

21. സൈലന്റ് വാലി സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക
22. മൂന്നാർ സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക
23. എടക്കൽ ഗുഹ സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക
24. “അറബിക്കടലിന്റെ റാണി” എന്ന് അറിയപ്പെടുന്ന സ്ഥലം സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക



താഴെ പറയുന്ന തലസ്ഥാനങ്ങൾ വായിച്ചു സംസ്ഥാനങ്ങൾ അടയാളപ്പെടുത്തുക



25. കൊൽക്കത്ത

26. ഗാന്ധിനഗർ

27. അഗർത്തല

28. പാറ്റ്ന

29. ഷിംല

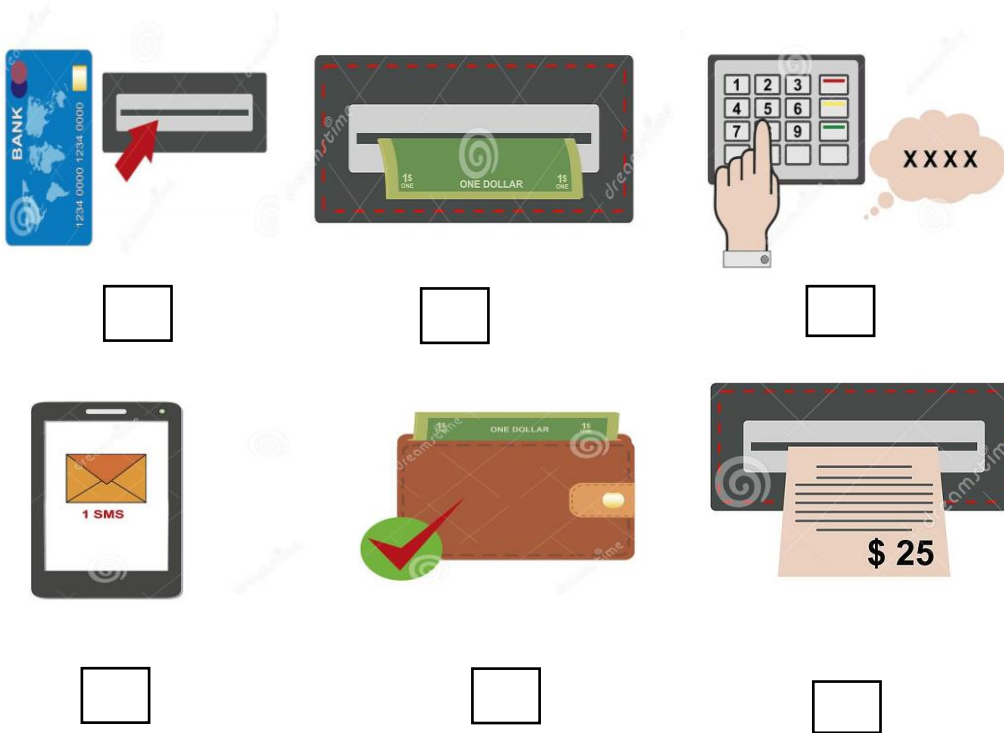
30. ORNAMENTS എന്നുള്ള പദത്തിനെ 643275891 എന്ന് എഴുതാമെങ്കിൽ NAMES എന്നുള്ള പദത്തെ എങ്ങനെ എഴുതാം

- ☐ 35721
- ☐ 32751
- ☐ 65721
- ☐ 52761

31. വിട്ടു പോയ ഭാഗം പൂരിപ്പിക്കുക?

$$\begin{array}{l}
 \text{Rainbow} + \text{Rainbow} = 8 \\
 \text{Rainbow} + \text{Cat} = 10 \\
 \text{Cat} - 5 = 2 \\
 \text{Rainbow} + \text{Cat} + \text{Cat} = \boxed{}
 \end{array}$$

32. ATM ൽ നിന്നും പൈസ എടുക്കുന്ന പ്രക്രിയ ആണ് ചുവടെ കൊടുത്തിരിക്കുന്നത് ഈ ചിത്രങ്ങൾ ശരിയായ ക്രമത്തിൽ ക്രമീകരിക്കുക



33. താഴെ കൊടുത്തിരിക്കുന്ന സന്ദർഭങ്ങളിൽ ഉചിതമായി ചെയ്യേണ്ട കാര്യം ഏതെന്ന് എഴുതുക



- ടൂത്ത്പേസ്റ്റ് തേയ്ക്കുക
- തുണി കൊണ്ട് പൊളിയ ഭാഗം മുറുക്കി കെട്ടുക
- തണുത്ത വെള്ളം കൊണ്ട് പൊളിച്ച ഭാഗം കഴുക
- പൊളിയ ഭാഗത്ത് തടവി കൊടുക്കുക

34.

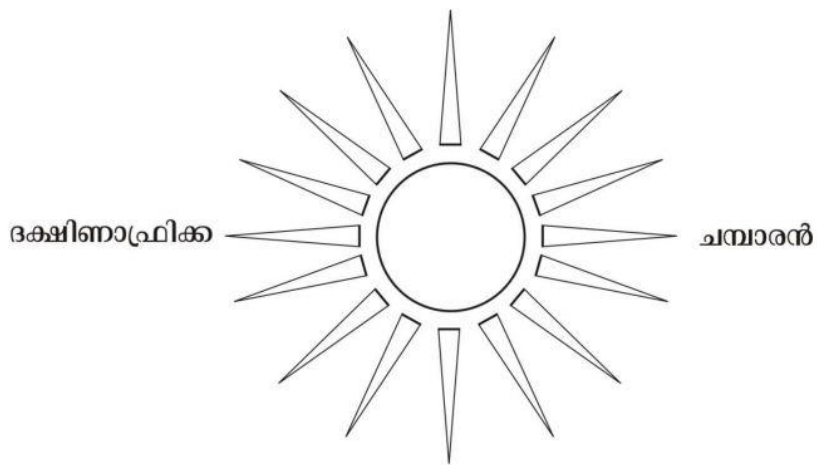


- ഷോക്കേറ്റു ആളുടെ കൈകൾ പിടിച്ചു വലിക്കുക
 - വൈദ്യുതി ബന്ധം വിച്ഛേദിക്കുക
 - ഷോക്കേറ്റു ആൾക്ക് വെള്ളം കൊടുക്കുക
 - ഷോക്കേറ്റു ആൾക്ക് മരുന്ന് കൊടുക്കുക
35. താഴെ കൊടുത്തിരിക്കുന്ന സന്ദർഭങ്ങൾ നിയമവിരുദ്ധമാണോ അല്ലെങ്കിലോ എന്ന് എഴുതുക
- റോഡിൽ റെഡ് ലൈറ്റ് കത്തുമ്പോൾ വണ്ടി ഓടിക്കുന്നു
 - രാത്രി സമയത്ത് പുറത്തിറങ്ങി നടക്കുന്നത്
 - വണ്ടികൾ ഉള്ളപ്പോൾ സീബ്ര ലൈൻ വഴി റോഡ് മുറിച്ചു കടക്കുന്നു
 - പൊതു സ്ഥലങ്ങളിൽ വെച്ച് ലഹരി വസ്തുക്കൾ ഉപയോഗിക്കുന്നത്
36. എനിക്ക് ഒരു പ്രശ്നം വന്നാൽ, മറ്റുള്ളവരോട് സഹായം ചോദിക്കുന്നതിന് മുമ്പ് ഞാൻ തന്നെ പരിഹാരം കണ്ടെത്താൻ ശ്രമിക്കുന്നു.
- ☐ എപ്പോഴും ☐ ചിലപ്പോൾ ☐ ഒരിക്കലും ഇല്ല
37. ഞാൻ പിഴവ് ചെയ്താൽ, ശാന്തമായി ഇരുന്നു അത് തിരുത്താൻ ശ്രമിക്കുന്നു.
- ☐ എപ്പോഴും ☐ ചിലപ്പോൾ ☐ ഒരിക്കലും ഇല്ല

Appendix S

Life Skills Assessment Tool for Upper Primary (English Version – Draft)

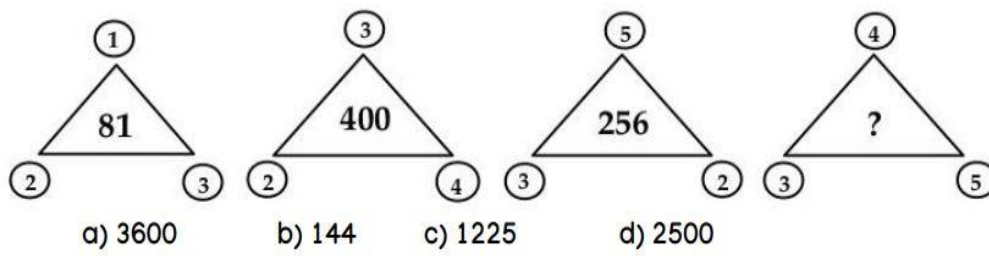
1. Elaborate on the ideologies associated with Mahatma Gandhi



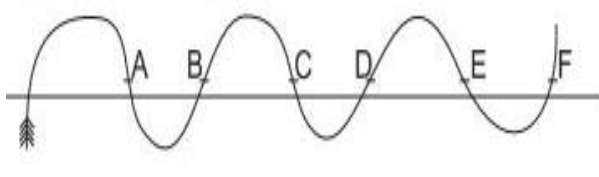
2. Choose the words used to describe places

clean	hilly	old
cold	hot	quiet
colourful	humid	rural
cool	industrial	sandy
crowded	modern	urban
dirty	mountainous	windy
flat	narrow	

3. Find the missing number



4. In the picture given below, which parts need to be cut to make 4 new saplings?



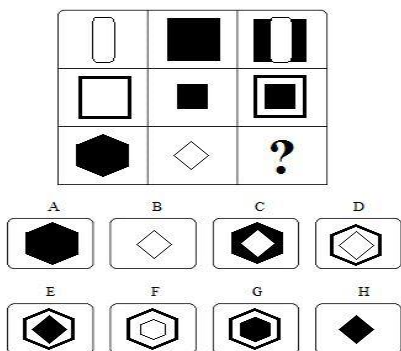
5. Find the following words: Address, bit, computer, cursor, desktop, drive, e-mail, disk.



