

**INTERACTION EFFECT OF LEARNING STYLE APPROACHES
TO STUDYING AND CLASSROOM CLIMATE
ON ACHIEVEMENT IN SOCIAL SCIENCES
OF SECONDARY SCHOOL PUPILS**

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DECLARATION

I, K.K. Shanmugha Das, do hereby declare that this report *Interaction Effect of Learning Style Approaches to Studying and Classroom Climate on Achievement in Social Sciences of Secondary School Pupils* has not been submitted by me for the award of a Degree, Diploma or Recognition before.

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I, Dr. P.K. Sudheesh Kumar, do hereby certify that this report *Interaction Effect of Learning Style Approaches to Studying and Classroom Climate on Achievement in Social Sciences of Secondary School Pupils* submitted for the degree of Doctor of Philosophy in Education of the University of Calicut, is a record of bonafide study and research carried out by Shri. K.K. Shanmugha Das, under my supervision and guidance.

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Chapter 1

INTRODUCTION

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- ❖ *Need and Significance*
 - ❖ *Statement of the Problem*
 - ❖ *Definition of Key Terms*
 - ❖ *Variables Selected for the Study*
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CHAPTER 1

As the world has moved from the industrial age to a technology based society in which individual and societal competence is paramount, the focus of educational systems must shift from the basic ABC's to Competency-Based Education. Educational priorities may be continually revised to meet competitive and ever-changing work place demands and hence student performance must be assessed on specific, employer-determined competencies (Ames, 1996). To ensure the impact of that specific competencies imparted to all students, teachers should improve understanding of the learning process and theories of instructional effectiveness.

Children should be provided with a common education that enhances the individuality and encourages personality and simultaneously passes along the society's culture and its tools (Joyce *et al.*, 1992). In a developing society like India, ensuring quality education for all is a matter of prime concern. The educational system, especially the secondary school sector has expanded considerably in the post independent India. But this sudden expansion has resulted in increased *qualitative differentiation* in schooling. The quantitative expansion of educational system needs to be simultaneously incorporated with improved inputs, instructional and learning techniques to improve the quality of learning outcomes.

Learning is portrayed as an active process of making sense of the world around by engaging with the subject matter in ways which develop both interest and a deeper level of understanding (Marton, 1988). Teachers can foster this process by recognising how students *conceptualise* important aspects of subject, and by encouraging strategies which empower the students to learn for themselves. It involves an important transfer of power from teacher to student; yet it is precisely the transfer that is essential to leave young people with the attitudes, skills and competencies required to make the way in the world.

Teachers should surely not leave effective study strategies to evolve through trial and error as now in a position to provide coherent advice. Techniques of studying are better introduced within a framework which encourages students to reflect on how to interpret requirements accurately, how to develop personal understanding and how to monitor the *effectiveness* of their own learning.

In the present era of science and information technology, psychologists and educationists in India and abroad are actively trying to evolve measures *to raise* the quality of *learning outcomes* in the school classrooms. A number of factors that affect the process of learning rather than the product were sorted out by researchers. Systematic and scientific efforts are required to identify and understand the nature of student learning and scholastic achievement.

Today's classrooms are increasingly multi-cultural, and students bring rich personal, social, intellectual and educational experiences to classrooms that teachers must use. Optimising learning for all students in classrooms can

be achieved through multiple learning opportunities and *style-shifts* for all students as these differences are valued and celebrated (Suleiman, 1996). On the other hand teachers are encouraged to adjust their teaching strategies and the students unique learning styles. This is especially true in the present increasingly diverse classrooms where multiple ways of knowing, learning and interacting have to be valued.

In recent years there has been a substantial amount of research focussing on the relationship between *qualitative differences* in students' learning style and learning outcomes. Most of these studies have, however, focussed on the *qualitative differences* in learning outcomes of students engaged in individual academic tasks such as reading an academic article (Dahlgren, 1984).

While spotlighting on students' experience of academic learning it is important to avoid a narrow emphasis on the effectiveness of teaching (Entwistle, 1990). A broader view which encompasses the whole learning environment is more likely to lead to improvements in learning outcomes. Research evidences show that in order to carry out learning tasks successfully, efforts should be made to *match instruction* to important study characteristics of the learner (Suleiman, 1996 & Warren, 1999).

Researches provide a language of concepts and categories through which to discuss more precisely teaching and learning in higher education. Through that language teachers should be able to explain to students how to become more effective learners. Researches suggested that it is essential for students to become more *aware* of the learning styles and strategies to

think out carefully what is expected to achieve from studying and to understand the implications of adopting a particular learning strategy.

The stages of cognitive development of several students may not correspond to their ages and achievements (Piaget, 1973). This accounts for contradictions in levels of achievement across the curriculum. Most teachers are unprepared to shift attention from explicit *presentations of subject matter* to fostering development of abstract thinking and are reluctant to reduce or substitute content despite the implications of Piagetian research (Giles, 1995). Knowing *how students learn* can then help to inform good choices by teacher of content, resources and teaching strategies.

Teachers can make *improvements* in instruction when teach in ways that bring about not only learning in that particular subject, but also pupils' personality development. Teachers are thus to identify students' *learning styles* and *strategies* and take them into consideration when designing instruction (Moustafa, 1999). Teachers also need to provide opportunities for students to learn in a way which suits the preferred style of learning (Entwistle, 1981).

Students have very different reasons for continuing education which can be understood in terms of contrasting dominant motives (Taylor, 1983). The importance of this research is in the way it reinforces the idea that students have reasons for studying which powerfully influence the approaches and achievements.

Recent research evidences show that teaching is only one among many factors that influences learning. It becomes increasingly visible that student characteristics influence subsequent learning and its educational outcomes

(Clarke, 1986). Students with well organised study approaches and styles are expected to excel in academic performance, but researchers are sharply focussed on how *to improve* the overall quality of student learning in classrooms.

Research evidences also reveal that successful learning is not possible *without* conducive *environment*. It is a strong sociological factor that can deeply influence academic achievement (Fraser, 1986). The central assumption in Piaget's (1973) analysis of cognitive change was the belief that development depends upon a continuous *interaction* between organism and environment.

Learning is a covert intellectual process providing the development and restructuring of existing conceptual schemes. Classroom learning takes place within a complex social environment. It is necessary to understand how the class climate affects pupils' learning. Every learning environment produces a range of responses by students, expressed in terms of the efficiency and comfort with which the learners are able to interact with the environment (Bound, *et al.*, 1985). Loosly speaking learning style and environment designed to produce learning interact differently. No given learning environment will produce exactly the same effects on *all* students.

The learning process is thus an *organised whole* of all those characteristics with regard to the *teacher, student, classroom environment* etc. Review of literature on psycho-educational researches are convincingly enough to highlight the recent advancements in the research on psychology of learning. Currently, educationists are interested in the *nature* and *degree of relationship* of many *student variables* (Cognitive and Non-cognitive),

teacher variables (Teacher Effectiveness, Teaching Styles), *contextual variables* (Classroom Climate, Effect of Academic Department) and *student specific variables* (Approaches to Studying, Styles of Learning, Learning Strategies, Study Habits) related to student performance in the classroom.

1.1. NEED AND SIGNIFICANCE

Even though there is no dearth of variables to account for learning outcomes, the present study is designed to highlight on *student specific* variables like Learning Style and Approaches to Studying besides the climate factors that affect learning process. These variables have opened up avenues for the concepts of learner *participation* and *involvement* in learning tasks. There are research reports that revealed involvement had a significant effect on achievement (Pine, 1980; Vedras & Pankowski, 1980). Welden (1996) reported greater *learner satisfaction* obtained when students *involved* in learning tasks.

An important shift in perspective in the research on classroom learning is the acceptance that it is important to understand learning from *pupils' perspective*, which is different from those of both teachers and researchers (Entwistle, 1988). Hence a diversion emerged in research on *how students learn*.

Learning to a greater extent depends on a large number of *facilitating* and *debilitating* factors such as the pupil's aptitude and affect, socio-familial background, instructional methods, cognitive style, classroom climate and pupils' style of learning and approaches to studying. As a result, a number of eminent researchers have attempted to evolve factors of how students learn from student's *own perspectives*. Pask's work (1976) which absolutely dealt

with the ways students tackled a learning task ultimately paved the way for a student specific variable viz., the *Learning Style*. Learning Style is concerned with the adoption of similar set of strategies consistently across different learning tasks and settings. Following with Pask's (1976) tradition of research on styles and strategies Kolb (1983), Keefe and Monk (1986), Schmeck (1988), Taneja (1989), Price, *et al.* (1991), Dunn (1991) and Harvey (1994) have explored the various aspects of Learning Style. Learning Style has been subjected to topic of research since then, unveiled the relationship of Learning Style with different student-teacher-environmental characteristics. *Style Preferences and Instructional Groupings* (Dunn & Griggs, 1990), *Learning Style and Teaching Style Congruency* (Cooper & Miller, 1992), *Learning Style and Achievement and Retention* (Barbara, 1993), *Learning Style Preferences* (Dunn, 1995), *Learning Style and Achievement Motivation* (Preetha, 1996), *Learning Style and Approaches to Studying* (Rehna, 1996), *Learning Style and Achievement* (Santhoshkumar, 1997; Kumar, 1997), *Learning Style and Intelligence* (Prasanna, 1997), *Learning Style and Classroom Climate* (Bhargavi, 1999), *Learning Style with regard to Sex and Locale* (Gopalan, 1999), *Learning Style and Multiple Intelligence* (Dunn, *et al.*, 2001) etc. have been studied elaborately.

When pupils were required to demonstrate understanding, they showed differing strategies in the way the learning materials were tackled (Pask, 1976). *Learners are found to adopt a fixed style of learning that is unlikely to change or grow.* So it is important to focus on *how students learn*. Research reports indicate that academic achievement will be the highest if pupils are given a chance to proceed according to *their own style of learning*. This is well applicable in social sciences where observations, self

experimentation etc. are necessary. Individuals may not ultimately confirm knowledge until they handled it in modalities they strongly trust. In higher education field technology provides new capabilities to reconstruct learning environments around specific learning styles.

A group of English (Entwistle & Robinson, 1976) and Swedish (Marton & Saljo, 1976) researchers focussed on the *qualitative differences* in learning. Biggs (1979) and his collaborators in Australia, also studied the perspective of learning process. Among these researchers using different approaches and different analytical instruments, the three groups have developed a reasonably coherent account of the different approaches of students in learning tasks as well portrayed in Marton *et al.* (1984). Results of these researches led to the identification of the variable *Approaches to Studying*.

Teachers need to know much about helping learners develop environment relevant skills. It is interesting to observe students in schools that have *distinctive* approaches to learning and that pay attention to helping learners become effective in environments they are creating. Schools that emphasize self directed activity need to teach students how to engage in self direction (Joyce, *et al.*, 1992).

The emphasis on learning and examining the factual material pushes students into a mode of learning which few teachers would consciously accept as appropriate, but which many teachers currently repeatedly reinforce through their criteria for marking. These indirect messages strongly influence students' approaches to learning (Entwistle, 1987). It is also clear that the *students' own expectations* influence how they go about learning.

An indepth survey of literature on how students learn revealed that number of investigators have studied the variable *Approaches to Studying* and its related factors. Biggs (1979) – *Study Approach and Preference* (Ramsden & Laurillard, 1979) – *Variability in Approach* (Watkins, 1986; Speth & Brown, 1988) – *Deep and Surface Approach* (Entwistle & Waterston, 1988) – *Approach and Levels of Processing* (Watkins & Hattie, 1990) – *Study Approach and Self-esteem* (Trigwell & Prosser, 1991) – *Study Approach and Quality of Learning Outcomes* (Pillai & Naseema, 1991; Asmali, 1992; Kumar, 1993; Kumar, 1994; Prasad, 1995 & Rehna, 1996) have investigated the relationship of *Approaches to Studying with Scholastic Achievement*. Kumar (1997a, 1998) studied the *differences in Approaches to Studying* between High and Low achievers and *Study Approach and Cognitive Style*. In most of the studies conducted abroad and India a *positive influence* of Approaches to Studying on student characteristics was noticed.

Both *Learning Style* and *Approaches to Studying* seek to develop and increase understanding of the qualitative differences in the way students learn and to provide a sound *conceptual framework* for evaluating individual differences. But these represent *two different* perspectives on student learning influencing academic achievement (Harvey, 1994).

As enormous researches reported, effective learning warrants an appropriate environment. Earlier works on psychology of learning evolved positive association between *Classroom Climate* and *Student Achievement* (Fraser & O'Brien, 1985; Fraser, 1986; Ramsden, 1989; Payne, 1992; Pierce, 1994; Henderson, 1995 and Hudley, 1998). The effectiveness of classroom teaching will depend not only on the efficiency of the teacher and nature of

teaching material but also on *classroom environment* and other *special characteristics of learner* (Bound, et al., 1985). Classroom environment depends not only on the physical factors of the classroom, but on social, emotional, educational and economic factors also and how students and teachers perceive the classroom situation for bringing about maximum interpersonal relationships, thereby creating atmosphere for effective learning.

The response of the learner to new experience is determined significantly by past experience through which the learner perceives the world. The way one person reacts to a given situation will not be the same as others and this becomes more obvious when learners from diverse backgrounds work together.

Various aspects of Classroom Climate especially, Classroom Climate and Achievement was studied by different investigators both in and out of the country. *Classroom Climate and Performance* (Weir & May, 1990); *Classroom Climate and Task Behaviour* (Short & Short, 1991); *Classroom Climate and Motivation* (Payne, 1992); *Classroom Environment and Study Approaches* (Yuen-Yee, 1994); *Classroom Environment and Achievement* (Goh & Fraser, 1995; Panikker, 1996; Sunitha, 1997; Sasidharan, 1997 and Lee, et al., 1999) and *Learning Style and Classroom Climate* (Bhargavi, 1999) were reviewed and examined thoroughly.

Only a limited number of studies were reported to evolve the association of Learning Style and Approaches to Studying in *Indian context*. Review of literature in this area of research has pointed out the considerable amount of *conceptual overlaps* relating with Learning Style and Approaches

to Studying. A detailed survey of related literature regarding variables affecting Academic Achievement disclosed that *Learning Style, Approaches to Studying* and *Classroom Climate* play active roles in making learning process profound and perfect. But the investigator could not locate studies dealing with the *interaction effect* of Learning Style, Approaches to Studying and Classroom Climate on Student Achievement. That is why the investigator decided to take up a study of this kind to find out whether the variation in classroom achievement is due to the *single effect* of Learning Style, Approaches to Studying and Classroom Climate or the *combined effect* of the three variables. The present study is significant as such an effort has not been reported in the Indian context before. The investigator being a social science teacher the study is restricted in the Achievement in Social Sciences of secondary school pupils.

1.2. STATEMENT OF THE PROBLEM

The present study is entitled as INTERACTION EFFECT OF LEARNING STYLE, APPROACHES TO STUDYING AND CLASSROOM CLIMATE ON ACHIEVEMENT IN SOCIAL SCIENCES OF SECONDARY SCHOOL PUPILS.

1.3. DEFINITION OF KEY TERMS

The key terms used in the statement of the problem are defined in the following part.

1.3.1. Learning Style: Learning style in this study refers to the general tendency of pupils to adopt similar set of learning strategies consistently across different tasks and settings (Eysenck, 1994).

1.3.2. Approaches to Studying: As used in the present investigation Approaches to Studying refers to orientation of pupils in studying academic subjects to which different strategies of learning, styles of learning and associated forms of motivations are merged.

1.3.3. Classroom Climate: Classroom Climate is defined as the totality of external surroundings including conditions, circumstances and events in education often considered the extent to which such surrounding facilitate learning (Hawes & Hawes, 1982).

1.3.4. Achievement in Social Sciences: Achievement in Social Sciences as used in the present study is the accomplishment or proficiency of performance in social sciences (cognitive domain) as measured using a standardised test.

1.3.5. Secondary school pupils: Secondary School Pupils refer to pupils studying in standards VIII, IX & X in any school recognised by the Government of Kerala State.

1.4. VARIABLES SELECTED FOR THE STUDY

The following were the variables selected for the study.

1.4.1. Independent Variables

The Independent Variables selected for the study were

- 1.4.1.1. *Learning Style* (Four components viz., Environmental, Emotional, Sociological, Physical and Total score).
- 1.4.1.2. *Approaches to Studying* (Four components viz., Meaning Orientation, Reproducing Orientation, Achieving Orientation, Non-Academic Orientation and Total score) and
- 1.4.1.3. *Classroom Climate* (Total score only).

1.4.2. Dependent Variables

Dependent Variables selected for the study were *Achievement in Social Sciences* (Six Objective wise scores viz., Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation and Total score).

1.5. OBJECTIVES

Following are the objectives formulated for the study.

- 1.5.1 To study *whether there exists* any sex difference in Learning Style (Componentwise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.5.2 To study *whether there exists* any sex difference in Approaches to Studying (Componentwise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.5.3 To study *whether there exists* any sex difference in Classroom Climate (Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.5.4. To study *whether there exists* any sex difference in Achievement in Social Sciences (Objective wise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.5.5. To study the *main* and *interaction* effects of the three Independent variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Total sample.

- 1.5.6. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Boys.
- 1.5.7. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Girls.
- 1.5.8. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Rural sample.
- 1.5.9. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Urban sample.
- 1.5.10. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Government sample.
- 1.5.11. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Private sample.
- 1.5.12. To find out the *best predictor* of Achievement in Social Sciences from the set of three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate.

1.6. HYPOTHESES

The following hypotheses were framed and tested for the present study.

- 1.6.1. There will be *significant* sex difference in Learning Style (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.6.2. There will be *significant* sex difference in Approaches to Studying (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.6.3. There will be *significant* sex difference in Classroom Climate (Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.6.4. There will be *significant* sex difference in Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for the Total sample and Subsamples based on Locale and Type of management of school.
- 1.6.5. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for the Total sample.
- 1.6.6. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Boys.

- 1.6.7. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Girls.
- 1.6.8. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Rural sample.
- 1.6.9. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Urban sample.
- 1.6.10. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Government sample.
- 1.6.11. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Private sample.
- 1.6.12. Achievement in Social Sciences can be *predicted* using the set of three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate.

1.7. PROCEDURE

The procedure adopted for the study is briefed as follows:

1.7.1. Sample

The study was carried out on a representative sample of 917 secondary school pupils in Kerala state. The basal sample was obtained using

proportionate stratified sampling procedure with representation given to factors like Sex (Boy/Girl), Locale (Rural/Urban) and Management category of schools (Government/Private).

1.7.2. Tools Used for the Study

The data for the study were collected using the tools as described in the following.

1.7.2.1. *Learning Style Inventory - LSI* (Kumar, et al., 1996)

The style characteristics of the sample were measured using this Learning Style Inventory.

1.7.2.2. *Approaches to Studying Inventory - ASI* (Kumar & Das, 2001)

The study approaches adopted by the sample was quantified using the ASI. The inventory was developed and standardised by Kumar and Das (2001).

1.7.2.3. *Scale of Classroom Climate - SCC* (Usha & Sunitha, 1997)

This scale gave a measure of classroom climate as perceived by the sample.

1.7.2.4. *Achievement Test in Social Sciences - ATSS* (Kumar & Das, 2001)

The Dependent Variable Achievement in Social Sciences (Objective wise and Total score) was measured using the ATSS developed and standardised by Kumar and Das (2001).

1.7.3. Statistical Techniques Used for the Analysis of Data

Following statistical techniques were utilized for the processing of data in the present study.

1.7.3.1. Test of Significance of Difference Between Means

To study the sex difference in Independent Variables and Dependent Variables this statistical procedure was used.

1.7.3.2. ANOVA with 3 x 3 x 3 Factorial Design

To understand whether variation in Dependent Variables be attributable to variation in the levels of Independent Variables Three-way ANOVA with 3 x 3 x 3 factorial design was employed.

1.7.3.3. Scheffé Test of Post-hoc Comparison

ANOVA is followed by post hoc comparison of criterion means through Scheffé procedure. This was done to examine the levels of Independent Variables which have a significant main effect actually cause variation in the Dependent Variables.

1.7.3.4. Multiple Regression Analysis – Step wise

This statistical technique was used to predict the criterion (dependent) variable from the set of predictor (independent) variables.

1.8. SCOPE AND LIMITATIONS

The present study was intended to investigate the influence of *Learning Style, Approaches to Studying* and *Classroom Climate* on *Achievement in Social Sciences* of Secondary School Pupils. Appropriate standardised tools

were used for data collection. Data were analysed with utmost care and precision. Hence the investigator hopes that the study would yield reliable results, that can be generalised. The findings of the study may help educationists to reform teaching learning programme. Even then certain limitations which can hardly be avoided may creep into the study. They are the following.

- 1.8.1. The selection of Independent Variables that affect the Dependent Variables is confined to three major variables only viz., *Learning Style*, *Approaches to Studying* and *Classroom Climate*.
- 1.8.2. Selection of Dependent Variables has been restricted to *Social Sciences* only.
- 1.8.3. The study was conducted on one educational level i.e., standard IX, assuming it to be representative of *secondary school pupils*.
- 1.8.4. Objectives included in the Achievement Test in Social Sciences (ATSS) were those related only to Cognitive Domain of Bloom's Taxonomy.
- 1.8.5. Among various sociological variables (Classroom Climate, School Climate and Home Climate) only *Classroom Climate* was chosen for the study.
- 1.8.6. Selection of a few schools across the state intended for data were not representative of all institutions in the state.
- 1.8.7. The components of Learning Style and Approaches to Studying were not taken as Independent Variables in the Three-way ANOVA.

1.8.8. The components of Learning Style and Approaches to Studying were not considered as predictor variables for the Multiple Regression Analysis.

1.9. ORGANISATION OF THE REPORT

The presentation of this research report is as follows:

The five chapters of the report contain the significant aspects in different stages of the investigation are outlined against the chapter numbers.

Chapter I – An introduction to the problem, Need and significance of the study, Statement of the problem, Definition of key terms, Variables selected, Objectives and Hypotheses, A brief description of methodology, Scope and limitations of the study and Organisation of the report.

Chapter II – A theoretical overview of the independent variables along with review of related literature and meta analysis.

Chapter III – Methodology in detail, i.e., Variables selected for the study, Objectives and Hypotheses, Description of tools employed for the collection of data, Selection of sample for the study, Mode of data collection, Scoring and consolidation of data and Statistical techniques used for the analysis of data.

Chapter IV – Preliminary analysis and Major analysis of data collected and discussion of results.

Chapter V – A summary of the study – Study in retrospect, Objectives and Hypotheses, Procedure adopted for the study, Major findings of the study, Tenability of Hypotheses, Suggestions for improving educational practice and further research.

Chapter 2

REVIEW OF RELATED LITERATURE AND META ANALYSIS

❖ Theoretical Overview of the Variables

- ❖ *Learning Style*
- ❖ *Approaches to Studying*
- ❖ *Classroom Climate*

❖ Review of Related Studies

- ❖ *Studies Relating Learning Style with Achievement*
 - ❖ *Studies Relating Approaches to Studying with Achievement*
 - ❖ *Studies Relating Classroom Climate with Achievement*
 - ❖ *Meta Analysis*
-

CHAPTER 2

REVIEW OF RELATED LITERATURE AND META ANALYSIS

This chapter has been devoted for presenting the *theoretical overview, review* of related studies of the independent variables, viz., Learning Style, Approaches to Studying and Classroom Climate and a meta analysis of reviewed studies. This has been presented under the following headlines.

2.1. THEORETICAL OVERVIEW OF THE VARIABLES

2.1.1. LEARNING STYLE

2.1.2. APPROACHES TO STUDYING

2.1.3. CLASSROOM CLIMATE

2.2 REVIEW OF RELATED STUDIES

2.2.1. STUDIES RELATING LEARNING STYLE WITH ACHIEVEMENT

2.2.2. STUDIES RELATING APPROACHES TO STUDYING WITH ACHIEVEMENT

2.2.3. STUDIES RELATING CLASSROOM CLIMATE WITH ACHIEVEMENT

2.2.4. META ANALYSIS

2.1. THEORETICAL OVERVIEW OF THE VARIABLES

This section deals with the *meaning, origin, development* and the *present status* of the Independent Variables in the field of research.

2.1.1. LEARNING STYLE

Knowing *how* and *why* pupils learn in a specific manner unlocks the mysteries of good teaching (Giles, 1995). There has been substantial movement away from the rather rigid study method manuals of the 1950's and 1960's towards more experimental and more reflective activities which involve learner to monitor and evaluate learning capacities and styles (Main, 1985).

~A knowledge of one's own style of learning is important in *learning to learn*, (Pask, 1976). The recognition of this fact was a turning point in research in Psychology of learning to probe into the Learning Style of the learner - an essential student characteristic.

The learner doesnot learn unless know how to respond (Thelen, 1960). An individual may not ultimately confirm knowledge until handled it in modalities one strongly trusts. In higher education field, technology provides new capabilities to *reconstruct* learning environments around specific learning styles. Learning Styles are important because they are education-relevant expression of the uniqueness of the individual (Joyce, *et al.*, 1992).

The idea of Learning Style is based on the theory that an individual responds to educational experience with *consistent* behaviour and performance patterns (Irvin & York, 1995). The complexity of the construct, the psychometric problem related to its measurement and the relationship between culture and the teaching and learning process means that the body of research on Learning Style may be interpreted and applied carefully.

Sometimes the concept of Learning Style has been used in a sense parallel to the idea of Cognitive Style with the use of bipolar traits (Eysenck, 1994). However *Learning Style is related both to cognitive process and to personality.*

2.1.1.1. Learning Style and Cognitive Style

Learning Style and Cognitive Style were used by researchers parallelly as these were *bipolar* in nature. The relation of Learning Style to cognitive process often makes the term synonymous with Cognitive Style. But Learning Style is different from Cognitive Style.

Cognitive Style describes the ways in which people *process information* - including *perception, storage, transformation and utilisation of information* from environment (Whitehead, 1975). Kagan (1965), Witkin (1967) and Pask and Scott (1972) have explored the respective Cognitive Style dimensions viz., Impulsive/Reflective; Field Dependence/Field Independence; and Holist/ Serialist in different ways.

Learning Style involves *cognitive, physical* and *emotional* aspects of learning. Thus Learning Style is related both to *cognitive process* and to *personality*. The term has been used to cover a range of concepts which have emerged from attempts to describe aspects of student learning.

Cognitive Style is most commonly measured through *perceptual tests* such as the Embedded Figure Test (EFT) or the Matching Familiar Figures Test (MFFT) (Entwistle, 1981). In contrast, Learning Style has been identified either by *observing* students working on learning tasks or from *inventory scores*.

However the conceptual distinction between Learning Style and Cognitive Style still remain muddled and so a further refinement of the conceptual dimensions of the two is required.

2.1.1.2. Learning Style: Meaning and Definitions

Learning to learn has been the subject of much attention in the last decade in the secondary and post secondary education. A lot of recent work on learning skills has stressed the element of personal choice about Learning Style and methods (Main, 1985). The concept personal stances in learning gives paramount importance to the personal positions of learners. How learners place themselves within any learning context, whether formal or informal, is fundamental (Salmon, 1989). It defines students' own engagement with the material; it represents the very stuff of learning itself.

The term *Learning Style* has been used in the psycho-educational literature in two distinct ways (Eysenck, 1994). Firstly it has been used to indicate a broad description of relatively consistent behaviours related to ways of going about learning. It is treated as an individual difference of generality comparable to *Intelligence* or *personality*, but describing consistency in the ways people take learning tasks. Secondly the definition has been narrowed considerably to parallel the idea of *Cognitive Style*, with the bipolar traits, but described in relation to the learning tasks commonly found in educational contexts, as opposed to scores on psychological tests. However, Learning Style can be distinguished from Cognitive Style.

Learning Style appeared to change with *age* and *experience*. Although congruent, teaching and Learning Style usually improve Achievement, educational purpose plays an important role (Spoon & Schell, 1988).

Page, *et al.* (1977) defined Learning Style as *preferred mode of problem solving, thinking or learning used by an individual*. In the words of Entwistle (1981) *Learning style is defined as the general tendency to adopt a particular strategy*. According to Eysenck (1994) Learning Style is *a general tendency to adopt similar set of strategies consistently accross different tasks and settings*. Verma (1996) goes for the definition of Learning Style as *the individual characteristic ways of processing information, feeling and behaving in the learning situations*.

2.1.1.3. Learning Style: Varying Dimensions

There were number of attempts to describe the varying dimensions of Learning Style. Based on the concept of divergent thinking by Guilford (1967), Wallach and Kogan (1965); and Hudson (1966) drew attention to the existence of two distinct groups of children - *convergers and divergers*. Those with much higher scores on Intelligence than creativity were labelled *convergers*, while those with the reverse pattern of score were called *divergers*. Hudson (1966) reported that these two groups showed markedly different patterns of thinking, contrasting subject choice in school and even varying personality configurations. These arguments introduced the idea of individual differences to researchers in which cognitive differences were

paralleled with personality differences. This pattern later became the hallmark of Learning Style.

Pask (1976) found that even when students were required to demonstrate understanding, they still showed differing strategies in the way they tackled the learning materials. Based on his *Gandlemuller Taxonomy* he concluded that there are *two broad categories* of Learning Style. Some students adopt a *holist* style, while others prefer a *serialist* style.

The *holists* try to see the task in the widest possible perspective. The learning process involves the use of illustrations, examples, analogies and anecdotes in building up an idiosyncratic form of understanding deeply rooted in personal experience and beliefs. The *serialists* begin with a narrow focus, concentrate on details and logical connections in a cautious manner and look at the broader context only toward the end of the topic, if at all.

From this description, it is clear that the *holist style* is more suitable for *learning in the humanities* and *serialist style* in *the sciences*. But for many tasks, particularly in the sciences, elements of both styles are required. Pask found some students who were *versatile* and equally comfortable with *either holist or serialist style* and used each as *appropriate*.

Kolb (1983) distinguished four Learning Styles. They are *Convergers*, *Divergers*, *Assimilators* and *Accommodators*. Here convergers prefer *abstract material* and process it actively, while the divergers look for

concrete information and process it reflectively. The third and fourth style are *assimilators* (abstractions processed reflectively) and *accommodators* (active, concrete). There are parallels here with Jung's *psychological types* (Jung, 1933) and with the distinctive thinking processes attributed to *extroverts and introverts*.