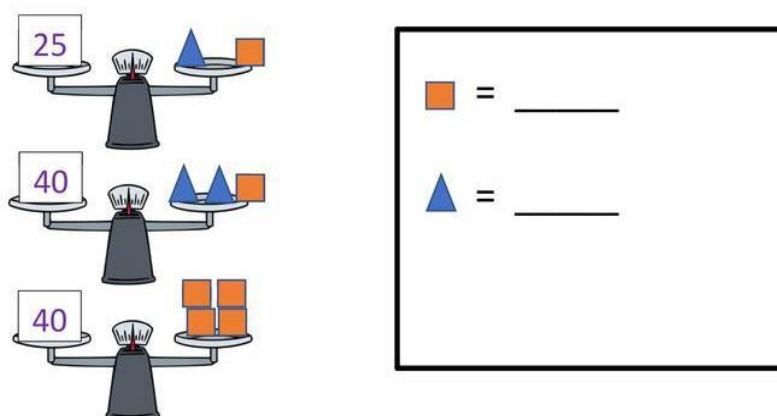
6. Write which of the cups below fills first



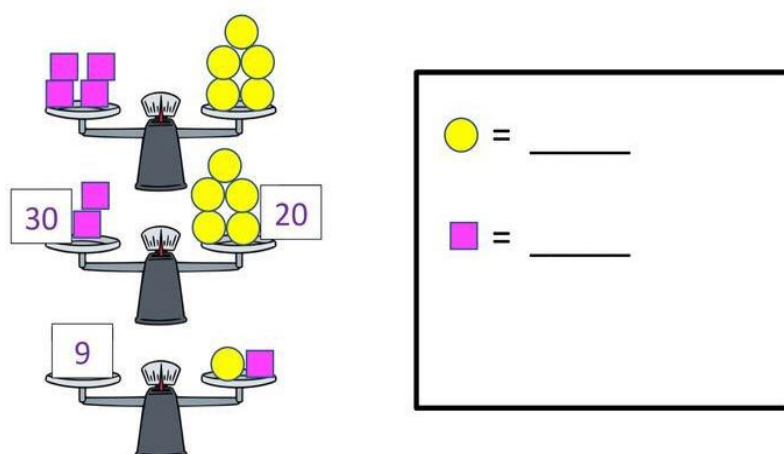
7. Complete the pattern given below.



8. Find the value of each shape



9. Find the value of each shape



10. Write what the traffic signal given below indicates.



11. Convert the following railway times into standard (12-hour) time.

- 16.20
- 22.40
- 13.11
- 17.55

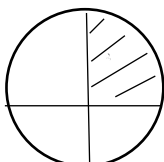
Find the missing number

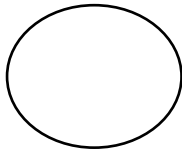
12. 1, 3, 5, __, 9, 11
13. 49, __, 63, 70, 77
14. 98, 93, 87, 80, __, 65
15. 12, 24, __, 96, 125
16. 10, 15, 13, 18, 16, __

The amount of cake received by Raju, Sita, Amala, Fathima, and Alex is given in fractions

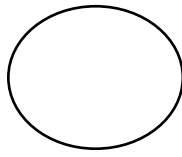
Sl.No	Name	Cake quantity (in fractions)
1	Raju	$\frac{1}{4}$
2	Seetha	$\frac{1}{2}$
3	Amala	$\frac{1}{3}$
4	Fathima	$\frac{1}{6}$
5	Alex	$\frac{1}{5}$

If the shaded part shown below is the piece of cake Raju received, draw the portion of cake received by the others.

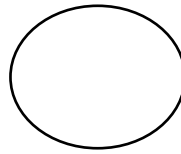




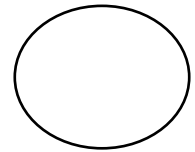
17. Seetha



18 . Amala



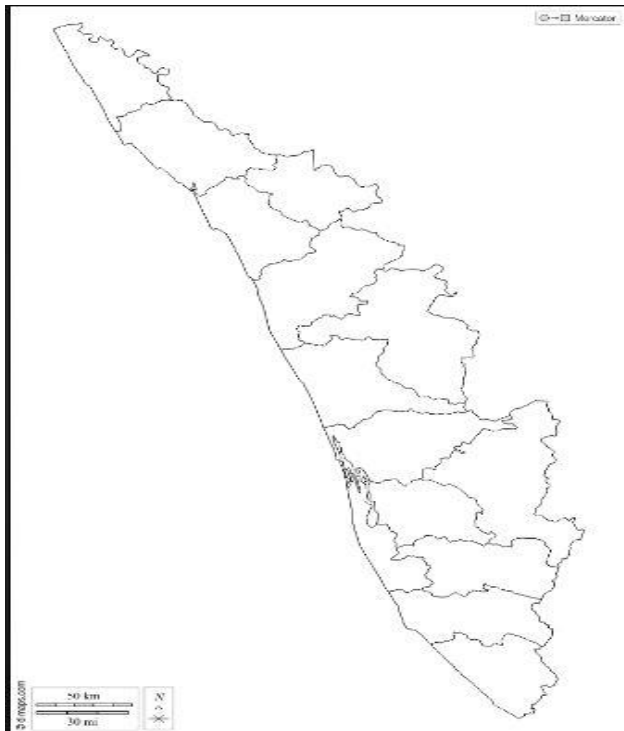
19 . Fathima



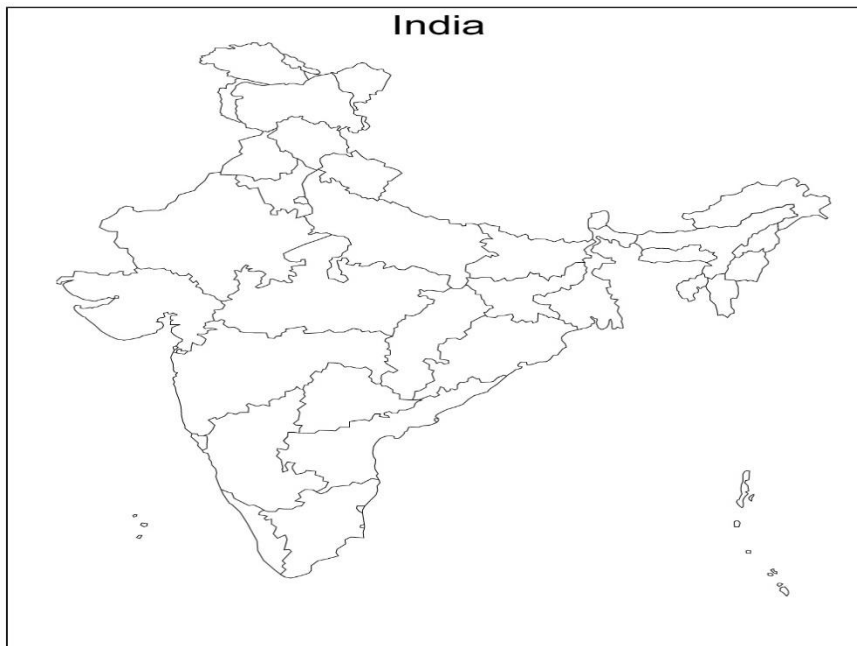
20 . Alex

Find the answers to the questions given below and mark them on the map

21. Mark the district in which Silent Valley is located.
22. Mark the district in which Munnar is located.
23. Mark the district in which Edakkal Cave is located.
24. Mark the district where the place known as the "Queen of the Arabian Sea" is located.



Read the following capitals and mark the corresponding states.



25. Kolkata

26. Gandhinagar

27. Agartala

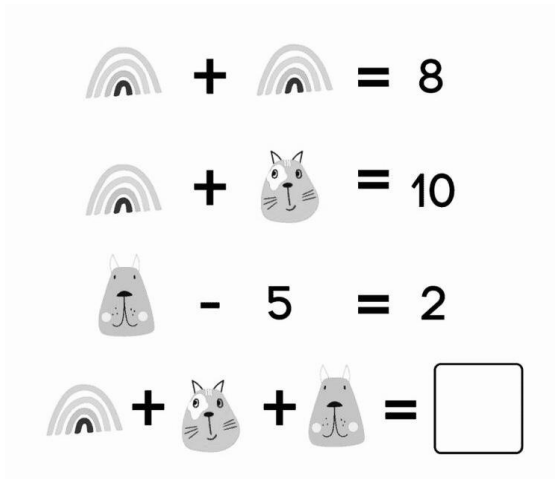
28. Patna

29. Shimla

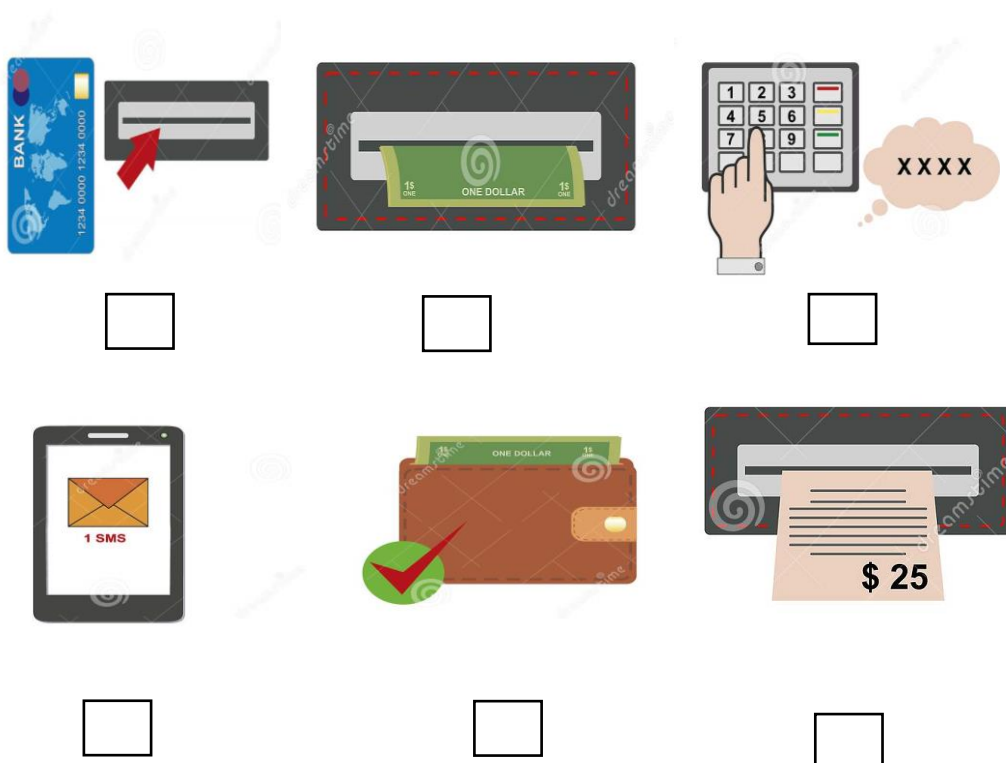
30. If the word **ORNAMENTS** can be written as **643275891**, how can the word **NAMES** be written?