A more recent set of distinctions can be found in the work of Biggs (1987) and used ideas derived from information-processing theories to investigate the ways in which students learn and study. The three categories described by Biggs (1987) characteristically different strategies for dealing with information, but these are related to the *intentions* and underlying *motives* of the learner. The styles here are actually referred to as *Approaches to Learning*. They are *Deep Approach*, *Surface Approach* and *Achieving Approach*. A Deep Approach is an attempt to understand the meaning of *what is being learned with an intrinsic motivation*, while a surface approach is based on an *extrinsic motivation and is driven by fear of failure*. The learner reproduces the information through rote learning. An Achieving Approach is related to the *competitive form of motivation and the strategy depends on well-organised study methods*.

Parallel to the work of Biggs (1987), Entwistle and Ramsden (1983) have included scales of Pask's Learning Styles in their inventory and were able to show the connections between Approach and Style. The *Deep Approach* is associated with a *Holist style* and the *Surface Approach* is linked with a *Serialist Style*. There is an additional 'non-academic' factor with low levels of motivation, negative attitudes and with extreme Learning Styles linked to 'Learning Pathologies'.

Entwistle and Ramsden (1983) were also able to relate the two main Approach/Style factor to measures of Cognitive Style and personality to show that *Deep Holists* were likely to be impulsive *thinking introverts* with a theoretical outlook, aesthetic interest and complex conceptualisation, who did well on tests of *divergent thinking*. The *surface serialists* had low scores of several of these dimensions, linked to a *strong practical* outlook.

However, Styles and Approaches were well distinguished by Harvey (1994) as two different conceptualisation of how students learn and study. As factor analysis showed that the Style and Approach variables load on separate factors, it seems appropriate to differentiate between the way students learn in terms of either style based or Approach based constructs.

2.1.1.4. Integrative model of Learning Style

Schmeck (1988) provides a tentative integrative model of Learning Style which includes three distinctive Learning Styles, described as *Deep*, *Elaborative* and *Shallow*. A stable introvert is seen adopted a Deep style which develops effective schema and conceptions, through articulated or field-independent thinking processes. A stable extrovert is more likely to use an Elaborative Style which involves an impulsive personalising of knowledge through global or field-dependent thinking substantial use of examples. Finally, the anxious individual is likely to be categorised as having a shallow style which depends on memorising, or repetitive rehearsal of information leading to the literal reproduction of what was studied.

There remains considerable debate about the nature and even the existence of Learning Style. However, there is substantial evidence that people do show strong and relatively consistent preferences for tackling learning tasks in distinctive ways. If that is what is taken to be Learning Style it seems important to take account of them in both research and educational practice (Eysenck, 1994).

2.1.1.5. Learning Style: A Multidimensional Approach

Multidimensional approach is a comprehensive view of Learning Style encompassing a range of variables including many of *non-cognitive nature*. It is a *recent* perspective on how students learn and is based on the theoretical assumptions about the relationship between *student characteristics* and *instructional setting* (Harvey, 1994).

Unlike the traditional bipolar approach of Learning Style it includes 20 style elements which are grouped under five dimensions or style areas. They are - *Environmental* (learner preferences to sound, light, temperature, seating design), *Emotional* (learner's motivation, persistence, responsibility, need for externally imposed versus structure), *Sociological* (self or peer oriented, authority oriented, learning in several ways as preferred by learners), *Physical* (perceptual modalities [auditory, visual, tactile, kinesthetic], time of day energy levels, need for intake and mobility of the learner) and *Psychological characteristics* (global/analytic processing styles, hemisphericity, impulsivity/reflectivity) of the learner.

The theory underlying the approach is that *students possess biologically based physical and environmental learning preferences which*

along with well established traits like emotional and sociological preferences combine to form an individual learning style profile (Price, et al., 1991).

Another approach is the National Association of Secondary School Principals (NASSP) Learning Style Model (Keefe & Monk, 1986). These are concerned with the *instructional preferences* or *individual choices* of the environment in which to learn. A student's learning style is thus claimed to be largely resistant to change (Dunn, 1991).

2.1.1.6. Match and Mismatch of Learning Style

Each learner has a fixed style of learning that is *unlikely to change* or *grow*. If unyielding teaching methods are mismatched with rigid learners a destructive collision is inevitable (Joyce, et al., 1992). Fortunately, teaching methods have great flexibility and students have great learning capacities and hence adaptability.

While several studies focus on how students learn, very few focus *on how teachers teach*. It has been assumed that successful learning is judged by effective teaching. To carry out learning tasks successfully, it is important for students to have multiple learning opportunities and *style shift* while learning (Suleiman, 1996). On the other hand, teachers should achieve a balance between *teaching strategies* and the student's unique *learning style*.

Pask investigated the effects of matching and mismatching learning materials with student's learning strategies (Pask, 1976). He suggested that teachers need to provide opportunities for students to learn in a way which

suits their preferred style of learning. If teachers adopt too extreme a method of teaching, perhaps reflecting their own learning style, one group of students will find the approach alien to their ways of learning.

Hunt, *et al.* (1981) exposed students of varying conceptual levels to teaching strategies which were matched and mismatched to their levels of development. There were considerable individual differences in their responses. Moreover the students *pulled* the behaviour of the teachers toward their *preferred styles* and the teachers responded by adapting the strategies to *conform* to the personalities of the students.

Students matched with learning materials of their own style *learn faster* and more fully than students who were mismatched (Entwistle, 1990). Thus teachers are encouraged *to adjust the teaching strategies* in light of the different *Learning Styles of the students* (Suleiman, 1996).

Recent researches also suggested that students whose instruction is not responsive to their Learning Style *achieve significantly less than children whose instruction is responsive* (Dunn & Griggs, 1995, Allred & Holliday, 1995, Matthews, 1995, & Warren, 1999). Clooney (1998) attributed *underachievement of students to a mismatch of student learning styles and teaching strategies* and recommended an increased variety of *teaching methods* to face the situation.

Teachers not only employ a model to teach but also teach the students to use the strategies of each model to educate themselves (Joyce, *et al.*, 1992). Instruction designed to *accommodate a student's style* is preferable to instruction which attempts *to change students' preferences*

(Harvey, 1994). Achieving successful learning outcomes is largely a matter of learners and teachers capitalising on the learning preference of the individual learner.

2.1.1.7. Learning Style Preferences

Even when students were required to learn in ways which would lead to understanding still showed distinct preferences in the styles of learning adopted. There are systematic differences in preferred Learning Style in contrasting academic disciplines (Entwistle, 1990). Science students are more *serialistic* and arts students more *holistic*, but to what extent students of that learning style are attracted to the subject is not clear. Students should be guided to become more effective learners. They should be *aware of their own learning styles and strategies* to think out carefully what they are trying to achieve and to understand the implications of adopting a specific style of learning. Learning techniques can be adaptive, potentially at least, if designed with flexibility in mind. Properly constructed, a learning environment fits soft rather than hard metaphors. It curls around the students, conforming to their *characteristics* (Joyce, *et al.*, 1992).

Learners may be provided *opportunities to learn in* a way which suits their preferred style of learning. Moustafa (1999) recommended teachers to *identify the students' Learning Styles* and take them into consideration when *designing instruction* and administer to provide *training about Learning Style* and multisensory approaches.

Instructors should consider testing their students to *determine students' Learning Style* so that they may suggest study methods and

approaches that may *increase academic achievement* (Carthey, 1993). Many more researchers have underlined the need for knowing how students learn and then help inform good choices by teachers (Giles, 1995; Matthews, 1996; Biller, 1996; Miller, 1998 & Warren, 1999).

Parents can also help children develop the life long learning skills and can work directly with young adolescents in the areas of Learning Style, independent learning skills, study skills and learning strategies (Cotton, 1998). The need for co-operation between teachers and parents in efforts to match home environment with children's strong Learning Style was also highlighted by Hong and Lee (1999).

Studies were also conducted on Learning Style preferences of children with *multicultural background* (Dunn, 1997). Research does not support the supposition that members of a particular ethnic group have the *same Learning Style* (Irvin & York, 1995). These researchers reminded teachers of culturally diverse students to be *alert to individual students' Learning Style* as well as their own action and methods in references to their students' cultural experiences and *preferred learning environments*. Silverman and Casazza (2000) also examined the Learning Style preferences of children and explained how diverse developmental needs such as *lack of self-esteem* or *cultural alienation* can be at the root of a student's *learning difficulties*.

In conclusion, educators must *actively involve students* in the learning process and provide a *relaxed, productive environment for learning, be innovative in approach* by allowing for varieties of Learning Style and demonstrate that the purpose of teaching is to *promote learning*.

2.1.1.8. Measurement of Learning Style

Measurement of Learning Style involves identification of Learning Style preferences using self reporting Inventory scores. Some important Learning Style inventories are discussed in the following part.

Kolb and Fry (1975) developed a *Learning Style Inventory (LSI)* that helps learners to discover the characteristics in the Learning Process via contrasting elements of two major dimensions - Concrete/Abstract; Active/Reflective.

The *Learning Style Inventory (LSI)* of Pask (1976) comprised of the strategies - Holists/Comprehension learning; Serialist/Operation learning; Versatile; and the Pathologies of learning - Globetrotting and Improvidence.

Kolb (1983) revised the previous *LSI* and distinguished four Learning Styles - Convergers, Divergers, Assimilators and Accommodators. Kolb linked the Learning Style to a model of learning process named 'Experiential Learning' model.

Torrance's Inventory (Torrance & Rockenstein, 1988) identified people in terms of whether they rely on right or left brain functions or integrate those functions by both hemispheres equally.

Price, *et al.* (1991) developed *Productivity Environmental Preference Survey (PEPS)* based on Dunn and Dunn model of Learning Style (Dunn, *et al.*, 1979) covers five style areas viz., Environmental, Emotional, Sociological, Physical and Psychological with their associated style elements.

Kumar, *et al.* (1996) constructed a *Learning Style Inventory (LSI)* based on the theoretical construct of Dunn and Dunn model. It includes four major style areas viz., Environmental, Emotional, Sociological and Physical with their associated style elements. This inventory excluded the psychological area of Dunn and Dunn model on the assumption that these processing styles are not tapped directly through items in the inventory.

2.1.2. APPROACHES TO STUDYING

Children may vary not only in their capabilities for learning but also *in the ways in which they approach and deal with a given task*. In recent years there has been a substantial amount of research focussing the relationship between *qualitative differences* in students' approaches to studying and learning outcomes of that study.

In the last two decades new insights into learning in natural educational settings have been gained. Researchers started to describe learning processes from the *perspective of pupils* in schools. Fundamental *qualitative differences* in how *students approach learning* in realistic educational contexts have been revealed (Ramsden, *et al.*, 1989).

Research evidences have indicated the emergence of an approach to the study of human learning which focusses on relating the *students' motivations and conceptions of their own learning to the learning strategy* adopted (Watkins, *et al.*, 1986). One of the strengths of this approach has been the relative convergence of findings from distinctive research traditions.

2.1.2.1. Approaches to studying: A Perspective

Early works concentrated on the process of learning in such a way to ignore *the personal view point of the learner* regarding the learning process. Those studies *neglected* how the learner goes about learning. One important shift in perspective in the research on classroom learning is the acceptance that it is important to understand learning from the *learner's perspective*, which is different from those of both teachers and researchers (Entwistle, 1981). With this realisation, there has been a rapid growth in research on learning process and recognised the assumption that any general ideas about learning have to be reappraised in relation to specific types of learning or tasks *within the classroom* and from the *student's point of view* (Entwistle, 1987).

Efforts were made in this line to discover how students experience learning in classroom. An immediate problem here is that it requires the student to be capable of *describing the salient experiences*. With young children such introspection is rare and therefore, much of the initial work on how *students learn from learners' perspective* has been carried out in higher education.

General questions about how students learn or conceive of learning produce vague answers which are difficult to interpret. It is essential to help the student to focus down *from the abstract and general to the concrete and particular*. Heath (1978) noticed marked *personality differences* among the students' method of learning.

Peel (1972) and his colleagues studied students' reports in terms of *quality of thinking*. The main distinction was in between students' explanations and descriptions about how students experience the process of learning. This led to the important conclusion that there is always *qualitative differences* in students expression of *individual understanding*.

This approach gained relative convergence of findings from distinct research traditions - the *qualitative* as exemplified by *Marton and Saljo (1976)* in Sweden and the *quantitative* as exemplified by *Entwistle (1981)* in United Kingdom.

2.1.2.2. Approaches to studying : Meaning and Definition

In simple terms an Approach to Studying is the way in which a person *approaches* a learning material. It is based on a *motive* or *intention* which provides the general direction to learning and a *strategy* or *set of strategies* that will pursue that general direction (Biggs, 1987a). Whatever the interest in a particular task, students tend to have fairly stable motives towards school work, just as students have stable conceptions about what school learning might be. Accordingly learners tend to go about learning in a consistent way. This *consistency of motive and strategy* is what is meant by a students' *approach to learning* (Biggs, 1990) or *studying*.

According to Entwistle (1987) Approaches to studying are a product of the interaction between the *characteristics of individual students* and *perception of courses, teaching and assessment* procedures.

A Deep Approach is based on *Intrinsic motivation* and the students seek an understanding of the material presented. It is based on the interest

in the subject matter (Biggs, 1990). In contrast a Surface Approach is based on *extrinsic motivation* and students tend to memorise information and focus on the requirements of tests and examinations (Saljo, 1981; Gibbs, *et al.*, 1982). Further researches proved the existence of a third approach viz., *Achieving* or *Strategic*.

However, these approaches are *not constant* in any one student and someone might adopt a Deep/Surface Approach depending on the circumstances and their intentions at the time.

2.1.2.3. Approaches to Studying: A Theoretical Focus

The last decade was a period of thinking about student learning. There was a shift in perspective to consider learning as experienced by the student, not as seen by the teacher or researcher. Similarly there was a clearer articulation of a range of student motivations to learn and student strategies for learning (Clarke, 1986).

The synthesis of these two elements has arisen from a series of studies principally by *three groups*. In Gothenburg, Sweden (*Marton & Saljo*, 1976; *Fransson*, 1977; *Svensson*, 1977); In United Kingdom (*Entwistle & Robinson*, 1976; *Entwistle, et al.*, 1979) and in New Castle, Australia (*Biggs*, 1979). The result was the emergence of a single concept derived from different groupings termed as Deep/Surface Approach. Roots of the concept can be traced back to the thoughts of Watts (1810) and Dewey (1910).

Approaches to Studying are influenced by *a variety of factors* like intention, content and context, perception of the task and its setting, motives and academic self concept.

Marton and Saljo (1984) described the qualitative differences in learning outcome in terms of *Surface* and *Deep Approaches*. Biggs (1979) in an empirical work studied *students approaches* to their academic study. This research findings also showed that *individual differences in learning* approaches can be reduced to two approaches namely, *Deep* and *Surface* (Biggs, 1979, Entwistle, *et al.*, 1979).

A sharp demarcation in the concepts of Deep/Surface Approach was given by Entwistle (1981). Besides these a third approach also comes to the scene which Biggs(1979) described as *Achieving* and Ramsden(1981) as *strategic*.

A surface Approach is based on *extrinsic motivation*. It involves minimalist engagement with the task, focusing on *memorising* or applying procedures unreflectively (Ramsden, *et al.*, 1989). The student sees school learning as a mean towards some other end, such as obtaining a better job, or just keeping out of trouble. Learning then becomes a *balancing act* between avoiding failure and not working too hard (Biggs,1990). Then the strategy is to limit the target to essentials and reproducible through rote learning.