- ☐ 35721
- ☐ 32751
- ☐ 65721
- ☐ 52761

31. Fill in the missing part



32. The process of withdrawing money from an ATM is shown below. Arrange these pictures in the correct order.



33. Write what appropriate action should be taken in each of the situations given below.



- Apply toothpaste
- Tie the burnt area tightly with a cloth
- Wash the burnt area with cold water
- Apply ointment on the burnt area

34.



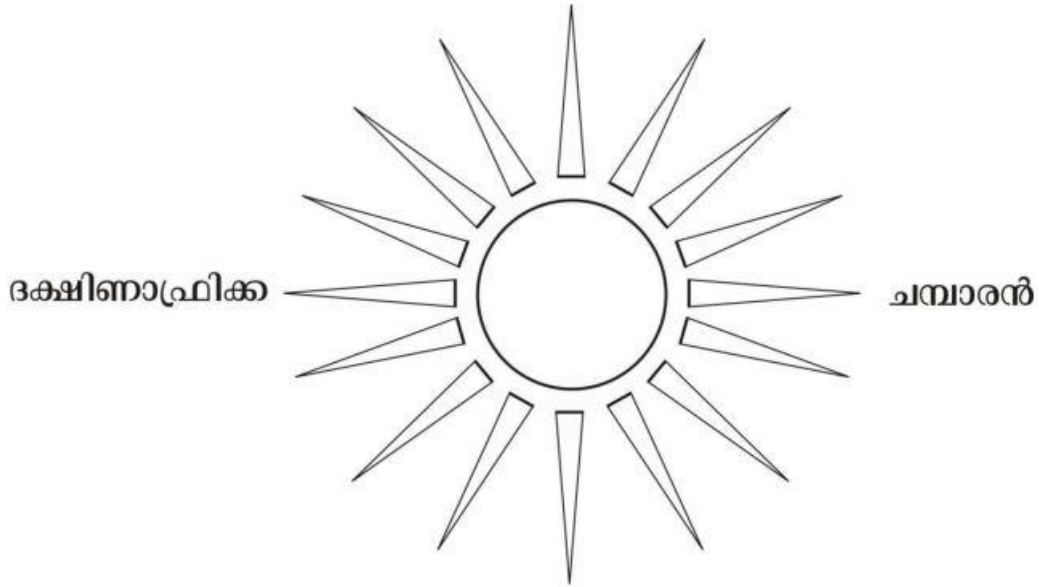
- Pull the shocked person's hands
- Disconnect the power supply
- Give water to the shocked person
- Give medicine to the shocked person

35. Write whether the following situations are illegal or not.

- Driving a vehicle when the red light is on
- Walking outside at night
- Crossing the road using the zebra line even when vehicles are coming
- Using intoxicating substances in public places

Appendix T
Life Skills Assessment Tool for Upper Primary (Malayalam Version – Draft)

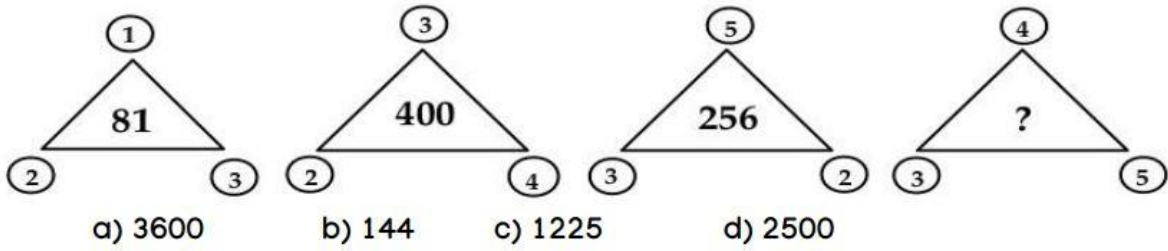
1. മഹാത്മ ഗാന്ധിയുമായി ബന്ധപ്പെട്ട ആശയസൂര്യൻ വിപുലീകരിക്കുക



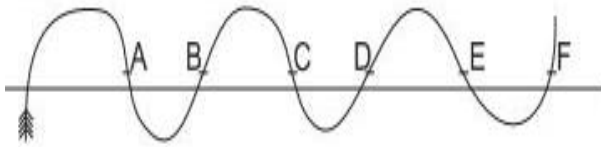
2. സ്ഥലങ്ങളെ വിവരിക്കാൻ ഉപയോഗിക്കുന്ന വാക്കുകൾ തിരഞ്ഞെടുക്കുക

clean	hilly	old
cold	hot	quiet
colourful	humid	rural
cool	industrial	sandy
crowded	modern	urban
dirty	mountainous	windy
flat	narrow	

3. വിട്ടു പോയ സംഖ്യ കണ്ടെത്തുക



4. താഴെ പറയുന്ന ചിത്രത്തിൽ 4 പുതിയ തൈകൾ ഉണ്ടാക്കാൻ മുറിക്കേണ്ട ഭാഗങ്ങൾ ഏതാണ്?



- A) ACE B) ACD C) BDEF D) ABCDEF
5. താഴെ കൊടുത്തിരിക്കുന്ന പദങ്ങൾ കണ്ടെത്തുക

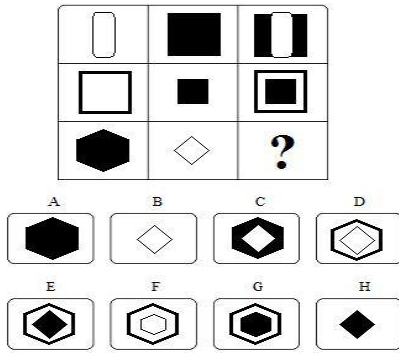
Address, bit, computer, cursor, desktop, drive, e-mail, disk,



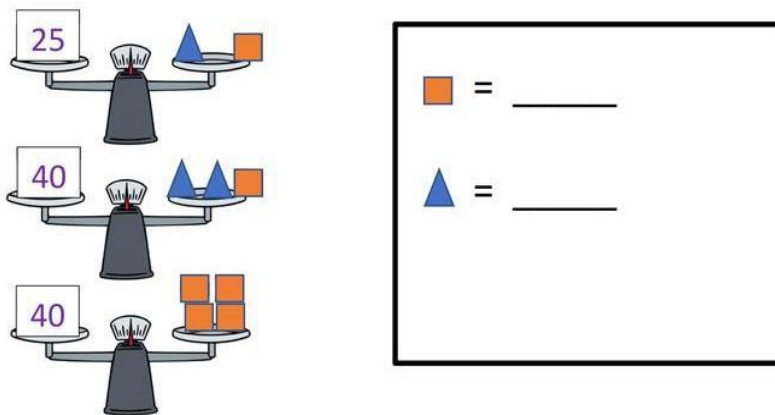
6. താഴെ കൊടുത്തിരിക്കുന്ന കപ്പുകളിൽ ആദ്യം നിറയുന്നത് ഏതാണെന്നു എഴുതുക



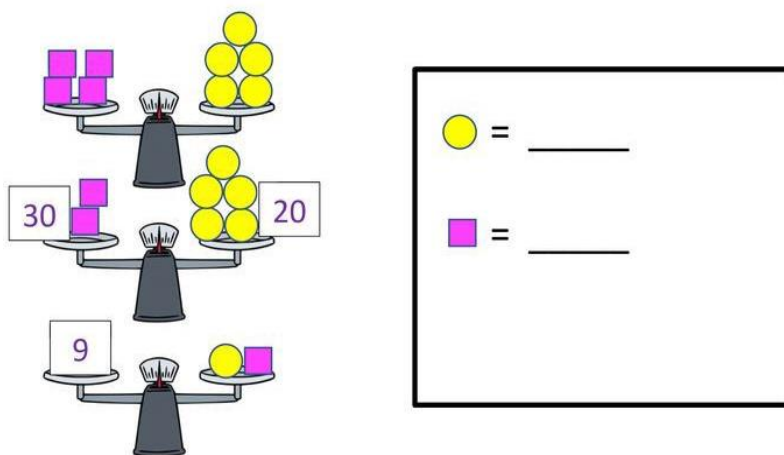
7. താഴെ കൊടുത്തിരിക്കുന്ന പാറ്റേൺ പൂർത്തീകരിക്കുക



8. ഓരോ ആകൃതിയുടെയും മൂല്യം കണ്ടെത്തുക



9. ഓരോ ആകൃതിയുടെയും മൂല്യം കണ്ടെത്തുക



10. താഴെ തന്നിരിക്കുന്ന ട്രാഫിക് സിഗ്നൽ എന്താണ് ഉദ്ദേശിക്കുന്നതെന്ന് എഴുതുക





11. താഴെ പറയുന്ന റയിൽവേ സമയങ്ങളെ സാധാരണ സമയമാക്കി എഴുതുക

- 16.20
- 22.40
- 13.11
- 17.55

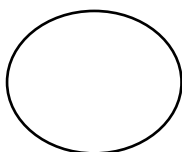
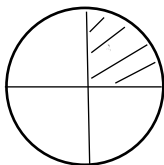
വിട്ടു പോയ സംഖ്യ കണ്ടെത്തുക

- 12. 1, 3, 5, __, 9, 11
- 13. 49, __, 63, 70, 77
- 14. 98, 93, 87, 80, __, 65
- 15. 12, 24, __, 96, 125
- 16. 10, 15, 13, 18, 16, __