In contrast a Deep Approach is based on *intrinsic motivation*. It involves an *intention to understand* and give meaning. It focuses on relations between *parts of subject matter*, the author's message in

association with the evidence used to support it, or the structure of the problem as a whole.

It was predicted that interest would facilitate a Deep Approach, while anxiety would induce a Surface Approach (Entwistle, 1987). By definition, a Surface Approach results in incomplete understanding, because it distorts the structure of a text or problem. A Deep Approach is a necessary, but not a sufficient condition for understanding (Ramsden, *et al.*, 1989).

The third approach which is called Achieving or Strategic is related to the *competitive form of motivation* called need for achievement ('n' ach) or 'hope for success' (Entwistle, 1987). The related strategies refer to organising time, working space and syllabus coverage in the most efficient way (usually known as study skills). It couples *motivation* to perform well with good *study habits*.

The Surface and Deep Approaches are in some sense *mutually exclusive*. An Achieving Approach, however may be linked *either Surface or Deep*. Surface-achievers, for instance, systematically *rote learn selected details* to obtain high grades, while Deep-achievers are *organised and plan carefully* in their search for meaning (Biggs, 1990).

Experiments in Gothenburg and Lancaster have made it necessary to subdivide each of these Deep and Surface Approaches into two - *Deep Active, Deep Passive; Surface Active and Surface passive* respectively depending on the degree of activity, attention and involvement shown by the student.

These Approaches are *general tendencies* only. How a student behaves when facing a particular task depends on several other factors. It is the *Approach* which is categorised and not the *students*. Strategies adopted by the students may differ and hence they should be channelled accordingly.

2.1.2.4. Approach and Outcome

There has been a substantial amount of research focussing on the relationship between *qualitative differences* in students' Approaches to Studying and learning outcomes (Trigwell & Prosser, 1991). However, these studies were on learning outcome of students engaged in individual academic tasks such as reading an academic article and not on whole courses (Dahlgren, 1984; Marton & Saljo, 1984).

Study approaches are related to *learning outcomes* (Ramsden, *et al.*, 1989). There has been some focus on the relationship using differences in terms of students achievement as the outcome indicator (Svensson, 1977; Entwistle & Ramsden, 1983). These studies suggest that the relationship between approach and quantitative measure of learning outcome at the course level is somewhat equivocal, with correlations between approach and outcome being somewhat lower than might be expected. They have tended to confirm the *negative association* between *surface approaches* to study and qualitative differences in learning outcome, but not positive association between *deep approaches* and *qualitative differences*.

Marton and Saljo (1984) described such differences in terms of Surface and Deep approaches and termed a *phenomenographic* approach to

identifying learning outcomes (Marton, 1988). This has involved the identification of *qualitative differences* in outcomes from the *students' perspective*. Marton and Saljo (1996) have identified a close relationship between approach and outcome at the level of individual academic task.

There is considerable evidence that the *context* the teacher sets up directly affects students' approach to learning. First, the *structures* in the classroom, such as statement of objectives, assessment methods and teaching methods themselves communicate expectations to the student. Second, the *informal interactions* between teacher and student set up a classroom climate that communicates a diffuse, but powerful affective atmosphere, which produces a student reaction that in turn determines an approach to learning. If that reaction is one of anxiety, then surface learning follows; if of curiosity, then the deep learning follows (Biggs, 1990). Research on approaches to learning and studying gives strong support to the view that successful (quality) learning outcomes are aligned to deep and deep-achieving approaches and that students can be taught to adopt these approaches (Harvey, 1994).

2.1.2.5. Approaches to Studying and Learning Style: Concepts Distinguished

The last several years witnessed substantial number of researches into individual differences *in the way students learn*. It led to the development of numerous models of student learning that offer strikingly *different conceptualisations of the learning process* complex, like Approaches to Studying and Learning Style. For a long time researchers treated Approaches to Studying and Learning Style synonymously.

Approaches on the one hand and Learning Style on the other share some common features (Harvey, 1994). Both seek to develop and increase understanding of the differences in the way students learn and provide a sound conceptual frame work for evaluating individual differences. It helps to provide guidelines directed towards improving student learning outcomes.

In a significant study Harvey (1994) *differentiated* Approaches and Learning Style as *two different conceptualisations* of how students learn and study. The *Study Process Questionnaire (SPQ)* measured student's Surface, Deep and Achieving Approaches to Studying. The *productivity Environment Preference Survey (PEPS)* used to measure Learning Style. The findings indicated that the SPQ and the PEPS measured two different conceptualisations of how students learn.

It was appropriate to differentiate between the way students learn in terms of either Style-based or Approach - based constructs. The finding has important implications for users of these two instruments.

2.1.2.6. Measurement of Approaches to Studying

Review of literature on student learning revealed that many attempts were made across the world to develop appropriate instruments to measure learning process and *study approaches*. Traditionally these have emerged from a combination of mainstream psychology and personal experience. More recently concepts have been derived from the *qualitative analysis* of students' experiences of studying and subsequently operationalised

through inventories. The attempts to develop inventories are derived from pre-existing *theoretical rationales*.

a. Inventory of Learning Process (ILP)

The first serious attempt in this direction was made by Schmeck, *et al.* (1977) with the development of 62 items *Inventory of Learning Process (ILP)*. It was a self reporting inventory derived from the theoretical basis of *cognitive psychology* to assess *individual differences* in learning process. It categorised four main factors viz., Surface processing, Disorganised study method, Fact retention and Elaborative processing.

b. Study Process Questionnaire (SPQ)

Study Process Questionnaire (SPQ) developed by Biggs(1978) was widely used in Australia and else where to measure student's approaches to learning and studying. It included *10 unidimensional scales* to assess the study process of higher education students. These dimensions are Pragmatism, Academic motivation, Neuroticism, Internality, Study skills, Rote learning, Meaningful learning, Test anxiety, Openness and Class dependence. When factor analysed the SPQ showed a stable second order structure consisting of three dimensions. viz., *Reproducing, Internalising and Achieving*.

c. Approaches to Studying Inventory (ASI)

Entwistle, *et al.* (1979) developed an *Approaches to Studying Inventory (ASI)*. The items of the inventory were derived from the *interview comments of students*. It consisted of *three orientations* to study

viz., The Meaning, Reproducing and Achieving which were developed from an initial pool of 15 subscales.

d. Short Version of ASI

Entwistle. *et al.* (1979) framed a *short version of ASI* (30 items) included the scales viz., Achieving orientation, Reproducing orientation, Meaning orientation, Comprehension learning, Operation learning, Improvidence and Globetrotting.

e. Predetermined Set of Categories

Biggs and Collis (1982) from the more quantitative perspective have developed an approach to analysing quantitative differences in learning outcome using a *pre-determined set of categories* of description based upon the SOLO Taxonomy. Five categories are described in all, ranging from pre-structural to extended abstract.

f. Revised form of ASI

Entwistle and Ramsden (1983) revised the initial ASI by adding a new orientation, termed as the *Non-academic* orientation to study. This new version carries *64 items* and *four orientations* viz., The Meaning, Reproducing, Achieving and Non-academic.

g. Inventory of Learning Process (ILP)

Schmeck (1983) developed the *Inventory of Learning Process (ILP)* within the frame work of cognition, information processing and memory. It identified *four orientations* viz., Deep processing, Elaborate processing, Fact orientation and Methodical study.

h. Science Studying Approach Inventory (SSAI)

Pillai, *et al.* (1992) developed a *Science Studying Approach Inventory* (SSAI). It is meant to measure the *science studying approach* of secondary school pupils. It covers two aspects. viz., *Deep Approach versus Surface Approach* and *Organised study method versus Disorganised study method*.

2.1.3. CLASSROOM CLIMATE

Learning goals are derived from analysis of the kinds of tasks learners will be expected to perform and the competencies successful learners should exhibit. It is often difficult for learners to acknowledge and express the needs. Learners may be constrained by the early negative experiences of learning and need the context of a highly supportive and respectful environment to be able to recognise the needs and begin to explore them (Weil & Gill, 1989). Learning must involve the whole environment not just the intellect.

Formal and informal interaction of the pupil and the teacher, the relationship with other children in the classroom, the set up of the classroom - all these have an impact on the pupil's behaviour which in turn promote learning. It is in the classroom that the development of personality of child is brought about by the exposure to systematically planned experience together with unplanned experiences. The attainment of such educational objectives hinges up on proper educational environment.

It may be noted that the term *Classroom Environment* and *Classroom climate* are used synonymously as the idea contained in both are almost the same.

2.1.3.1. Classroom Climate : Meaning and Definitions

Classroom Climate is the *psychological* and *interpersonal* atmosphere inside the classroom. It is considered as a combination of both physical facilities and academic activities that are rationally expected by any student.

According to Fraser (1986) Classroom Climate might involve *relationships* between the teacher and students; school climate might involve relationships between the teacher and students and teaching colleagues, head of department usually measured in terms of either students or teacher perceptions. School environment is usually assessed in terms of *teacher perceptions*.

A number of definitions of Classroom Climate and Classroom Environment were put forth by different psychologists. Good (1973) defined Educational Environment as *the sum of all physical, social, economical and mental factors that contribute to the total teaching learning situation*. According to Page and Thomas (1977) Classroom Climate *authority pattern and social and emotional relationships within a teaching group*. Hawes and Hawes (1982) defined Classroom Climate as *the totality of external surroundings including conditions, circumstances and events in education often considered for the extend to which such surrounding facilitates learning*. Robert (1983) referred Classroom Climate to *the various psychological and social dimensions in the classroom such as degree of formality, flexibility, structure, anxiety, teacher control, activity and stimulation*. According to Husen and Postlethwaite (1994) Classroom Environment is *the climate or atmosphere of a class as a social*

group that potentially influences what students learn. The classroom environment refers to tangible aspects of contexts of teaching and learning.

On the basis of several findings it can be seen that Classroom Climate is the *environment prevailing in a classroom* when the process of teaching learning takes place. This include the emotional, physical and intellectual climate set up by teacher and students to create a wholesome learning situation. Classroom Environment depends not only on the physical factors of the classroom but on social emotional, educational and economic factors also and how students and teachers perceive the classroom situation for bringing about maximum *interpersonal relationships*, there by creating atmosphere for effective learning.

2.1.3.2. Classroom Climate : Varying Dimensions

Mc Donald (1959) described the Classroom Environment on several dimensions. One dimension is the method of *behaviour control* typically used in the classroom. A democratic classroom can be described as the one in which there is a large degree of permissiveness in the teacher pupil relationship. Pupils are allowed to select the work projects and they participate in decision about the learning activities, they are not closely supervised, but are allowed to work independently.

On the contrary an autocratic classroom may be described as the one which is *dominated by the teacher*. The teacher decides and imposes the goals of learning activities, the pupils do not participate in either the selection of learning activities or the goals of these activities.

Thelen (1981) described Classroom Climate in terms of three *constructs* (components) called *ALP components*. They are *Authenticity* - pupil involvement. That is pupils' meaningfulness, understanding and pleasant experiences in learning activities. *Legitimacy*: Pupil's satisfaction or purposefulness. That is pupil's effort in solving problems, concern for learning and preparing themselves for the purpose or aim in life. *Productivity*: Pupils goal attainment. That is pupils consciousness, effectiveness, potentials and self learning, in productive effectiveness, potentials and self learning, in productive learning activities. That is the climate of classroom is essentially the direction and extent to which these constructs operate in varied combinations creating a way of life of the class.

According to Hawes and Hawes (1982) Classroom Climate is the atmosphere and general environment in the classroom that may help or hinder the learning process. This include *physical* and *material sources*, *emotional tone* and *attitude of teacher*, *social attitudes of peers*, *rules* and *regulations*.

Several research findings show that there are number of essential *components* or dimensions for Classroom Climate. Teacher-student interaction, student-student interaction, student-teacher interaction assessment, reporting co-operation with parents, organisation of the classroom, classroom entertainments and physical conditions are considered as essential components of Classroom Climate. This componentwise approach (dimensional approach) will help for a better interpretation of Classroom Climate studies.

2.1.3.3. Classroom Climate and Learning Process : A Focus

Research evidences show that successful learning is not possible without proper environment. Learning climate is a strong sociological factor that can deeply influence academic achievement. The classroom psychological environment is the climate or atmosphere of the class as a *social group* that potentially influences what students learn.

Learning is an intellectual process providing the development and restructuring of existing conceptual schema. Classroom learning takes place within a complex social environment. It is necessary to understand how the class climate affects pupil's learning.

Students spend a vast amount of time at school. Jackson (1968) estimates that this is as high as approximately 7,000 hours by the end of primary school. Rutter and Smith (1979) suggests that this figure rises to 15,000 hours by the completion of secondary school. Students therefore, certainly have a large stake in what happens to them at school and students' reactions to and perceptions of their school experiences are significant. School evaluations and school-effects research have relied heavily and some times exclusively on the assessment of academic achievement and other valued learning outcomes (Fraser, 1986). Classroom Climate is such a potent determinant of student outcomes that it should *not be ignored by those wishing to improve the effectiveness of schools*. Drawing on Murray's work, Stern (1970) formulated a theory of *person-environment congruence* in which complimentary combinations of personal needs and environmental press enhance student outcomes. In school classes

personality needs, role expectations and classroom climate interact to predict *group behaviour including learning outcomes*.

The central assumption in Piaget's (1973) analysis of cognitive change was the belief that development depends upon a *continuous interaction* between organism and environment, an interaction which involves on the one hand, environmental forces (people, objects, events) acting up on the child and on the other hand, the child acting selectively upon the environment. This notion highlights the importance of Classroom Climate in learning process.

The main focus of learning environment is upon *students' and teachers' perceptions* of important psychological aspects of learning environment which pervade school classrooms. It is assumed that having constructive classroom environment is an intrinsically valuable goal of schooling (Fraser, 1986). Disparity in achievement is an indicator of the fact that there exists *individual differences* among learners and these individual differences should be *taken into account* when preparing instructional programmes. Instructional procedure cannot be made fruitful without active participation of the learner, who is a product of the interaction between self with all the innate potentialities and environment.

2.1.3.4. Measurement of Classroom Climate

Early works of Classroom Climate described classroom behaviour simply on the basis of *observations*, but later works assigned different values to different behaviours. This trend broadened after a time to examine relations between classroom measures and measures of pupil outcome.

Along with the change in focus there was a trend toward increasing differentiation of the concepts used to measure classroom behaviour.

The distinction between the *objective* approach of directly observing the environment and the *subjective* approach based on milieu inhabitants' apprehension of the environment is widely recognised in psychological literature. In particular Murray (1938) introduced the term *alpha press* to describe the environment as assessed by a detached observer and the term *beta press* to describe the perceived environment of milieu inhabitants.

Rosenshine (1970) made a distinction between *low inference* and *high inference* measures of classroom environment. Low inference measures tap specific explicit phenomena (eg., the number of student questions) whereas high inference measures require the respondent to make a judgement about the meaning of classroom event (eg., the degree of teacher friendliness). One of the most widely known low inference measures is Flander's (1970) *Interaction Analysis System* which was the most sophisticated technique for classroom observation available by the mid Sixties. This system records teacher behaviour at three second intervals using ten categories (accepting feelings, praising or encouraging, accepting or using student ideas, asking questions, lecturing, giving ideas, criticising student talk response, student initiated talk and silence or confusion).