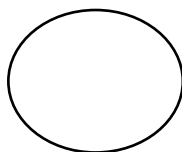
രാജു, സീത, അമല, ഫാത്തിമ, അലക്സ് എന്നിവർക്ക് കിട്ടിയ കേക്കിന്റെ അളവ് ഭിന്ന സംഖ്യയിൽ കൊടുത്തിരിക്കുന്നു

നം	പേര്	കേക്കിന്റെ അളവ് (ഭിന്ന സംഖ്യയിൽ)
1	രാജു	$\frac{1}{4}$
2	സീത	$\frac{1}{2}$
3	അമല	$\frac{1}{3}$
4	ഫാത്തിമ	$\frac{1}{6}$
5	അലക്സ്	$\frac{1}{5}$

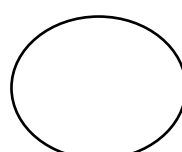
രാജുവിന് കിട്ടിയ കേക്ക് ചുവടെ കാണിച്ചിരിക്കുന്ന ഷേഡ് ഭാഗം ആണെങ്കിൽ. ബാക്കി ഉള്ളവർക്ക് കിട്ടിയ കേക്കിന്റെ അളവ് വരയ്ക്കുക



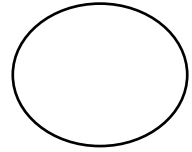
17. സീത



18 . അമല



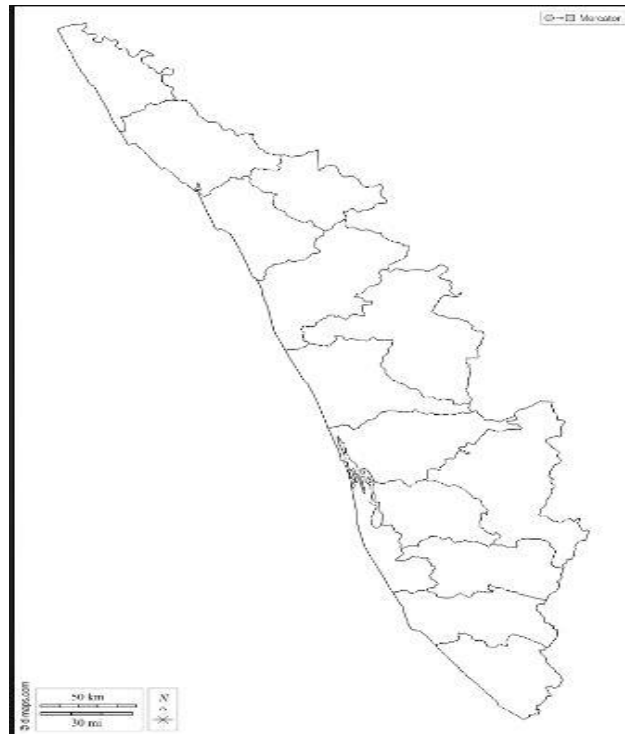
19 . ഫാത്തിമ



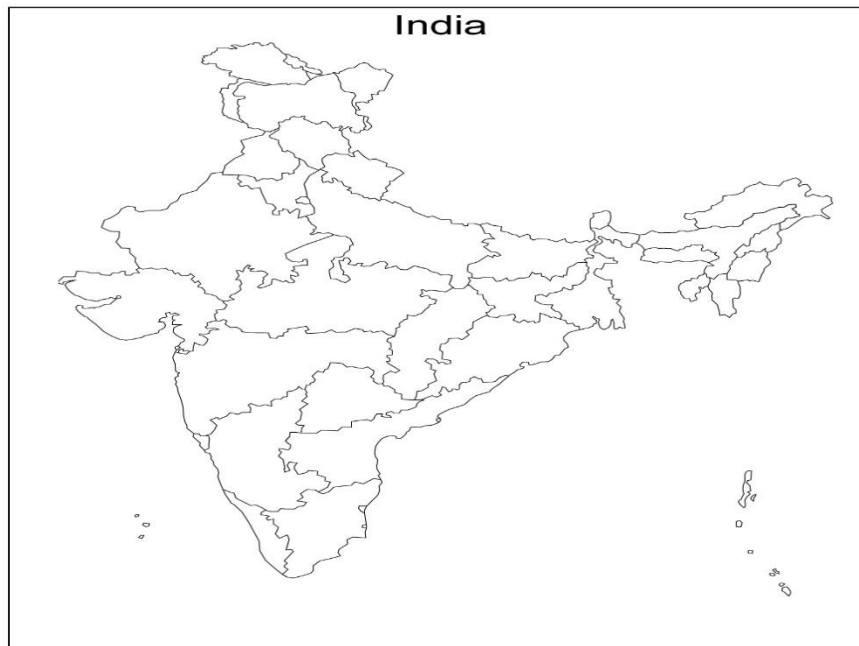
20 . അലക്സ്

ചുവടെ കൊടുത്തിരിക്കുന്ന ചോദ്യങ്ങൾക്കുള്ള ഉത്തരം കണ്ടെത്തി മാപ്പിൽ മാർക്ക് ചെയ്യുക

21. സൈലന്റ് വാലി സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക
22. മൂന്നാർ സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക
23. എടക്കൽ ഗുഹ സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക
24. “അറബിക്കടലിന്റെ റാണി” എന്ന് അറിയപ്പെടുന്ന സ്ഥലം സ്ഥിതി ചെയ്യുന്ന ജില്ല മാർക്ക് ചെയ്യുക



താഴെ പറയുന്ന തലസ്ഥാനങ്ങൾ വായിച്ചു സംസ്ഥാനങ്ങൾ അടയാളപ്പെടുത്തുക



25. കൊൽക്കത്ത

26. ഗാന്ധിനഗർ

27. അഗർത്തല

28. പാറ്റ്ന

29. ഷിംല

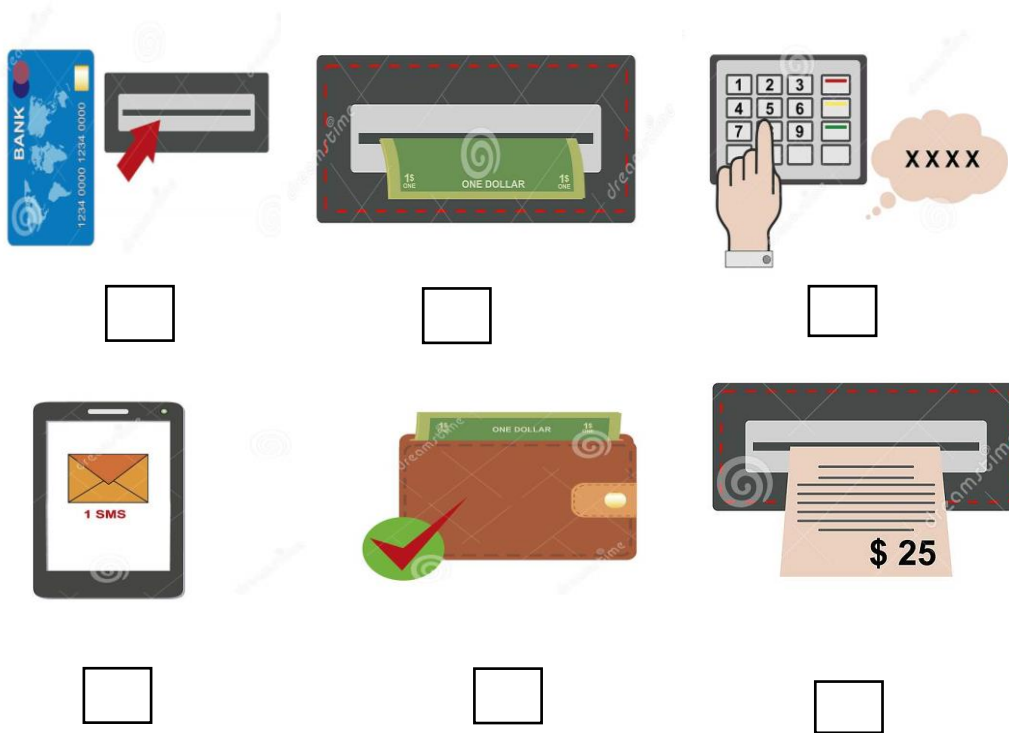
30. ORNAMENTS എന്നുള്ള പദത്തിനെ 643275891 എന്ന് എഴുതാമെങ്കിൽ NAMES എന്നുള്ള പദത്തെ എങ്ങനെ എഴുതാം

- ☐ 35721
- ☐ 32751
- ☐ 65721
- ☐ 52761

31. വിട്ടു പോയ ഭാഗം പൂരിപ്പിക്കുക?

$$\begin{array}{rcl}
 \text{Rainbow} & + & \text{Rainbow} = 8 \\
 \text{Rainbow} & + & \text{Cat} = 10 \\
 \text{Cat} & - & 5 = 2 \\
 \text{Rainbow} & + & \text{Cat} + \text{Cat} = \boxed{}
 \end{array}$$

32. ATM ൽ നിന്നും പൈസ എടുക്കുന്ന പ്രക്രിയ ആണ് ചുവടെ കൊടുത്തിരിക്കുന്നത് ഈ ചിത്രങ്ങൾ ശരിയായ ക്രമത്തിൽ ക്രമീകരിക്കുക



33. താഴെ കൊടുത്തിരിക്കുന്ന സന്ദർഭങ്ങളിൽ ഉചിതമായി ചെയ്യേണ്ട കാര്യം ഏതെന്ന് എഴുതുക



- ടൂത്ത്പേസ്റ്റ് തേയ്ക്കുക
- തുണി കൊണ്ട് പൊളിയ ഭാഗം മൃദുക്കി കെട്ടുക
- തണുത്ത വെള്ളം കൊണ്ട് പൊളിയ ഭാഗം കഴുക
- പൊളിയ ഭാഗത്ത് തടവി കൊടുക്കുക

34.

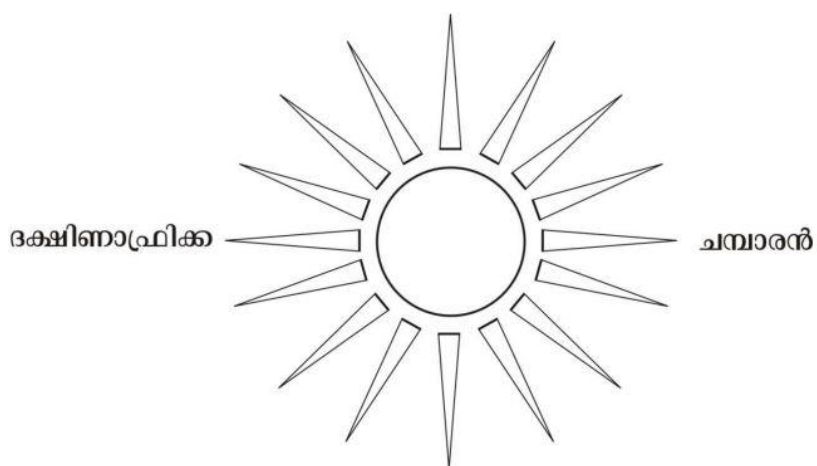


- ഷോക്കേറ്റു ആളുടെ കൈകൾ പിടിച്ചു വലിക്കുക
 - വൈദ്യുതി ബന്ധം വിച്ഛേദിക്കുക
 - ഷോക്കേറ്റു ആൾക്ക് വെള്ളം കൊടുക്കുക
 - ഷോക്കേറ്റു ആൾക്ക് മരുന്ന് കൊടുക്കുക
35. താഴെ കൊടുത്തിരിക്കുന്ന സന്ദർഭങ്ങൾ നിയമവിരുദ്ധമാണോ അല്ലെങ്കിലോ എന്ന് എഴുതുക
- റോഡിൽ റെഡ് ലൈറ്റ് കത്തുമ്പോൾ വണ്ടി ഓടിക്കുന്നു
 - രാത്രി സമയത്ത് പുറത്തിറങ്ങി നടക്കുന്നത്
 - വണ്ടികൾ ഉള്ളപ്പോഴും സീബ്ര ലൈൻ വഴി റോഡ് മുറിച്ചു കടക്കുന്നു
 - പൊതു സ്ഥലങ്ങളിൽ വെച്ച് ലഹരി വസ്തുക്കൾ ഉപയോഗിക്കുന്നത്
36. എനിക്ക് ഒരു പ്രശ്നം വന്നാൽ, മറ്റുള്ളവരോട് സഹായം ചോദിക്കുന്നതിന് മുമ്പ് ഞാൻ തന്നെ പരിഹാരം കണ്ടെത്താൻ ശ്രമിക്കുന്നു.
- ☐ എപ്പോഴും ☐ ചിലപ്പോൾ ☐ ഒരിക്കലും ഇല്ല
37. ഞാൻ പിഴവ് ചെയ്താൽ, ശാന്തമായി ഇരുന്നു അത് തിരുത്താൻ ശ്രമിക്കുന്നു.
- ☐ എപ്പോഴും ☐ ചിലപ്പോൾ ☐ ഒരിക്കലും ഇല്ല

Appendix U

Life Skills Assessment Tool for Upper Primary (English Version – Draft)

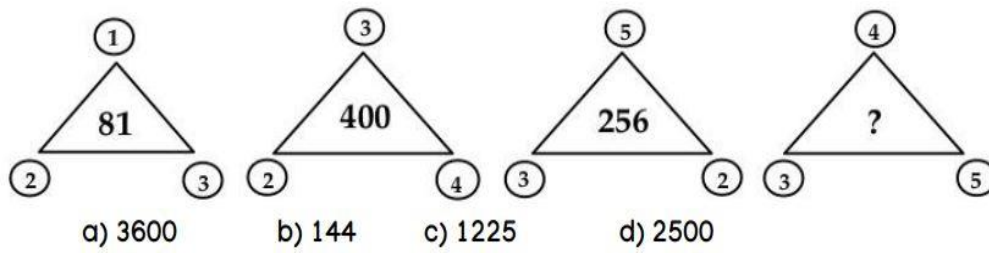
1. Elaborate on the ideologies associated with Mahatma Gandhi



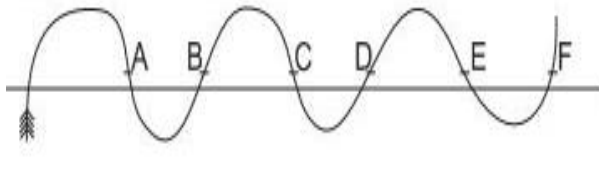
2. Choose the words used to describe places

clean	hilly	old
cold	hot	quiet
colourful	humid	rural
cool	industrial	sandy
crowded	modern	urban
dirty	mountainous	windy
flat	narrow	

3. Find the missing number



4. In the picture given below, which parts need to be cut to make 4 new saplings?



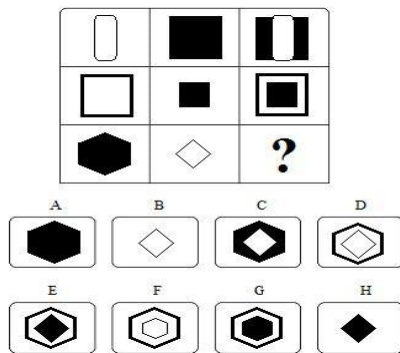
5. Find the following words: Address, bit, computer, cursor, desktop, drive, e-mail, disk.



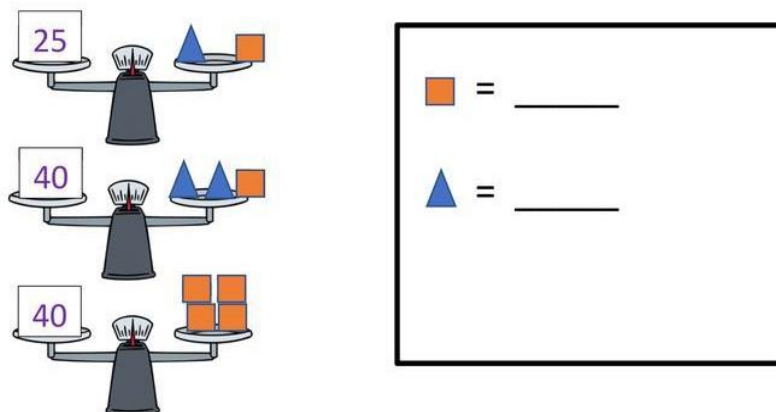
6. Write which of the cups below fills first



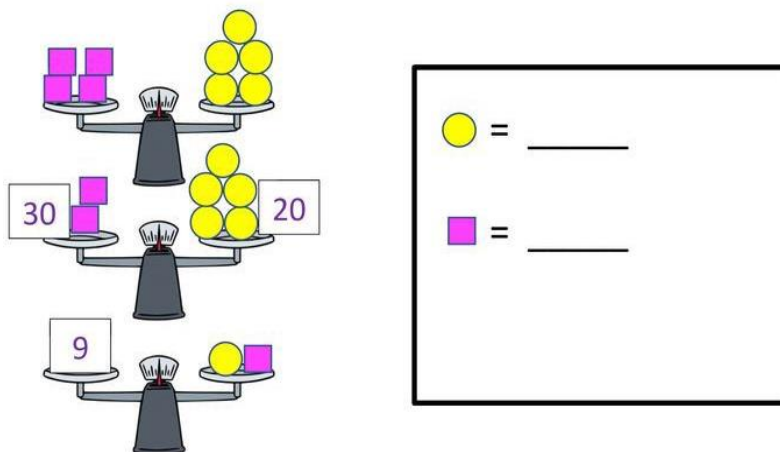
7. Complete the pattern given below.



8. Find the value of each shape



9. Find the value of each shape



10. Write what the traffic signal given below indicates.



11. Convert the following railway times into standard (12-hour) time.

- 16.20
- 22.40
- 13.11
- 17.55

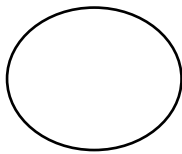
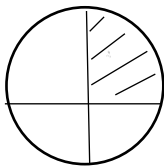
Find the missing number

12. 1, 3, 5, __, 9, 11
13. 49, __, 63, 70, 77
14. 98, 93, 87, 80, __, 65
15. 12, 24, __, 96, 125
16. 10, 15, 13, 18, 16, __

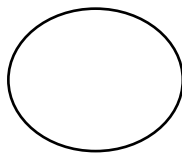
The amount of cake received by Raju, Sita, Amala, Fathima, and Alex is given in fractions

Sl.No	Name	Cake quantity (in fractions)
1	Raju	$\frac{1}{4}$
2	Seetha	$\frac{1}{2}$
3	Amala	$\frac{1}{3}$
4	Fathima	$\frac{1}{6}$
5	Alex	$\frac{1}{5}$

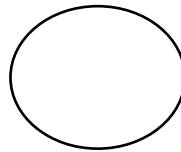
If the shaded part shown below is the piece of cake Raju received, draw the portion of cake received by the others.