A study of Classroom Climate can be done from different angles including the consideration of *pupil or teacher affective factors* like satisfaction, involvement, affiliation, innovation, apathy, democracy etc. A number of instruments for measuring Classroom Climate and environment are developed by various researchers. Some of them are the following.

a. Classroom Environment Scale (CES)

The CES was developed by Moos and Trickett (1974). It is a set of nine separate but somewhat similar instruments. The final version of the CES contains nine scales with 10 items of True/False response format in each scale. Example of items in CES are task orientation, teacher control and innovation. The CES has been designed to measure both *actual environment* and *preferred environment*. The scoring direction is reversed for half of the item in each scale.

b. Learning Environment Inventory (LEI)

This instrument was developed by Fraser, *et al.* (1982). The LEI has been so far used only to measure actual environment, although there appears to be no reason why LEI could not be used equally well as a basis for assessing preferred environment.

The final version of the LEI contains total of 105 statements descriptive of typical school classes. The respondent has to express degree of agreement with each statement on a four-point scale with response alternatives of Strongly Disagree, Disagree, Agree and Strongly Agree. Typical items of LEI are *cohesiveness*, *friction*, *speed* and *disorganisation*. The scoring direction is reversed for some items.

c. My Class Inventory (MCI)

It is an instrument developed by Fraser, *et al.* (1982). Although developed specifically for primary school children, MCI has been found to be very useful for junior high school students as well. It is a different form of LEI. For MCI a two point (YES/NO) format was used. The final version

of MCI contained 38 items. Typical items of MCI are *friction*, *difficulty* and *satisfaction*.

d. College and University Classroom Environment Inventory (CUCEI)

This instrument to measure classroom climate was developed by Fraser *et al.* (1984). The CUCEI is intended for use in small groups (up to 30 students). The final form of the CUCEI contains 49 items. Each item is responded to using the four categories of Agree, Strongly Agree, Disagree and Strongly Disagree. The scoring procedure is reversed for approximately half of the items in each scale. Typical items are *Task orientation* and *Individualisation*.

e. Individualised Classroom Environment Questionnaire (ICEQ)

This instrument was also developed by Fraser (1985). The final version of the ICEQ contained 50 items. Each item is responded on a five point scale with the alternatives of Almost Never, Seldom, Sometimes, Often and Very Often. The scoring direction is reversed for several items. Typical items are *Participation*, *Independence* and *Differentiation*. It has four separate forms which assess respectively, student perceptions of actual environment, student perceptions of preferred environment, teacher perceptions of actual environment and teacher perceptions of preferred environment.

f. Scale of Classroom Climate (SCC)

This scale was constructed by Pillai and Santhakumari (1992). It was designed to collect data from secondary school students on various *elements of classroom climate* that affect learning process.

g. Classroom Environment Inventory (CEI)

Pillai and Sunitha (1996) constructed CEI based on 'My Class Inventory' developed by Fraser, *et al.* (1982). This is a refined instrument to collect data about *primary school pupils' perception about their class environment.*

h. Scale of Classroom Climate (SCC)

Another SCC was developed by Usha and Sunitha (1997). It was framed to elicit secondary school pupils' perceptions on different elements of Classroom Climate. It includes *58 items* related to various aspects of Classroom Climate. The investigator utilised this instrument to collect data on Classroom Climate for the present study.

2.2. REVIEW OF RELATED STUDIES

This part presents a report of detailed survey conducted by the investigator on studies relating the Independent Variables viz., *Learning Style, Approaches to Studying* and *Classroom Climate* with *Achievement*. It includes Indian and foreign studies conducted during the period from 1979 to 2002. While some studies highlighted *positive relation* with Achievement some others revealed *negative* or *no relation*. Studies showing positive and negative or no relations are presented separately and it is followed by a summary of studies and meta analysis of reviewed studies.

2.2.1. STUDIES RELATING LEARNING STYLE WITH ACHIEVEMENT

The extensive review of studies relating Learning Style with Achievement revealed that a substantial number of studies in this line has

been reported from abroad and a limited number of studies in Indian context. The investigator collected a total of *seventy eight* studies conducted for the period from *1985 to 2002* of which *fifty three* studies revealed positive relation with Achievement and the remaining *twenty five* studies showed negative or no relation.

2.2.1.1. Studies Showing Positive Relation

The following studies are showing positive relation between *Learning Style* and *Achievement*.

Charkins (1985) reported about a study on linking teaching and student Learning Styles with student Achievement and Attitudes. Findings disclosed that student *Achievement and Attitude at College level might be improved by a better match between teaching style of instructors and the Learning Style of students*.

Smith and Holliday (1986) investigated the differences in Learning Styles as measured by the Learning Style Inventory (LSI). The subjects for the study were a sample of fourth, fifth and sixth graders in a midwestern elementary school. The findings were that the students do manifest *significant variations* in how they prefer to learn in a classroom setting. *The average achievers did not display a significant performance for a particular Learning Style, while the high and low achievers did*.

Inorder to prescribe instructional strategies that match individual Learning Styles *Allen (1987)* examined the relationships among students' gender, communication avoidance behaviour and classroom Achievement. Data collected on 389 undergraduate students indicated that *male students*

had a preference for more independent and avoidant Learning Style, while female students preferred collaborative and participative Learning Style.

Harpole (1987) made an effort to determine the relationship of gender and Learning Style to Achievement and Laboratory Skills of 41 male and female Chemistry students in grades 10 and 11 in a Mississippi high school. The results suggested that the planning of different types of laboratory activities for *males and females may enhance laboratory skills.*

Verma and Verma (1987) in a study on Learning Style of 120 adolescents found that there are *significant differences in Achievement in various subjects* and total areas of study based on Learning Style adopted by adolescents.

Atchison (1988) conducted a study to determine the relationship of Learning Style and Reading Achievement of sixth grade students and found *statistically significant relationship between Learning Style and Total Reading Achievement Scores.*

Dunn and Griggs (1990) examined the relationship between learner style preference and instructional grouping on 104 middle school students. Three preference groups were identified: learning alone, learning with peers, no preference. Found that *students performed equally well on four social studies lessons when instructional strategy matched learner with preferred learning style.*

Green, et al. (1990) studied the relationship between Learning Style and Vocational Attributes on 147 college students using Kolb's LSI.

Learning Style seemed to be related to students ability to decide on an academic major interest in working with people or qualitative ability.

Farrel-Moskwa (1992) investigated the correlation between student's Learning Style and Academic Achievement of 58 fifth grade students in a suburban middle school. Results indicated that, overall, there was a negligible relationship between Learning Style and Academic Achievement, but that there did seem to be *a relationship between certain Learning Style and Academic Performances.*

Cooper and Miller (1992) assessed Learning Style of 113 students and Teaching Style of 16 faculty within a college of business using Myers-Briggs Type Indicator (MBTI) and found that *Learning Style-Teaching Style congruency was related to Academic Performance.*

Barbara (1993) reported a study on Effects of Learning Style Intervention on 1089 college students' Retention and Achievement. Results revealed that *students in the highest intensity group achieve significantly higher grade point average and higher retention rates than those in other groups.*

Carthey (1993) studied the relationship between Learning Style and Academic Achievement on 64 second year Iowa community college students. Findings suggested that *instructors should consider testing their students to determine their Learning Styles* so as to increase Academic Achievement.

Corlett (1993) examined the Learning Style Profiles of 99 elementary and 47 secondary student teachers by administering a Reading Style

Inventory based on LSI and revealed *higher visual style being positively related to higher grades.*

Allred and Holliday (1995) studied a brain-based approach to helping students reach their full potential in a South Carolina school. Examination of faculty teaching style and student Learning Style revealed that *only high achiever's Learning Style matched their teachers' fact-based approaches.*

Experimental studies based on Dunn and Dunn Learning Style Model (conducted between 1980-1990) were identified by *Dunn (1995)* to determine the value of teaching students through their Learning Style preferences. Meta-analysis determined that *matching students' Learning Style preferences with educational interventions compatible with those preferences is beneficial to their academic achievement.*

Dunn and Griggs (1995) revealed the similarities and differences among the Learning Style of culturally diverse population and describes how to teach and counsel adolescents with different Learning Style. Data collected from more than 18 professors and 60 doctoral students working collaboratively at St. John's University in New York. The results revealed that *students whose instruction was not responsive to their Learning Style achieved significantly less than children whose instruction was responsive.*

Grimes (1995) utilised a diagnostic, perspective model (N = 394) in identification of Learning Style and learning-study strategies of diverse student groups and in the analysis of perspective methods to address their specific needs. High-risk groups demonstrated *auditory, tactile concrete*

and group Learning Style preferences and were weaker on cognitive, goal-oriented and effort related strategies.

Lindvall (1995) described a programme employing the theory of multiple intelligences and individual Learning Style in order to make learning more active. 17 third grade students in the targeted classroom of an elementary school were surveyed. The results indicated that analysing students' needs and preferences and making accommodations to conform to those needs in the classroom, encouraged students to become *increasingly engaged in their learning.*

Mathews and Jones (1995) from their investigations of Learning Style of 101 Blacks, 226 Whites and seven other races in Teacher-training programme showed *the selection of social and conceptual style of learning as their predominant styles.* Study also confirmed *significant difference between black and whites in their Learning Style.*

Matthews (1995) examined the Learning Style of post-secondary students in selected institutions throughout South Carolina. The sample included over 200 college students and over 600 high school students. The study found that *first-year college students preferred social and conceptual style of learning to other styles,* and that students with *applied style performed better* in school and scored higher on standardised tests than did students with other style.

Borg and Shapiro (1996) utilised the Myers-Briggs Type Indicator (MBTI) to delineate four basic personality types and their corresponding Learning Style. The study compared Students Learning Style with

professor's teaching style. The findings suggested options for improving instruction by offering teaching and grading strategies that *better accommodate student personality types and Learning Style*.

Boulmetis and Sabula (1996) investigated Achievement Gains via instruction that matches Learning Style perceptual preferences of a sample of 63 nursing students. Nutrition instruction using the modality was given to one group and the other group was taught using another style. Results revealed that *instruction matched Learning Style scores were significantly higher on a nutrition achievement test*.

Hall and Hyle (1996) examined the relationship between Achievement and Learning Style of middle school students. Subjects were chosen from one urban middle school. Analysis of data revealed that *traditional classroom settings may not provide sufficient environmental options to enable students to recognize their Learning Style preference*.

Matthews (1996) investigated Learning Style and Perceived Academic Achievement of High School students. The results showed that students with Learning Style favouring a deemphasis on human relationships and an emphasis on deductive thinking *rated themselves higher academically than did their peers with other style of learning*.

Preetha (1996) investigated the influence of Learning Style and Achievement Motivation on Achievement in Biology on 650 secondary school students. Results showed that the *main effect of Learning Style is significant for total sample and all the sub samples except boys, rural boys and urban girls out of the nine ANOVA employed*.

Rehna (1996) examined the interaction effect of Learning Style and Approaches to Studying on Achievement in Biology of 700 IX standard students. Results indicated that the *main effect of Learning Style on Achievement in Biology was significant, but not so with approaches to studying.*

Sathy (1996) investigated Learning Style among secondary school pupils with Learning Style Inventory and found that *Learning Style was significantly correlated with Achievement in Hindi.*

Braio, et al. (1997) in a study introduced varied Learning Style strategies in five stages to special education and low-achieving general education students. Pre- and post-tests of reading achievement in each phase and assessment of students' Learning Style preferences indicated that *students with Learning Style preferences benefited from Learning Style accommodations, especially special education students.*

Balach (1997) reported the formation of a committee to analyse the schools' problems and the reason for low test scores and low achievement in a Georgia High school. Teachers were asked to choose among four alternative teaching strategies including Learning Style. Pretest data from 1994-95 and post test data from the end of the 1995-96 school year measured *progress related to scores on the Tests of Achievement and Proficiency (TAP) for approximately 150 students. Test scores did improve.*

Dreher (1997) studied the implications for Learning and Teaching style among 10 high school seniors in a small rural high school. The study briefly described various Learning Styles and recommended that *teachers*

adapt instruction to students' Learning Style to improve student motivation and allow students to reach their full potential.

Ikegulu (1997) studied the effectiveness of medical instructional strategies in culturally and linguistically diverse learning environments and its relationship to various Learning Style. Findings suggested that *culturally relevant curricula and instructional techniques should relate experientially and personally to the cognitive, academic, social and linguistic abilities of students.*

Kumar (1997) investigated the effect of Learning Style on Achievement in Secondary School Biology on 650 students. Analysis of the data indicated that Learning Style has *significant main effect on Achievement in Biology.*

Kumar (1997a) studied the differences in Approaches to Studying and Learning Style between High-Achievers and Low-Achievers in Secondary School Biology. 350 IX standard pupils were selected as sample. The findings reported that there is *significant differences between High and Low-Achievers based on their Learning Style.*

Prasanna (1997) studied Learning Style in relation to Intelligence and Cognitive Style of secondary school pupils on 700 IX class students. The findings revealed that Learning Style is *positively and significantly correlated with intelligence and partially correlated with cognitive style.*

Van and Cita (1997) investigated individual differences in students' Problem Based Learning Style behaviour and its effect on Achievement using 164 health science students in the Netherlands. Results indicated that

Achievement is significantly influenced by the activity of Problem Based Learning Style behaviour.

A study was conducted by *Warren (1997)* to gather information on 163 students participating in Supplemental Instruction (SI) at the University of Central Florida. Results showed that *science students displayed assimilator and converger Learning Style while non-science students displayed accommodator Learning Style.*

Balas and Mascazine (1998) reported a study on general Biology students (N = 24) in a college environment in the Columbus Ohio area. Comparisons are made between Student Learning Style and Perceptual modalities. The results revealed that *student achievement increased with choice* and the use of a variety of teaching techniques is beneficial to college science teaching.

Burns, et al. (1998) investigated Learning Style differences of 500 students in grade 4-8 using the Learning Style Inventory. *Overall differences were found between average and above average achieving students in Learning Style preferences.*

Dwyer (1998) studied the communication Apprehension and Learning Style Preference and found that *trait and context communication apprehension correlate significantly with Learning Style preferences for women, but not for men.* Communication apprehension is not correlated with age, sex or self-reported grade-point average, but *Learning Style preference is correlated with GPA and Sex.*

Miller (1998) in a study compared classes in anatomy and sonography both taught using lectures and Programmed Learning

Sequence (PLS) in book format. Achievement was higher with PLS than lecture. There was a *significant correlation between Learning Style preferences and Achievement*.

Bhargavi (1999) conducted a study to find out the relation between Learning Style and Classroom Climate on a total sample of 700 pupils. Results indicated a *positive correlation between Learning Style and Classroom Climate*.

Geiser (1999) examined the effects of traditional versus learning style responsive study strategies on eighth graders' Mathematics Achievement and Attitudes. The study found that students applying Language Style responsive strategies had *significantly higher mathematics achievement* and attitude scores than students using traditional strategies.

Hong and Lee (1999) investigated the effect of parental awareness of their children's home work style on academic achievement. Results indicated that a *higher degree of parental awareness of the child's home work style preferences was associated with a child having higher achievement*.

Mac Kinnon (1999) reported a study of motivation among 36 University of Hong Kong first year students. Results indicated significant changes in Learning Style preferences from teacher-dependent to more active/independent formats. *Achievement and motivation improved*.