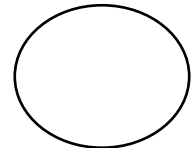
17. Seetha



18 . Amala



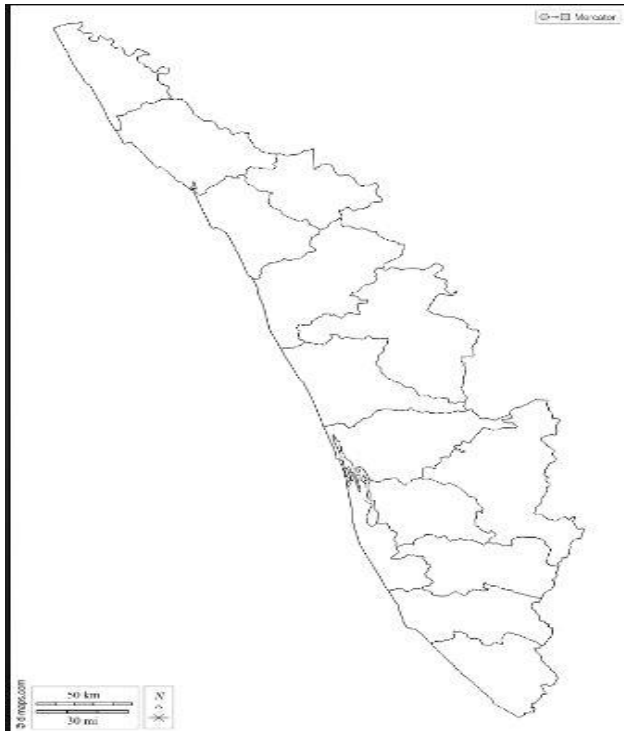
19 . Fathima



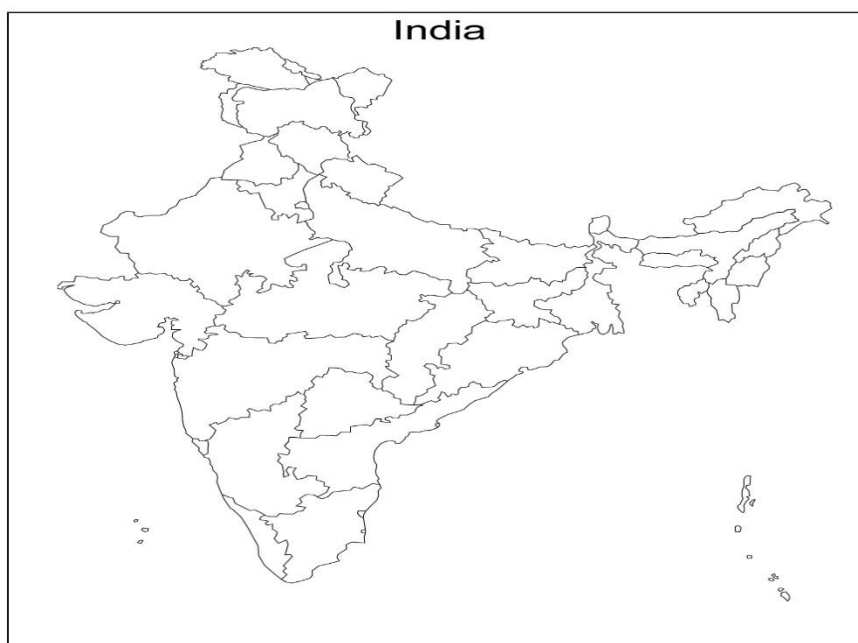
20 . Alex

Find the answers to the questions given below and mark them on the map

21. Mark the district in which Silent Valley is located.
22. Mark the district in which Munnar is located.
23. Mark the district in which Edakkal Cave is located.
24. Mark the district where the place known as the "Queen of the Arabian Sea" is located.



Read the following capitals and mark the corresponding states.



25. Kolkata

26. Gandhinagar

27. Agartala

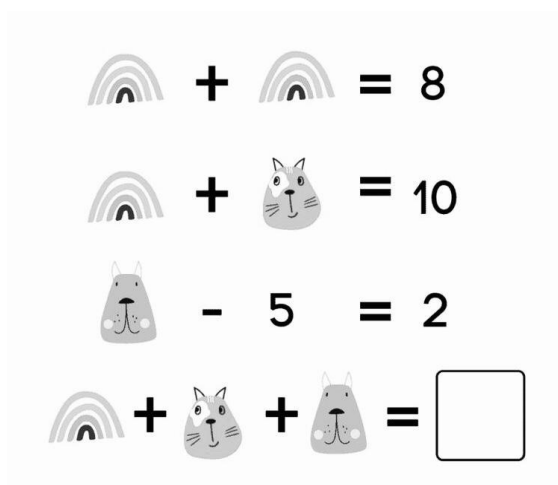
28. Patna

29. Shimla

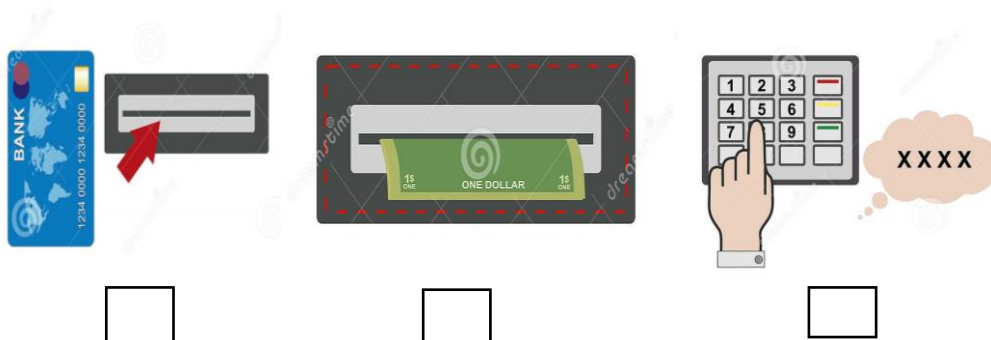
30. If the word **ORNAMENTS** can be written as **643275891**, how can the word **NAMES** be written?

- 35721
- 32751
- 65721
- 52761

31. Fill in the missing part



32. The process of withdrawing money from an ATM is shown below. Arrange these pictures in the correct order.




☐

☐

☐

33. Write what appropriate action should be taken in each of the situations given below.



- Apply toothpaste
- Tie the burnt area tightly with a cloth
- Wash the burnt area with cold water
- Apply ointment on the burnt area

34.



- Pull the shocked person's hands
- Disconnect the power supply
- Give water to the shocked person
- Give medicine to the shocked person

35. Write whether the following situations are illegal or not.

- Driving a vehicle when the red light is on
- Walking outside at night
- Crossing the road using the zebra line even when vehicles are coming
- Using intoxicating substances in public places

FINDINGS, SUGGESTIONS AND CONCLUSION

-
- *Study in Retrospect*
 - *Re-statement of the Problem*
 - *Variables of the Study*
 - *Objectives of the Study*
 - *Methods of the Study*
 - *Major findings of the Study*
 - *Tenability of the Hypotheses*
 - *Limitations of the study*
 - *Delimitation of the study*
 - *Conclusion*
-

The chapter presents the summarized version of the research conducted. Suggestions and some recommendations based on this research.

Study in Retrospect

The present study was undertaken with the primary objective of developing a contextualized framework for Attappadi through the localisation of the Sustainable Development Goals (SDGs), with particular emphasis on SDG 4: Quality Education. The framework was designed to align global educational targets with the socio-cultural and developmental realities of the Attappadi tribal region. In addition to the framework development and validation processes, an impact assessment was conducted to evaluate the changes that occurred in Attappadi's educational ecosystem following the implementation of the Localised Sustainable Development Goals (LSDGs) approach.

Re-statement of the Problem

The present the study is entitled as “Development and validation of a localised sustainable development goals framework for quality education and evaluating its effect on Students from Tribal Communities in Attappadi”.

Variables of the Study

For the present study the following variables are in view:

Independent variable

- LSDGs-based intervention

Dependent variables

- Teachers' relationship with Children
- Learning quality of children
- Academic Achievement
- Life skills

Objectives of the Study

Qualitative Objectives

1. To examine the current status of quality education among Students from Tribal Communities in Attappadi in the context of Sustainable Development Goal 4 (SDGs–Quality Education) before the implementation stage of LSDGs
2. To design and develop a localised Sustainable Development Goals (LSDGs) framework tailored to the socio-cultural and educational context of Attappadi.
3. To validate the developed LSDGs framework through expert evaluation, pilot testing, and stakeholder feedback.
4. To find out the status of quality education among Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Teachers' Relationship with Children
 - Before the implementation of LSDGs
5. To find out the status of quality education among Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Teachers' Relationship with Children
 - after the implementation of LSDGs

6. To compare the status of quality education among Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Teachers' Relationship with Children
 - Before and after the implementation of LSDGs
7. To find out the status of quality education among Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Learning Quality of Children
 - before the implementation of LSDGs
8. To find out the status of quality education among Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Learning Quality of Children
 - after the implementation of LSDGs
9. To compare the status of quality education among Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Learning Quality of Children
 - Before and after the implementation of LSDGs

Quantitative Objectives

10. To compare the status of quality education among lower primary Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - their Achievement
 - Before, during, and after the implementation of LSDGs

11. To compare the status of quality education among upper primary Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - their Achievement
 - Before, during, and after the implementation of LSDGs
12. To compare the status of quality education among high school Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - their Achievement
 - Before, during, and after the implementation of LSDGs
13. To find out the status of quality education among lower primary Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Life skills development
 - Before, during, and after the implementation of LSDGs
14. To find out the status of quality education among upper primary Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Life skills development
 - Before, during, and after the implementation of LSDGs
15. To compare the status of quality education among high school Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - Life skills development
 - Before, during, and after the implementation of LSDGs

Qualitative Objective

16. To examine the current status of quality education among Students from Tribal Communities in Attappadi in the context of Sustainable Development Goal 4 (SDGs–Quality Education) after the implementation LSDGs

Hypotheses

1. There exists no significant difference in the mean score of achievement of lower primary Students from Tribal Communities in Attappadi based on the SDGs framework, before, during, and after the implementation of LSDGs
2. There exists no significant difference in the mean score of achievement of upper primary Students from Tribal Communities in Attappadi based on the SDGs framework, before, during, and after the implementation of LSDGs
3. There exists no significant difference in the mean score of achievement of high school Students from Tribal Communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs
4. There exists no significant difference in the status of quality education among high school Students from Tribal Communities in Attappadi based on SDGs framework with respect to
 - the mean scores of their Achievement
 - Before, during, and after the implementation of LSDGs
5. There exists no significant difference in the mean score of life skills of lower primary Students From Tribal Communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs

6. There exists no significant difference in the mean score of life skills of upper primary Students from Tribal Communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs
7. There exists no significant difference in the mean score of life skills of high school Students from Tribal Communities in Attappadi based on SDGs framework before, during, and after the implementation of LSDGs

Methodology of the Study

Method adopted

The present study adopted an explanatory sequential mixed method design.

Population of the study

The tribes among the students of primary, upper primary and secondary schools of Attappadi constitute the population of the present study.

Sample of the study

1259 Students From Tribal Communities from different lower primary, upper primary and secondary schools of Attappadi constituted the sample for the study.