Moustafa (1999) examined how Learning Style theory is related to multisensory approaches to teaching and discussed how educational programmes using these approaches have been effective in improving

student Achievement. The findings suggested the *teachers to identify their student's Learning Style and take them into consideration when designing instruction.*

.Warren (1999) investigated the effects of faculty Learning Style on students' grades in five different class sections at the University of Central Florida. Results from two of the five classes indicated that *students with a Learning Style matching that of the instructor tended to have higher grade averages.*

Garton, et al. (2000) found that college freshmen who preferred field-independent and field neutral learning styles had higher grade point averages. *Learning style scores best predicted student retention.*

Thomas, et al. (2000) studied Learning Style preferences of Japanese college students pursuing an undergraduate degree at a New Zealand college. Results revealed the most preferred sensory styles to be kinesthetic, auditory, tactile and hands-on. There was a *significant relationship between kinesthetic style preference and higher grade in the practical, skill based course.*

.Wingenbach (2000) in a study found that students with a field independent learning style scored *significantly higher than field-dependent students.*

– Drysdale, et al. (2001) investigated the effects of cognitive learning style on first year academic performance in 19 University courses. Results revealed that *academic performance based on learning style was significant in 11 courses. All learning styles excelled in liberal arts and social sciences.*

Dunn, et al. (2001) examined the multiple intelligences learning styles. *Focus on the Dunn and Dunn Learning Style model that identifies individual preferences* for specific instructional environments, strategies and resources and the extend to which they *affect academic achievement*.

Mc Shannon (2001) studied the effects of a faculty development programme offered to increase positive interactions between students and faculty and the effects of these interactions on student achievement and retention. Students enrolled in eight engineering classes (N = 677) completed an interactive learning style instrument to show their preferred learning style. Results reported *an average increase of nine percent in student retention and achievement*.

Doss and Muthiah (2002) conducted a study to find out the types of Learning Styles prevalent among college students and to correlate styles of learning with academic performance on 925 college students in Tamil Nadu. The results revealed that the *predominant styles of learning among the college students are collaborative styles and their academic performance is related to their Learning Styles*.

2.2.1.2. Studies Showing Negative or No Relation

The following studies reported negative or no relationship between *Learning Style* and *Achievement*.

Hanpol (1987) studied the relationship between Learning Style and Achievement of 74 Thai University students and found *no statistically significant relationship between Learning Style and Achievement*.

Sanley (1987) examined the Learning Style and Learning Modalities related to problem solving on 180 freshmen college preparatory students

and found *no relationship between Learning style or Learning Modalities and Problem Solving Success.*

Cynthia (1988) studied the relationship of match or mismatch of student and teacher Learning Style preference and the formation of teacher expectations of student achievement. It was found that *match or mismatch of student and teachers Learning Style preference* and attitude towards school *did not contribute significantly to Achievement.*

Horazdovsky (1988) with a sample of 101 students of business course studied preferred Learning Style profiles of students. Kolb's Learning Style Inventory was used for collecting data regarding Learning Style. Results showed that *active-reflective scale scores did not have an effect on group mean achievement.*

Knight (1990) studied the effects of Learning Style Accommodation on Achievement of second graders. Results showed that *control groups received higher grades on Mathematics and language than the experimental group*, who were taught in accordance with Teacher's unique Language Style.

Leiden, et al. (1990) assessed LSI and their prediction on academic performance of 79 medical students. The results reported a *low, non-significant correlation between the measures of Learning Style and Academic Achievement.*

Thompson and O'Brien (1991) made an attempt to measure the effect on course grades of the relationship between matched and mismatched teaching and learning style and between Learning Style and student age

and gender of 207 students. It was found that *no significant main effects were present for either student learning style or matched and mismatched conditions.*

Orr and Davidson (1993) studied the effect of group computer-based instruction and Learning Style on Achievement and attitude for 190 elementary school students in Austin (Texas). Results *did not support the hypothesis of interaction between instructional delivery and Learning Style for both performance and attitude.*

Harasym (1995) compared the results from Gregoric Style Delineator (GSD), administered to 260 undergraduate nursing students in human anatomy and physiology course. Results revealed there is *no relationship between Learning Style and Achievement in anatomy and physiology.*

Dale and Liss (1996) described an experience of introducing a Records of Achievement Scheme in University extramural language courses. The article discussed the effectiveness of existing teaching/learning styles and examines the way in which records of achievement could foster autonomous learning. *Student reaction to recording progress as a means of sustaining learning achievement was negative.*

Howie (1996) investigated the reading style of 57 students in grades III, IV and V. The results appeared that *no one element of Learning Style was the contributing factor to improved Academic Achievement.*

Melara (1996) examined the effect of Learning Style on the performance of college students (N=40) within two different hyper text

structures. Results indicated that network structures accommodated Learning Style better than hierarchical structures; and *no significant difference was found in the learner's achievement.*

Horton and Oakland (1997) in a study tested the hypothesis that students learn best when teachers use strategies consistent with students' temperament-based learning style. Analysis of 417 seventh graders *did not support the hypothesis - student achievement was significantly higher when instructional strategies that were designed to promote personalised learning were used.*

Santhosh Kumar (1997) investigated the influence of Learning Style and Gender on Achievement in Chemistry of 591 IX standard students. The findings revealed that there is *no significant single effect of Learning Style and Gender on Achievement for the total sample and sub samples.*

Van and Cita (1997) investigated individual differences in student's Problem Based Learning (PBL) behaviour and its effect on Achievement using 164 health science students in the Netherlands. Results indicated that *the style of PBL did not yield a significant contribution.*

Day, et al. (1998) examined the effects of World Wide Web Instruction and Traditional Instruction and Learning Style on Achievement. Traditional instruction in technical writing was given to 29 students and 29 were instructed via the World Wide Web. Examination scores and Group Embedded Figures Test results showed *no correlation between Learning Style and Achievement or attitudes.*

Shih, et al. (1998) designed a study to examine how students with different Learning Style functioned in World Wide Web-based courses offered at Iowa State University. The population for the study was 99 students taking two non-major web-based introductory courses. Results indicated that Learning Style, pattern of learning toward web-based instruction, and student characteristics *did not have an effect on web-based learning achievement.*

Garton, et al. (1999) studied the relationship between Learning Style and Achievement among 187 animal science students. *Achievement was not significantly correlated with Learning Style.*

Gopalan (1999) in a study tried to find out the differences exist in Learning Style scores of Sex and Locale. The sample consisted of 700 IX class students. *No significant difference could be noticed between boys and girls and between rural and urban samples with regard to Learning Style.*

In a study *Marszalek and Lockard (1999)* investigated and compared the level of initial and long-term retention of frog internal anatomy among 280 students. Additional data on student's preferred Learning Style were used to explore possible interaction effects with their respective instructional activity. *No significant difference in achievement by Learning Style was observed.*

Miller and Polito (1999) grouped college agriculture students into co-operative learning teams based on their Learning Style: field dependent, field independent, field neutral or mixed. Results showed that *teams with heterogeneous Learning Styles did not perform better than homogeneous teams.*

Stickler, et al. (1999) collected Kolb Learning Style Inventory data from veterinary medical students and compared the data with transcript and career data. *Found that students have diverse learning styles do not appear to influence completion of the curriculum or future professional activities.*

Seng and Yeo (2000) in a study explored the role of cognitive style, spatial visualisation in student achievement. Results revealed that *there are no significant differences in learning style preferences from three brain dominance group.*

The influence of learning style preferences on student success in Online versus Face-to-Face Environments was studied by Steven, et al. (2000). Results reported *no significant relationship between preferences and course success* for the Online students. Findings suggest *students can be equally successful in both environments regardless of learning style preferences.*

Andrusyszyn, et al. (2001) in a study on Learning Style preferences reported that nurse practitioner students (N = 86) using distance education indicated a preference for self-direction, concrete examples and small-group discussion. *Delivery method or learning style was found less important than convenience, self-direction and timing.*

2.2.1.3. Summary of Studies Relating Learning Style with Achievement

A summary of studies relating Learning Style with Achievement is presented as follows in the chronological order. Studies showing positive relation are followed by studies showing negative relation with Achievement.

POSITIVE RELATION			
Sl. No.	Author	Year	Result
1.	Charkins	1985	Achievement improved by matching Teaching Style and Learning Style
2.	Smith and Holliday	1986	Students manifested variations in Learning Style preferences
3.	Allen	1987	Male and female students differed in Learning Style preferences
4.	Harpole	1987	Males and Females enhanced Laboratory Skills
5.	Verma and Verma	1987	Significant differences in Achievement
6.	Atchison	1988	Significant relationship between Learning Style and Reading Achievement
7.	Dunn and Griggs	1990	Students performed well when Learning Style preferences matched
8.	Green, <i>et al.</i>	1990	Learning Style related to student's ability to decide on academic interest
9.	Farrel-Moskwa	1992	Positive relationship between Learning Style and Achievement
10.	Cooper and Miller	1992	Learning Style – Teaching Style congruency related to Academic Performance
11.	Barbara	1993	Students in the highest intensity group achieved higher grade
12.	Carthey	1993	Instruction to test their students' Learning Style to increase Academic Achievement

contd.....

13.	Corlett	1993	Higher visual style positively related to higher grades
14.	Allred and Holliday	1995	High achiever's Learning Style matched their teachers' fact-based approaches
15.	Dunn	1995	Learning Style preferences contributed to Achievement
16.	Dunn and Griggs	1995	High achievement for children whose instruction was responsive to Learning Style
17.	Grimes	1995	High risk group demonstrated auditory, tactile concrete and group Learning Style preferences
18.	Lindvall	1995	Students increasingly engaged in learning
19.	Mathews and Jones	1995	Social and conceptual style of learning as predominant styles
20.	Matthews	1995	Students with applied style performed better
21.	Borg and Shapiro	1996	Better accommodation of student personality types and Learning Style
22.	Boulmetis and Sabula	1996	Instruction matched Learning Style scored significantly higher
23.	Hall and Hyle	1996	Environmental options needed to recognise Learning Style preferences
24.	Matthews	1996	Learning Style with deductive thinking rated high achievement
25.	Preetha	1996	Significant main effect of Learning Style
26.	Rehna	1996	Main effect of Learning Style significant on Achievement

contd.....

27.	Sathy	1996	Learning Style significantly correlated with Achievement
28.	Braio, <i>et al.</i>	1997	Benefitted by Learning Style preferences
29.	Balach	1997	Test scores improved
30.	Dreher	1997	Teachers to adapt instruction according to students' Learning Style
31.	Ikegulu	1997	Instructional techniques should relate to Learning Style
32.	Kumar	1997	Significant main effect on Achievement in Biology
33.	Kumar	1997a	Significant difference between high and low achievers based on Learning Style
34.	Prasanna	1997	Positively and significantly correlated with intelligence
35.	Van and Cita	1997	Achievement is significantly influenced by Learning Style
36.	Warren	1997	Science and Non-Science students displayed Learning Style
37.	Balas and Mascazine	1998	Achievement increased with choice
38.	Burns, <i>et al.</i>	1998	Achievement related to Learning Style preferences.
39.	Dwyer	1998	Communication apprehension significantly correlated with Learning Style
40.	Miller	1998	Learning Style preferences and Achievement are significantly correlated

contd.....

41.	Bhargavi	1999	Positive correlation between Learning Style and Classroom Climate
42.	Geiser	1999	Achievement in Mathematics significantly higher
43.	Hong and Lee	1999	Parental awareness of home work style improved Achievement
44.	Mac Kinnon	1999	Achievement and Motivation improved
45.	Moustafa	1999	Teachers to consider students' Learning Style
46.	Warren	1999	Matched Learning Style contributed higher grade
47.	Garton, <i>et al.</i>	2000	Learning Style predicted student retention
48.	Thomas, <i>et al.</i>	2000	Significant relationship between style preference and higher grade
49.	Wingenbach	2000	Field independent Learning Style scored significantly higher.
50.	Drysdale, <i>et al.</i>	2001	Learning styles excelled in liberal arts and social sciences
51.	Dunn, <i>et al.</i>	2001	Learning Style preferences affected Academic Achievement
52.	Mc Shannon	2001	Student retention and achievement increased
53.	Doss and Muthiah	2002	Academic performance is related to Learning Style
NEGATIVE OR NO RELATION			
53.	Hanpol	1987	No significant relationship between Learning Style and Achievement

contd.....

54.	Sanley	1987	No relationship between Learning Style and Problem Solving success
55.	Cynthia	1988	Learning style preferences did not contribute to Achievement
56.	Horazdovsky	1988	No effect on group mean achievement
57.	Knight	1990	Experimental group received lower grades on Mathematics and Language
58.	Leiden, <i>et al.</i>	1990	Low non-significant correlation between Learning Style and Achievement
59.	Thompson and O'Brien	1991	No significant main effect between Learning Style and matched conditions
60.	Orr and Davidson	1993	No interaction between instructional delivery and Learning Style
61.	Harasym	1995	No relationship between Learning Style and Achievement
62.	Dale and Liss	1996	Students reaction to recording progress was negative
63.	Howie	1996	Learning Style not a contributing factor of Achievement
64.	Melara	1996	No significant difference in Achievement
65.	Horton and Oakland	1997	Students' achievement was not significantly higher
66.	Santhosh Kumar	1997	No significant single effect of Learning Style on Achievement
67.	Van and Cita	1997	Style of problem based Learning did not yield significant contribution

contd.....

68.	Day, <i>et al.</i>	1998	No correlation between Learning Style and Achievement
69.	Shih, <i>et al.</i>	1998	Learning style did not have an effect on web-based Learning Achievement
70.	Garton, <i>et al.</i>	1999	Achievement was not significantly correlated with Learning Style
71.	Gopalan	1999	No significant difference between Boys and Girls and between Rural and Urban samples
72.	Marszalek and Lockard	1999	No significant difference in Achievement by Learning Style
73.	Miller and Polito	1999	No better performance
74.	Stickle, <i>et al.</i>	1999	Learning Style did not influence Achievement
75.	Seng and Yeo	2000	No significant difference in Learning Style preferences
76.	Steven, <i>et al.</i>	2000	No significant relationship between preferences and course success
77.	Andrusyszyn, <i>et al.</i>	2001	Learning Style was found less important.

2.2.2. STUDIES RELATING APPROACHES TO STUDYING WITH ACHIEVEMENT

Most of the studies relating *Approaches to Studying* and *Achievement* have been conducted abroad. A few studies in Indian context have also been located. The investigator reviewed altogether *fifty one* studies that belong to the period between 1979 and 2000. While *forty two*

studies reported positive relation, the remaining *nine* revealed negative or no relation with Achievement.

2.2.2.1. Studies Showing Positive Relation

The following studies show positive relationship between *Approaches to Studying* and *Achievement*.

Biggs (1979) investigated and found *Deep Approach leading to superior performance and Surface Approach usually related negatively to institutional grades* and effective for recalling unrelated details.

Ramsden and Laurillard (1979) reported that the variability in Approach is partly function of *difference between individual academic tasks*. But there was also evidence that the students respond to the context of learning defined by the teaching and assessment methods of academic departments.

Watkins, et al. (1986) examined the learning processes of 212 male and 213 female Filipino students. Findings revealed *a Deep level, Competitive, Well Organised Approach being related to Academic Success*.

Entwistle and Waterston (1988) investigated Approaches to Studying and Levels of Processing in 117 Science and 101 Arts University students. Results reported *Surface Processing being correlated to Surface Approach and Elaborative Processing to Deep Approach*.