Tools and Techniques Used for the Present Study

The investigator, for the purpose of proceeding the study, used the following tools:

- A tool for assessing The Teachers Relationship with Children
- A tool for assessing the Learning Quality of Children

- SDGs Local Indicator Framework prepared and standardized by the researcher and the guide.
- LSDGs Validation Tool Kit
- Life Skill Assessment Test prepared and standardized by the researcher with the guidance of the research guide
- Document Analysis Schedule
- Semi structured Interview for the Teachers and other stakeholders
- The score obtained by the learners in the annual exam were used as the score for achievement in this study

Statistical Techniques Used for the Study

The following statistical techniques will be used for the analysis of the data:

- Preliminary statistics like mean, median, mode, standard deviation, skewness and kurtosis for testing the normality of the collected data
- Independent sample t-Test,

The following statistical techniques will be used for the analysis of the data:

- Preliminary statistics like mean, median, mode, standard deviation, skewness and kurtosis for testing the normality of the collected data
- Independent sample t-Test,
- Repeated measures of ANOVA
- Test of Sphericity (Mauchly's W)
- Greenhouse–Geisser Correction
- Huynh–Feldt Correction

- QQ Plot
- Normality Test
- Repeated Measures ANOVA
- Bonferroni Post Hoc Test
- Adjusted Post-Test Scores
- Eta Square (η^2)
- Eta Square p
- Partial Eta Square (η^2_p)
- Greenhouse–Gas H -Test
- Taguette QDA: Taguette is an open-source qualitative data analysis tool for coding text, organizing themes, and exporting coded segments.
- Word Cloud Analysis: A word cloud displays the most frequent words in a dataset using font size to show frequency.
- Thematic Network: A thematic network shows relationships between basic themes, organizing themes, and global themes.
- Frequency Bar Chart: A bar chart showing how often names, terms, or codes appear in the data.
- Thematic Intensity Heatmap: A heatmap that shows the density or intensity of themes across participants, groups, or text segments using color gradients.
- Code–Theme–Excerpt

Ethics Approval Statement

This study adhered to standard ethical guidelines for educational research. Informed consent was obtained, confidentiality was maintained, and participants' rights and cultural sensitivity were respected throughout the study.

Major Findings of the Study

- More attention is needed to Academic achievement for the tribes. Most of the selected students lies being 5-mark grade point.

Findings for Objective 1: Status of Quality Education Before LSDGs

1. Quality of education prior to LSDGs implementation was hindered by significant infrastructural limitations, inadequately equipped classrooms, and an absence of ICT facilities.
2. Pedagogical practices were predominantly rote-based, with minimal emphasis on activity-oriented or child-centred instructional strategies.
3. Language barriers posed considerable challenges to effective participation, particularly among first-generation tribal learners transitioning from mother tongue to Malayalam.
4. Assessment procedures were largely informal, inconsistent, and reliant on anecdotal evidence rather than structured evaluation systems.
5. Parental engagement in educational processes was limited, largely due to low literacy levels and socio-economic constraints within the community.
6. Although teachers exhibited strong emotional commitment, they lacked structural and institutional support mechanisms to enhance instructional quality.
7. Learning resources, including libraries and supplementary materials, were insufficient or poorly maintained.

8. Learning quality varied widely across schools and hamlets, reflecting disparities in access, resources, and instructional practices.

Findings for Objective 2: Development of the LSDGs Framework

1. The LSDGs framework was designed by integrating local socio-cultural contexts and indigenous knowledge systems relevant to tribal communities in Attappadi.
2. The framework incorporated key components such as mentoring structures, bilingual instruction, continuous and competency-based assessment, and ICT-enabled learning.
3. Community partnership and cultural integration were emphasised as core pillars of the framework.
4. The design proposed systematic strategies to improve inclusion, attendance, and continuity in learning.
5. The framework aligned with SDG 4 principles while being contextually adapted to the specific needs of Attappadi.

Findings for Objective 3: Validation of the LSDGs Framework

1. Expert review produced a high Content Validity Index (CVI = 0.91), demonstrating strong construct validity.
2. Experts endorsed the clarity, relevance, cultural appropriateness, and operational feasibility of the framework.
3. Pilot testing indicated that teachers could implement the framework effectively, requiring minimal additional support.

4. Feedback from stakeholders—including teachers, parents, and school administrators—affirmed the framework’s practicality and value.
5. Minor linguistic and structural revisions enhanced clarity and usability of the final framework.

Findings for Objectives 4–6: Teachers’ Relationship with Children

Before LSDGs

- Teacher–child relationships were emotionally strong but lacked structured academic scaffolding.
- Supportive interactions existed but were informal without systematic mentoring or documentation.

After LSDGs

- Relationships became more structured and academically supportive through mentoring circles and continuous follow-up.
- ICT tools, experiential learning, and culturally responsive pedagogy strengthened relational quality and learner confidence.

Comparison

- There was a clear transition from informal, empathy-based interactions to structured, culturally grounded, and learner-centred relationships.

Findings for Objectives 7–9: Learning Quality of Children

Before LSDGs

- Learning was dominated by rote memorisation, weak assessment mechanisms, and poor foundational literacy.

After LSDGs

- Learning quality improved through ICT integration, continuous assessment, bilingual strategies, and experiential learning.

Comparison

- Overall learning ecosystems transformed from passive, teacher-driven environments to active, inclusive, and engaging learning settings.

Findings for Objectives 10–12: Academic Achievement

Lower Primary

- Foundational literacy and numeracy improved steadily from pre- to post-LSDGs phases due to targeted FLN interventions.

Upper Primary

- Students demonstrated improved comprehension, writing skills, and problem-solving abilities following LSDGs implementation.

High School

- Students exhibited stronger academic performance through mentoring, digital learning tools, and experiential learning opportunities.

Across all school levels, academic achievement followed an upward trajectory.

Findings for Objectives 13–15: Life Skills Development

Lower Primary

- Significant improvement was observed in communication, sharing, emotional expression, and self-care.

Upper Primary

- Students developed leadership, teamwork, collaboration, and digital literacy skills.

High School

- Students demonstrated improved resilience, decision-making, emotional regulation, and interpersonal competence.

Life skills strengthened consistently across phases due to structured activities and ICT-supported learning.

Findings for Objective 16: Overall Status After LSDGs

1. Quality of education improved across all dimensions—pedagogy, assessment, inclusion, infrastructure, and life skills.
2. Continuous assessment mechanisms facilitated early identification and remediation of learning gaps.
3. School environments became more child-friendly, culturally relevant, and resource-rich.
4. Parental engagement increased significantly, strengthening home–school collaboration.
5. Learning experiences became more joyful, meaningful, and aligned with SDG 4 competencies.

Tenability of Hypotheses

Based on the analyses conducted for achievement and life skills across lower primary, upper primary, and high school students from tribal communities in

Attappadi, the tenability of all hypotheses was examined. The results clearly indicate consistent, statistically significant improvement across the pre-LSDGs, during-LSDGs, and post-LSDGs phases. Accordingly, the tenability of each hypothesis is presented below.

Hypothesis 1

There exists no significant difference in the mean score of achievement of lower primary students from tribal communities in Attappadi before, during, and after the implementation of LSDGs.

The repeated measures ANOVA with Greenhouse–Geisser correction showed a significant within-subjects effect of Year on LP students' academic achievement, $F(1.44, 594.38) = 25.60, p < .001$, with a small to moderate effect size ($\eta^2p = .058$). This indicates that students' grades changed significantly across the three phases of LSDGs implementation. Between-subjects results suggested stable overall performance differences among students, confirming that the observed changes reflected true longitudinal improvement rather than individual variability. Bonferroni-adjusted post hoc tests showed that grades increased significantly from 2022 to 2023 and from 2022 to 2024, with a smaller but still significant gain from 2023 to 2024. Overall, the results demonstrated a consistent, progressive improvement in academic achievement over the three years.

Hypothesis 2

There exists no significant difference in the mean score of achievement of upper primary students from tribal communities in Attappadi before, during, and after the implementation of LSDGs.

The repeated measures ANOVA with Greenhouse–Geisser correction showed a significant within-subjects effect of Year on UP students' academic achievement, $F(1.44, 594.38) = 25.60$, $p < .001$, with a small to moderate effect size ($\eta^2p = .058$). Between-subjects results indicated stable overall performance differences among students, confirming that the improvements reflected true longitudinal change. Bonferroni-adjusted comparisons showed significant increases from 2022 to 2023 and from 2022 to 2024, as well as a smaller but significant gain from 2023 to 2024. Overall, the findings demonstrate a consistent upward trend in UP students' academic achievement across the three years of LSDGs implementation.

Hypothesis 3

There exists no significant difference in the mean score of achievement of high school students from tribal communities in Attappadi before, during, and after the implementation of LSDGs.

The repeated measures ANOVA with Greenhouse–Geisser correction showed a significant within-subjects effect of Year on high school students' academic achievement, $F(1.15, 364.88) = 339.00$, $p < .001$, with a large effect size ($\eta^2p = .517$), indicating substantial improvement over time. Between-subjects results showed no notable differences among students, confirming that the gains reflected true longitudinal change. Bonferroni-adjusted comparisons revealed significant increases from 2022 to 2023, from 2023 to 2024, and the largest improvement from 2022 to 2024. Overall, the results demonstrate a strong and steady upward trend in achievement across the three years of LSDGs implementation.

Hypothesis 4

There exists no significant difference in the mean score of life skills of lower primary students before, during, and after the implementation of LSDGs.

The repeated measures ANOVA with Greenhouse–Geisser corrections showed significant year effects across all life skill domains among Lower Primary students. Problem-Solving Ability increased substantially over time, $F(1.44, 611.05) = 1044.00, p < .001, \eta^2p = .711$, while Critical Thinking Skills demonstrated an even larger improvement, $F(1.01, 429.04) = 1849.00, p < .001, \eta^2p = .813$. Creative Thinking Skills also rose significantly, $F(1.43, 607.66) = 865.00, p < .001, \eta^2p = .671$. Total Life Skill scores showed the strongest effect, $F(1.31, 558.36) = 1938.00, p < .001, \eta^2p = .820$. Post hoc comparisons confirmed significant improvements between all year pairs (all $p < .001$), with the largest gains occurring from 2022 to 2024. The findings indicate a consistent and substantial enhancement in creative, critical, and problem-solving skills across the before, during, and after phases of LSDGs implementation.