Hattie and Watkins (1988) explored the Preferred Classroom Environment and Approaches to Learning of 1266 Australian school students. Results indicated *a relationship between Approaches to Studying and high quality learning outcomes*.

Speth and Brown (1988) in a factor analytic study on Study Processes and Strategies found *Surface Approach linked to Failure and Deep Approach to Elaborative Processing.*

While interpreting the factor analysis from Approaches to Studying Inventory *Harper and Kember (1989)* reported that students who score high on Deep Approach factor show Deep outcome.

Beina (1989) examined the influence of Science Learning environment and Science learning Approach in predicting Achievement in Biology on 675 class IX students. The results indicated *a significant positive correlation between Science Learning Approach and Achievement in Biology.*

Uzhunnan (1989) conducted a comparative study of Science Learning Approach and Science Learning Environment among High, Average and Low creative groups of 600 pupils of standard IX. Results indicated a *significant difference existing in Science Learning Approach among these groups.*

Duckwall (1990) surveyed 100 freshmen university students using the Lancaster Approaches to Studying Inventory to study the effect of different Approaches to Learning on their success. Analysis of results revealed that there were *some relationships between Approaches to Learning and Academic success.*

Watkins and Hattie (1990) examined the Approaches to Learning of secondary school students and reported a *positive correlation between subject's level of self-esteem and their perceptions of the learning*

environment as enjoyable with both Deep and Achieving Approaches to Learning. Subjects with more versatile Learning Strategies were also more Academically successful.

Majeedu (1990) in his study on Learning Approaches and Science knowledge of secondary school pupils revealed that there is significant difference between science knowledge and Learning Approaches.

Boujaoude and Giuliano (1991) investigated the relationship between students' Approaches to Studying, formal reasoning ability, prior knowledge, gender and Achievement in Chemistry of 199 students in New York state. The results showed that meaning orientation accounted for 32% of the variance on the final scores.

Trigwell and Prosser (1991) studied the relationship between Approaches to Studying and Quality of Learning Outcomes. 122 final year nursing students were chosen as subjects. Results indicated a positive relationship between the variables through correlation and factor analysis.

Pillai and Naseema (1991) investigated the determinants of Achievement in Physics on a sample of 600 secondary school students. Findings reported significant and positive but low relationship between science Learning Approach and Achievement in Physics.

Ekins (1992) examined the skills and Approaches to Study of 549 undergraduate from Hong Kong/Macau. Using Bigg's Study Process Questionnaire (SPQ) three dimensions of students' study strategies were identified, viz., Surface, Deep and Achieving. The results concluded that deep motivation was a key to success.

Wong (1992) conducted a survey of 89 on-campus and 50 teleconferencing students and it showed that *external students had higher scores for intrinsic motivation, interrelating ideas, and deep approach, internal students for fear of failure, surface approach, achievement motivation and extrinsic motivation.*

Mayer and Dunne (1992) compared the Approaches to Learning of 45 failing and 221 achieving college students by examining related contextual and approach variables. The results revealed that the *Approach to study of failing students were found difficult to interpret. It was concluded that the combined set of contextual variables explain significantly more of the variations in study approaches than the set of conventional variables.*

Schmeck and Geisler-Brenstein (1992) investigated qualitative and quantitative cognitive functioning that affect student learning in terms of their Approaches to study. Findings suggested *the origin of different style or approaches and showed how perceptions and motivation interact to shape experience.*

Asmali (1992) examined the Science Studying Approach of secondary school pupils. The study revealed that *significant sex difference (two out of three comparisons) and rural-urban difference exist in Science Studying Approach (total score).*

Anilkumar (1992) studied the impact of Socio-Economic Status and Science Studying Approach on Achievement in Science of 700 secondary school pupils. Findings revealed a *significant main effect of Science Studying Approach on Achievement for the total sample.*

Jayaseelan (1992) investigated the influence of Achievement Motivation and Science Studying Approach on Achievement in Biology of 675 standard IX students. The results revealed a *significant relationship between Science Studying Approach and Science Achievement*.

Horn (1993) explored the roles played by Knowledge, Approaches to Study and motivational variables in academic success of 104 undergraduates. A path model was proposed and tested, providing a basis for beginning to *understand how the Approaches to Study students select may mediate between knowledge, beliefs and Achievement*.

Kumar (1993) studied the Interaction Effect of Intelligence, Cognitive Style and Approaches to Studying on Achievement in Biology of 700 pupils of standard IX. The study reported *significant main effect of Approaches to Studying on Achievement in Biology*.

Areefa (1993) examined the group differences in Approaches to Studying Science of 563 secondary school pupils and reported that *there is significant difference between girls and boys in Science Studying Approach*.

Boujaoude and Giuliano (1994) investigated the relationship between students' Approaches to Studying, prior knowledge, logical thinking and their performance in Chemistry course (N=220). It was found that *prior knowledge was the best predictor of Achievement, followed by formal reasoning ability*.

Kumar (1994) examined the interaction of Achievement Motivation and Approaches to Studying on Achievement in Biology of 700 secondary school pupils. Findings of the study reported *significant main effect of Approaches to Studying on Achievement in Biology*.

Pillai and Kumar (1994) explored whether variations in Achievement in Biology of secondary school pupils was depended on variables like Sex, Locale, Cognitive Style and Approaches to Studying Science. The analysis of the data from 700 secondary school students revealed a *main effect of Locale, Cognitive Style and Approaches to Studying on Achievement in Biology*.

Richardson (1995) compared the study skills of 38 adult and 60 traditional-age college students in the same course. It was found that *older students had significantly higher scores on meaning orientation and lower scores on reproducing orientation and had persistence and educational attainment at least as high as that of traditional-age students*.

Kember (1995) investigated the study habits and Approaches to Study tasks of 34 mechanical engineering students. It was found that use of a *Surface Approach to learning was positively correlated with high class attendance and greater study time*.

Abouserie (1995) in a study of 135 undergraduate students suggested that students' personality traits in general and their self-esteem and achievement motivation in particular, have a *substantial influence on their Approaches to Study and levels of knowledge processing*.

John (1995) studied certain motivational variables and Approaches to Studying as predictor of process outcomes in Physics of 480 class IX students. Findings revealed that there existed *significant differences between process outcome groups and Approaches to Studying*.

Pillai (1995) investigated the influence of Cognitive Style and Approaches to Studying on process outcome in Physics of 500 students of

standard IX. *The main effect of Cognitive Style and Approaches to Studying on Process Outcomes in Physics was found significant.*

Bolen, et al. (1995) assessed the factorial structure of Study Process Questionnaire (SPQ) with 532 U.S. students and found that *Surface Approach like Deep Approach was goal oriented but attempted to get it with minimum work.*

Frontera and Horowitz (1995) assessed the Reading and Study Behaviour of 54 fourth graders and revealed that *successful students tend to have superior organisation.*

The cultural specificity of Approaches to Studying in higher education was investigated by *Richardson (1995)* on American and British University students. Findings concluded that *these basic orientations are distinctive to each particular cultural context.*

Pillai and Kumar (1996) explored the casual relationship of Intelligence, Cognitive Style and Approaches to Studying and Achievement in Secondary School Biology. The sample consisted of 700 standard IX students. Findings indicated that *Approaches to Studying has a direct effect on Achievement in Biology.*

Fogarty and Taylor (1997) administered Approaches to Studying Inventory to 503 adult students most returning to study after many years. Results suggested *learning orientations are fundamental and identifiable in students returning to study after long absence.*

Kumar (1997a) investigated the differences in Approaches to Studying and Learning Style between High-Achievers and Low-Achievers

in Secondary School Biology. The sample consisted of 350 standard IX students and the results revealed that *significant differences between High and Low-Achievers based on their Approaches to Studying*.

Kumar (1998) studied the impact of Approaches to Studying and Cognitive Style on Achievement in Biology of 700 secondary school pupils. Results indicated that *Approaches to Studying has significant main effect on Achievement in Biology*.

Richardson, et al. (1999) investigated the study approaches of students in upper-division distance learning courses at Britain's Open University. It was found that *study approaches of upper-division students were affected by background variables and were more closely related to the avowed aims of higher education than to those found among lower division distance-education students*.

Pimparyon, et al. (2000) examined the relationship among students' approaches to learning, their perceptions of the educational environment and their academic achievement using the Approaches to Studying Questionnaire (ASQ) and the Medical Education Environment Measure (MEEM). Results reported the usefulness of using these two instruments as *diagnostic measurements tools to enhance learning outcomes* at a health care profession institute.

2.2.2.2. Studies Showing Negative or No Relation

The following studies show negative relationship between *Approaches to Studying* and *Achievement*.

While interpreting the factor analysis from Approaches to Studying Inventory *Harper and Kember (1989)* reported that students who *score high on Surface Approach factor probably show a negative outcome.*

Lyn, et al. (1989) explored the Approaches to Learning and Learning Style of first year and final University students. It was found *changes toward less desirable learning approaches might be due to contextual variables such as curriculum demands, work load, time pressure and didactic teaching.*

Naseema (1989) studied the effect of Intelligence and Science Learning Approach on Achievement in Physics. Sample consisted of 600 standard IX pupils. Findings show *a low positive relationship between Science Learning Approach and Achievement in Physics.*

Tooth, et al. (1992) found that on 1986 medical school students' study habits showed declining Deep and Strategic Approaches and increasing Surface Approaches. *Surface learning correlated with poor performance and was a result of previous poor sessional examination performance.*

Prasad (1995) investigated the interaction of Approaches to Studying and Achievement Motivation on Process outcome in Physics of 480 secondary school pupils and found that the *main effect due to Approaches to Studying on Process Outcomes in Physics was not significant.*

Jones and Jones (1996) investigated the relationship of 46 college students' preferred teaching method and their own Approaches to Study (Surface, Deep and Achieving). Results indicated that *while students*

preferred the conventional lecture method, preference did not correlate with their study approach and neither method was found to be more effective.

Kember (1996) examined the interrelationship between workload, study time, Learning Approaches and Academic Outcomes. The sample consisted of 174 mechanical engineering students at a Hong Kong University. Findings indicated that *the variables were weakly interrelated.*

Rehna (1996) studied the interaction effect of Learning Style and Approaches to Studying on Achievement in Biology of 700 standard IX students. The results showed that *the effect of Learning Style on Achievement in Biology was significant. But none of the F-values in either dimensions of Approaches to Studying turned out to be significant.*

Provost and Bond (1997) administered a short version of the Approaches to Studying Inventory to 169 college Psychology students. Findings revealed that *scores for meaning orientation did not predict academic performance in any way, whereas there was a very small negative correlation between reproducing orientation and Academic Achievement.*

2.2.2.3. Summary of Studies Relating Approaches to Studying with Achievement

A summary of studies relating Approaches to Studying with Achievement is chronologically presented as follows. Studies showing positive relation with Achievement is followed by studies showing negative relation.

POSITIVE RELATION			
Sl. No.	Author	Year	Result
1.	Biggs	1979	Deep approach leads to superior performance
2.	Ramsden and Laurillard	1979	Variability in Approach leads to difference between individual academic tasks
3.	Watkins, <i>et al.</i>	1986	Approach related to academic success
4.	Entwistle and Waterston	1988	Elaborative processing related to deep approach
5.	Hattie and Watkins	1988	Positive relationship between Approaches to Studying and high quality learning outcomes
6.	Speth and Brown	1988	Deep approach linked to Elaborative Processing
7.	Harper and Kember	1989	Scoring high on Deep Approach factor show a Deep outcome
8.	Beina	1989	A significant positive correlation
9.	Uzhunnan	1989	Significant difference exist in science learning approach
10.	Duckwall	1990	Relationship between Approaches to Learning and academic success
11.	Watkins and Hattie	1990	Positive correlation between learning approach and academic success
12.	Majeedu	1990	Significant difference between Science knowledge and learning approach
13.	Boujaoude and Giuliano	1991	Meaning orientation accounted for 32% of the variance on the final score

contd.....

14.	Trigwell and Prosser	1990	Positive relationship between the variables
15.	Pillai and Naseema	1991	Significant and positive, but low relationship
16.	Ekins	1992	Deep motivation a key to success
17.	Wong	1992	Differences in Achievement between External students and Internal students
18.	Mayer and Dunne	1992	Contextual variables explain significantly more of the variations in study approach
19.	Schmeck and Geisler-Brenstein	1992	Showed interaction of perceptions and motivation
20.	Asmali	1992	Significant sex difference exist in science studying approach
21.	Anilkumar	1992	Significant main effect of science studying approach
22.	Jayaseelan	1992	Significant relationship between Approach and Achievement
23.	Horn	1993	Positive relation between Approaches and Achievement
24.	Kumar	1993	Significant main effect of Approaches to Studying on Achievement
25.	Areefa	1993	Significant difference between Girls and Boys in Approach
26.	Boujaoude and Giuliano	1994	Prior knowledge contributes Achievement
27.	Kumar	1994	Significant main effect of Approaches to Studying on Achievement

contd.....

28.	Pillai and Kumar	1994	Significant main effect of Approaches and Achievement
29.	Richardson	1995	Significantly higher scores on Meaning Orientation
30.	Kember	1995	Correlation between surface approach and greater study time
31.	Abouserie	1995	Influence of Achievement Motivation on Approaches to Studying
32.	John	1995	Significant difference between process outcome groups and Approaches to Studying
33.	Pillai	1995	Significant main effect on Achievement
34.	Bolen, <i>et al.</i>	1995	Deep approach was goal oriented
35.	Frontera and Horowitz	1995	Successful students tend to have superior organisation
36.	Richardson	1995	Basic orientations are distinctive.
37.	Pillai and Kumar	1996	A great effect on Achievement
38.	Fogarty and Taylor	1997	Learning orientations are fundamental
39.	Kumar	1997a	Significant difference between high and low achievers
40.	Kumar	1998	Significant main effect on Achievement
41.	Richardson, <i>et al.</i>	1999	Study approaches related to aims of higher education
42.	Pimparyon, <i>et al.</i>	2000	Diagnostic measurement tools to enhance learning outcomes

contd.....

NEGATIVE OR NO RELATION			
43.	Harper and Kember	1989	Students scored high on surface approach show negative outcome
44.	Lyn, <i>et al.</i>	1989	Changes toward less desirable learning approach.
45.	Naseema	1989	A low positive relationship
46.	Tooth, <i>et al.</i>	1992	Surface learning correlated with poor performance
47.	Prasad	1995	Main effect of Approaches to Studying not significant.
48.	Jones and Jones	1996	Preferences did not correlate with their study approach
49.	Kember	1996	Variables were weakly correlated
50.	Rehna	1996	No significant relation
51.	Provost and Bond	1997	Meaning orientation did not predict Achievement

2.2.3. STUDIES RELATING CLASSROOM CLIMATE WITH ACHIEVEMENT

The investigator made an elaborative attempt to survey the studies relating *Classroom Climate* with *Achievement*. Number of foreign studies could be located along with some Indian studies. These studies show how the different elements of Classroom Climate influence the students' Achievement. The investigator collected a total of *Fifty two* studies conducted during the period between *1980* and *2001*, of which *Forty one* reported positive relation with Achievement and *Eleven* revealed negative or no relation.

2.2.3.1. Studies Showing Positive Relation

The following studies show positive relationship between *Classroom Climate* and *Achievement*.