Hypothesis 5

There exists no significant difference in the mean score of life skills of upper primary students before, during, and after the implementation of LSDGs.

- The descriptive results showed steady gains in total life skills and in Creative Thinking, Critical Thinking, and Problem-Solving from 2022 to 2024. The repeated measures ANOVA confirmed significant year effects for overall life skills, $F = 677.00, p < .001 (\eta^2p = .622)$, Critical Thinking, $F = 781.00, p < .001$

($\eta^2p = .655$), Creative Thinking, $F = 547.00$, $p < .001$ ($\eta^2p = .570$), and total life skill scores, $F = 1465.00$, $p < .001$ ($\eta^2p = .781$). Post hoc tests showed significant improvements between all years, with the largest increases from 2022 to 2024. Hence, Upper Primary students demonstrated consistent and substantial life skill development across the LSDGs implementation period.

Hypothesis 6

There exists no significant difference in the mean score of life skills of high school students before, during, and after the implementation of LSDGs.

This hypothesis is rejected. HS students showed substantial gains in higher-order life skills—such as critical thinking, problem solving, resilience, and creative thinking—during and after LSDGs implementation. The significant statistical improvement validates the alternative hypothesis and confirms the tenability of the proposed effect.

- High school students showed steady improvement in all life skill domains from 2022 to 2024. Repeated measures ANOVAs confirmed significant year effects for Problem-Solving ($\eta^2p = .703$), Critical Thinking ($\eta^2p = .675$), Creative Thinking ($\eta^2p = .693$), and total life skills ($\eta^2p = .843$). Post hoc tests showed significant gains across every year pair, with the largest increases from 2022 to 2024. Hence, the life skills improved consistently across the LSDGs implementation period.

Limitation of the Study

- The access to data before 2015 was limited
- A continuous observation of the life skills of the same students was not practicable.

- The study focuses exclusively on tribal schools in Attappadi and includes teachers and students within the identified LSDGs intervention period. The findings are limited to the selected sample and qualitative data sources used in the research.
- Critical methodological limitations:
 - a. Lack of control/comparison group
 - b. Single-group pretest–post-test is weak for attributing causality
 - c. Threats:
 - d. Maturation (natural improvement over years)
 - e. History effects (other govt programmes)
 - f. Testing effects
 - g. Teacher changes, curriculum changes

Delimitation of the study

- Quality education under SDG 4.1.1 was examined through four dimensions: foundational learning, chronic absenteeism, academic achievement, and life skills.
- The module focused exclusively on three life-skill components: problem solving, critical thinking, and creative thinking.
- Academic achievement was measured using researcher-developed tests aligned with curriculum-based learning outcomes.
- The study was limited to students from tribal community in selected government and government-aided schools in Attappadi, Kerala.

- The intervention used a localized SDG module tailored specifically to the socio-cultural context of Attappadi.
- Data were collected only for the academic years 2022, 2023, and 2024.

Conclusion

This study set out to explore the research problem through a mixed-method approach that integrated both quantitative and qualitative data to provide a comprehensive understanding of the phenomenon under investigation. The synthesis of findings revealed that while the quantitative data provided measurable evidence of trends and relationships, the qualitative insights enriched these results with contextual depth and personal perspectives. Together, these complementary strands illuminated how the studied variables interact to shape educational experiences and outcomes, thereby enhancing the overall validity and robustness of the conclusions drawn.

The results underscore several key contributions to educational theory and practice. Theoretically, the study advances understanding by bridging existing gaps between empirical data and contextual realities in educational settings. It extends current frameworks on learning and instructional effectiveness by highlighting the dynamic interplay between learner characteristics, teaching practices, and institutional support systems. Practically, the research provides actionable insights that can inform pedagogical strategies, curriculum design, and policy formulation. Educators may benefit from adopting evidence-based approaches identified in this study, while policymakers can use these findings to refine programs that promote equity, engagement, and academic achievement.

Beyond these contributions, the study has important implications for educational reform and professional practice. The integration of mixed methods allowed for a more holistic view of educational processes, demonstrating the value of methodological pluralism in addressing complex research questions. The findings suggest that effective educational interventions must be context-sensitive, data-informed, and adaptable to the diverse needs of learners.

However, no study is without limitations. While the results are robust within the specific context examined, they may not be universally generalizable. Future research should expand on this work by incorporating larger and more diverse samples, exploring longitudinal effects, and employing advanced analytical techniques to further validate the findings. Additionally, future studies could investigate how emerging technologies, inclusive pedagogies, and evolving educational policies interact with the factors identified here.

In conclusion, this study contributes meaningfully to the discourse on educational improvement through its integration of quantitative rigor and qualitative insight. It reinforces the value of evidence-based practice, offers a nuanced understanding of key educational dynamics, and sets the stage for continued inquiry aimed at fostering more equitable and effective learning environments. The outcomes of this research not only add to the body of scholarly knowledge but also provide practical directions for stakeholders committed to advancing education in theory, policy, and practice.

RECOMMENDATIONS AND SUGGESTIONS

-
- *Recommendations and Suggestions*
 - *Educational Implication of the study*
 - *Suggestion for Further Research*
-

This study examined the status of quality education among Students From Tribal Communities in Attappadi in relation to Sustainable Development Goal 4 (Quality Education), both before and after the implementation of the Localised Sustainable Development Goals (LSDGs) framework. The research adopted qualitative methods including thematic analysis of teacher narratives, stakeholder feedback, document analysis, and the use of validated tools for assessing teacher–child relationships, learning quality, academic achievement, and life skills development at lower primary, upper primary, and high school levels. The LSDGs framework was designed based on local socio-cultural realities, validated by experts, and piloted in selected schools.

The pre-LSDGs phase (2022) revealed significant gaps in infrastructure, assessment systems, pedagogy, inclusion, and parental engagement. The LSDGs framework was implemented from 2022 to 2024 through interventions such as bilingual teaching, continuous assessments, ICT-enabled learning, mentoring circles, experiential learning, parental involvement mechanisms, and teacher professional development programs.

Post-LSDGs results demonstrated improvement in teacher–child relationships, learning quality, academic achievement, and life-skill development across all levels of schooling. Comparative analyses indicated clear shifts from traditional, teacher-driven practices to more inclusive, culturally grounded, and technology-enabled learning environments. Overall, the study presents a comprehensive understanding of the transformative impact of the LSDGs framework on tribal education in Attappadi.

Recommendations for Schools and Teachers

1. Continue implementing structured mentoring circles to strengthen teacher–child relationships and personalised support.
2. Maintain bilingual and culturally responsive teaching practices to enhance comprehension and engagement among tribal learners.
3. Promote experiential learning through field visits, eco-clubs, local projects, and community-based activities.
4. Strengthen continuous and competency-based assessments supported by digital tracking systems.
5. Offer sustained professional development programs for teachers in phonics instruction, child psychology, differentiated learning, and inclusive pedagogy.

Recommendations for School Administrators

1. Ensure the consistent availability of ICT tools, library resources, and activity-based learning materials.
2. Institutionalise structured parental engagement through regular meetings, digital communication platforms, and home-learning partnerships.
3. Establish school-level monitoring and support committees aligned with LSDGs indicators.
4. Facilitate ongoing capacity-building workshops and peer-learning opportunities for teachers.

Recommendations for Government and Policy Makers

1. Allocate dedicated funding to sustain LSDGs-based educational interventions in tribal schools.
2. Explore the scalability of the LSDGs framework to other tribal regions with necessary contextual adaptations.
3. Strengthen collaboration between Panchayats, schools, and educational departments to support SDGs localisation.
4. Invest in digital infrastructure, teacher training, and monitoring systems for remote tribal areas.

Recommendations for Future Research

1. Conduct longitudinal studies to examine the long-term effects of the LSDGs framework on learning outcomes, life skills, and well-being.
2. Undertake comparative studies across tribal regions to identify best practices and scalable strategies.
3. Explore the role of tribal languages and mother-tongue-based multilingual education (MTB-MLE) in improving foundational learning.
4. Investigate gender-specific educational challenges within tribal communities.
5. Examine the integration of indigenous knowledge systems into curricular and co-curricular activities.

6. Study can be conducted to check the programmes implemented panchayat governing system
7. Role of Panchayats in education governance: Comparative studies on the effectiveness of decentralized governance in improving accountability, resource use, and learning outcomes.
8. Digital readiness and equity: In-depth analysis of the digital divide in remote and marginalized communities, and the effectiveness of ICT-based interventions

Educational Implications.

- Classroom Teaching and Learning: The LSDG framework demonstrates that culturally responsive, activity-based, and ICT-integrated pedagogy—combined with structured teacher–child relationships—is essential for significantly improving engagement, comprehension, and confidence among learners from tribal community.
- Assessment Practices: Continuous and competency-based assessments must replace informal methods, as structured evaluation systems are crucial for accurately identifying learning gaps and supporting meaningful academic progress in tribal contexts.
- School Leadership and Administration: School leaders must adopt SDG 4–aligned whole-school development plans that priorities resource enhancement, ICT access, and strengthened school–community engagement to ensure equitable learning environments.

- **Teacher Professional Development:** Sustained professional development in bilingual pedagogy, culturally relevant teaching, ICT integration, and life-skills facilitation is essential for enabling teachers to effectively implement the LSDG framework and support holistic learner growth.
- **Educational Policy and Decentralized Planning:** The success of the LSDG framework highlights the need for localised SDG-based indicator systems to guide educational planning, resource allocation, and intervention design at Panchayat and district levels, particularly in tribal regions.

Suggestion for further Research

Experimental or Quasi-Experimental Research Designs

Future research may employ experimental or quasi-experimental methods to establish stronger causal relationships between LSDG interventions and improvements in learning quality, teacher–child interactions, and achievement.

- **In-Depth Analysis of Life Skills**

More focused research is needed to analyse specific life skills—such as critical thinking, creative problem solving, and resilience—using specialised assessment tools and mixed-method approaches.

- **Exploration of Cross-Sectoral SDG Linkages in Tribal Education**

Further studies should investigate how interconnected SDGs—such as health, nutrition, poverty reduction, and digital access—shape educational outcomes, enabling more integrated planning for tribal development.