Kelly (1980) reports a study of association between student-perceived Classroom Environment and Student Achievement on a sample consisting of 41,057 students in 1735 schools in the 14 developed countries and found *Achievement was significantly and positively related to the level of classroom exploration.*

Hirunval (1980) in his study of Pupils' Self-Concept, Academic Motivation, Classroom Climate and Academic Performance found that *Classroom Climate has a positive relationship to Pupils performance and Classroom Climate in urban schools was better than in rural schools.*

Levin (1980) studied Classroom Climate as a criterion to evaluate individualised instruction in Israel. The sample was 57 first to third grade classrooms in 3 cities of Israel. Results indicated that *students in individualised classrooms perceived greater autonomy than students in traditional classrooms.*

Fraser and Northfield (1981) used a modified version of the Learning Environment Inventory in 17 seventh grade classes to monitor changes during the use of another AESP unit. It was found that after using the AESP unit, *students perceived their classes as more goal directed and individualised and less satisfying, difficult and competitive.*

Wright and Cowen (1982) conducted a study with a sample of 511 grades V and VI students and their 23 teachers in USA. It was found that

teacher perceived involvement, affiliation, rule clarity and order and organisation were related to more positive student mood and thereby greater achievement.

Upadhyaya (1984) in a study on Classroom Environment and its effects on learning found that teacher control signifying the strictness of teachers in implementing and enforcing rules and magnitude of punishment on violation of rules were positively correlated with Academic Achievement.

Doctor (1984) studied about the Classroom Climate, the psyche of pupils and their Achievement. 1279 pupils from all types of schools were selected for the study. It was found that a classroom with high Classroom Climate had high pupils psyche and classroom had consistency with Academic Achievement.

Christian (1984) conducted a study on group dynamics, academic motivation, Classroom Climate and Academic Performance among a sample of 293 higher secondary pupils. It was revealed that the pupils in urban classroom had shown higher mean scores on academic motivation as well as Classroom Climate, but an average scores on Academic Performance.

Fraser and O'Brien (1985) conducted a study for a sample of 758 grade 3 students in 32 classes. Association between Achievement measures and Classroom Environment dimensions were found to be quite strong when the class means was used as the unit of statistical analysis.

Fraser (1986) conducted another study using the Individual Classroom Environment Questionnaire (ICEQ) aimed at promoting

individualised learning approaches in high school. It was reported that *students in the school, implementing the innovations perceived their classes as significantly more individualised.*

Yadav (1987) studied the Classroom behaviour of high school Biology teachers and pupils Achievement in Science on high school teachers of Eastern U.P. The results revealed that *there was significant difference between classroom behaviour patterns of effective and non-effective Biology teachers at high school level.*

Wilkinson (1988) in a study of teacher-student interaction displayed in a secondary Physics class suggested *student-centred instructional strategies create an environment that enhances self-esteem, responsibility, behaviour and academic performance.*

Basheer (1989) tried to find out the relationship between Science Learning Environment and Achievement in Chemistry of 600 standard IX students. Results revealed that *there was significant differences in Science Learning Environment between high, average and low creative group.*

Ramsden, et al. (1989) examined the School Environment and sixth form pupils approaches to learning. A key finding was that *perceived School Environment and pupils learning are related in systematic way.* School Environment offering supportive teaching coherent structure, emphasize on autonomy and moderate state on Achievement are associated with learning.

Ellet and Logan (1990) examined the relationships among teachers' perceptions of school organisational coupling structures, school

environmental robustness and school effectiveness measures. Data collected from 1,843 students of 73 schools. Results indicated a *considerable variation across schools in the degree of coupling, a generally positive perception among teachers regarding school organisational robustness and a lack of association between "tight coupling" and school effectiveness.*

Mac Aulay (1990) examined the class size and student Achievement with special reference to elementary settings. The findings revealed that *achievement of a match between students preferences and instructional settings is a necessary condition for maximising their cognitive social and affective outcomes.*

Mercincavage, et al. (1990) conducted a study on differences in Achievement Motivation of college students and classroom seating position. The sample for study was 58 college freshmen declared as they sat in rows farther from the front of room. The results revealed that *the scores were stable for the upper class students.*

Short and Short (1991) investigated the relationship between classroom social climate and task behaviour of students. Results showed that *social climate variables were significantly related to classroom on task behaviour.*

Garcia (1992) examined the attitudes of fifth and sixth grade students toward Classroom Climate. A Classroom Climate Checklist was administered to 185 students in Chicago. The findings indicated *most of the items related to teachers and students rated as strong positive aspects of Classroom Climate.*

Padhi (1992) examined the relationship between the Psycho-Social characteristics of Classroom Environment, Creative ability, Academic self concept and Academic Achievement. The subjects were secondary school pupils and found *a significant and positive relation*.

Deng and Bing (1992) studied the effects of Classroom Climate on Achievement in Mathematics of fourth grade students. 875 samples from 42 classes in 13 Public schools were selected for the study. It was found that *higher and more equitable distribution of Achievement exists in classes with higher levels of academic emphasis and student satisfaction as well as in classes with low levels of tension*.

Payne (1992) examined the effects of motivation and classroom Learning Environment on Mathematics scores of 300 black high school students. It was found that *the classroom learning variable order and organisation had a significant positive effect on Mathematics scores, but no other classroom variable had significant effects*.

McRobbie and Fraser (1993) investigated the associations between student outcomes and classroom environment for high school chemistry students. The results indicated that the *nature of the classroom environment accounted for appreciable proportions of variance in both cognitive and affective outcomes beyond those attributable to general ability*.

Nunnery (1993) examined the effects of Classroom Climate on language achievement at the elementary level. A Classroom Climate scale was administered to 942 students of 22 schools. *Significant relationships were found among climate measures and student Achievement*.

Reymond and Jeffrey (1993) made a character analysis of high school science Classroom Environments and Attitude towards Science. Results suggested that *perception of their Classroom Environment affect the Attitude and Achievement of students.*

Beenakumari (1993) conducted a comparative study of Classroom Climate of secondary schools of different managements. Findings disclosed that *Classroom Climate is positively associated with personality factors which inturn is related to Academic Achievement.*

Pierce (1994) reported a case study that examined how one effective middle school teacher of primarily high-risk students created a classroom environment that enhanced learner outcomes. Analysis of data collected through participant observation and interview indicated that the *normative nature of the particular classroom was intimately entwined with academic learning.*

Yuen-Yee (1994) examined Classroom Environment and approaches to learning. It was to investigate about the actual and preferred perceptions of Hong Kong secondary school pupils. Results showed that *students perceived their classroom to be fairly competitive.*

Prebha (1994) investigated the Achievement in basic concepts in Biological science in relation to Classroom Climate of 520 secondary school seventh class students. Results reported *significant differences in Achievement between pupils with good Classroom Climate and pupils with moderately good Classroom Climate.*

Goh and Fraser (1995) examined the nature and impact of Classroom Climate on Achievement in Mathematics of 1,512 elementary students in Singapore. Findings revealed the *consistent associations between classroom environment and student outcomes*.

Henderson (1995) investigated Biology students' perceptions of the classroom and the laboratory Learning Environments. The outcomes reported in the study indicate that *certain aspects of the learning environment are associated with students' Achievement outcomes*.

Martin (1996) examined the teacher's role in creating a gender-sensitive environment in an all girls physics class and the effects of that environment on girls' Achievement. The findings indicated that the *recognition of the girls' needs and teacher knowledge of intervention strategies to address the need, fulfil the expectations of the girls and the teacher and create the environment necessary for continued growth and learning*.

Narayanan (1996) studied about the Classroom Climate and Attitude towards science on Achievement in Biology of standard IX pupils of Kerala. 600 samples were selected for the study. It was found that *the main effect of Classroom Climate on Achievement in Biology was significant for the total sample as well as subsamples*.

Jyothi (1996) investigated the influence of attitude towards Physics and Classroom Climate on Achievement in Physics. The results revealed that there exist a *significant relationship between attitude towards Achievement in physics and Classroom Climate*.

Meece and Mc Colskey (1997) conducted research on student motivation in classroom and school settings. Results suggested *an overall framework for a classroom environment that results in student engagement and interest.*

Sunitha (1997) examined the influence of Classroom Climate and attitude towards Mathematics on Achievement in Mathematics. Results revealed that a *significant relationship existed between them.*

Kalyanidevi (1997) conducted a study on Home and School Environment and their influence on perceptual style. The samples of the study consisted of 240 high school students of Thirupathi town. One of the key findings of the study revealed that *the Home and School Environment are responsible for perceptual abilities in children.*

Sasidharan (1997) studied the influence of instructional learning strategies and Classroom Environment on Achievement in Malayalam language on 110 standard VII pupils. The findings revealed that *the classroom environment has significant main effect on Achievement in Malayalam language.*

Hudley (1998) compared perceptions of classroom environment for African-American male students and similar students enrolled in the general education programme (N = 92). Results reported that the *strong positive relationships among affiliation, teacher support, classroom order and task orientation are consistent with African-American students.*

Bhargavi (1999) explored the relationship between Learning Style and Classroom Climate. The sample consisted of 700 pupils of standard IX.

Findings reported *a positive correlation between Classroom Climate and Learning Style.*

Bowman and Potts (2001) designed a programme to improve and enhance students' social skills in and out of the classroom. The targetted population consisted of two fourth grade classrooms at two different suburban cities. Analysing the causes revealed that students are being influenced by a variety of changes: breakdown in the family, no social skill implementation in the curriculum, low self-esteem and achievement and insufficient support from parents and teachers to teach social skills. *The interventions used had a positive influence on the behaviours of the targeted students.*

2.2.3.2. Studies Showing Negative Relation

The following studies reported negative relationship between *Classroom Climate and Achievement.*

Talton (1983) investigated the influence of classroom on Attitude towards science and Achievement in Science. The sample students taught by 23 different teachers in North Carolina and measured their Classroom Environment and it found *strongly related to Attitude but relatively weakly associated with Achievement.*

Lalithakumari (1984) studied Classroom Climate, Pupils' psyche and Teacher Behaviour in innovative classrooms in Karnataka. The study was on 14 Classrooms in both urban and rural areas on sample size of 602 students and 56 teachers. The results revealed that *the classroom trust and pupil motivation are high in low innovative classrooms and low in high innovative classrooms.*

Prasad (1988) investigated the Classroom Environment for learning Science in the secondary schools in Kerala. The sample was 700 standard IX and X students. Analysis of the data reported *no significant difference in Achievement*.

Pandya (1991) studied the *Classroom Climate* of schools which fall under different types of management. The results indicated that *dimensions of Classroom Climate do not differ significantly in aided, unaided and central schools*.

Jack and Lizi (1993) made a quantitative study of social education of Classroom Environment. The sample for study includes 38 eighth to tenth grade classrooms of Gangdong province. The results of the study suggested that *no significant relationship existed between students' perception of their Classroom Environment*.

Townsend and Hicks (1995) investigated the relationship between Form Two students (N=162) academic task values in two school subjects. The interaction of gender and classroom goal structure suggested that *boys are less affected by the nature of the classroom climate*.

Kumar (1995) studied the effect of cognitive style and Classroom Environment on Achievement in Social Science of standard IX pupils. 500 samples were selected for the study. It was found that *Classroom Environment has no significant main effect on Achievement*.

Panikker (1996) examined the influence of attitude towards homework and Classroom Climate on Achievement in Biology. 600 samples were taken for the study. The result obtained revealed that there is

significant negative relationship between girls and pupils in government schools and between the variables classroom climate and Achievement in Biology.

Suresan (1997) examined the effect of cognitive style and Classroom Environment on Achievement in Biology. Samples for the study were drawn from secondary school pupils. Analysis of the data revealed that *Classroom Environment has a negative effect on Achievement in Biology.*

Dunn and Harris (1998) examined selected factors associated with Classroom climate like satisfaction, friction, competition, difficulty cohesiveness and their relationships with academic Achievement. Findings revealed that *climate plays a relatively minor role in influencing Achievement.*

Lee, et al. (1999) investigated the effects of the use of co-operative learning on social studies achievement and Classroom Climate in Singapore students. Results indicated that *there was no significant differences between experimental and control classes in Classroom Climate.*

2.2.3.3. Summary of Studies Relating Classroom Climate with Achievement

A summary of studies relating Classroom Climate with Achievement is presented year wise as follows. Studies showing positive relation are followed by studies showing negative or no relation with Achievement.

POSITIVE RELATION			
Sl. No.	Author	Year	Result
1.	Kelly	1980	Achievement significantly and positively related
2.	Hirunval	1980	Positive relationship with pupils performance
3.	Levin	1980	Perceived greater autonomy in individualised Classrooms
4.	Fraser and Northfield	1981	Perceived more goal directed and individualised activity
5.	Wright and Cowen	1982	More positive student mood and greater achievement
6.	Upadhyaya	1984	Enforcing rules positively correlated with Achievement
7.	Doctor	1984	High Classroom Climate had consistency with Achievement
8.	Christian	1984	Higher mean score on academic motivation
9.	Fraser and O'Brien	1985	Classroom Environment dimensions were found to be strong.
10.	Fraser	1986	Perceived classes as significantly more individualised
11.	Yadav	1987	Significant difference between Classroom behaviour patterns
12.	Wilkinson	1988	Enhanced academic performance

contd.....

13.	Basheer	1989	School environment and pupils learning related
14.	Ramsden, <i>et al.</i>	1989	School environment and pupils learning are significantly related.
15.	Ellet and Logan	1990	Positive perception among teachers
16.	Mac Aulay	1990	A match between students preferences and instructional preferences necessary
17.	Mercincavage, <i>et al.</i>	1990	Stable scores for upper class students
18.	Short and Short	1991	Social climate variables significantly related
19.	Gracia	1992	Rated as strong positive aspects of Classroom Climate
20.	Padhi	1992	Found a significant and positive correlation
21.	Deng and Bing	1992	Higher and more equitable distribution of Achievement exists
22.	Payne	1992	Significant positive effects on Mathematics scores
23.	McRobbie and Fraser	1993	Classroom environment accounted for appreciable proportions of variance
24.	Nunnery	1993	Significant relationship with Achievement
25.	Reymond and Jeffrey	1993	Classroom environment affected the Attitude and Achievement
26.	Beenakumari	1993	Positively associated with Achievement

contd.....

27.	Pierce	1994	Intimately entwined with academic learning
28.	Yuen-Yee	1994	Perceived classroom fairly competitive.
29.	Prebha	1994	Significant difference in Achievement
30.	Goh and Fraser	1995	Consistent associations between Environment and student outcome
31.	Henderson	1995	Associated with students' Achievement outcomes
32.	Martin	1996	Create the environment necessary for continued growth and learning
33.	Narayanan	1996	Significant main effect on Achievement in Biology
34.	Jyothi	1996	Significant relationship with attitude towards Achievement
35.	Meece and Mc Colskey	1997	Suggested environment that results in student engagement and interest
36.	Sunitha	1997	Significant relationship with Achievement in Mathematics
37.	Kalyanidevi	1997	Home and school environment influences perceptual abilities
38.	Sasidharan	1997	Significant main effect on Achievement in Malayalam
39.	Hudley	1998	Strong positive relationships
40.	Bhargavi	1999	A positive correlation between Classroom Climate and Learning Style
41.	Bowman and Potts	2001	Positive influence on the behaviours of the targetted students.

contd.....

NEGATIVE OR NO RELATION			
42.	Talton	1983	Weakly associated with Achievement
43.	Lalithakumari	1984	Classroom trust and motivation low in high innovative classrooms
44.	Prasad	1988	No significant difference in Achievement
45.	Pandya	1991	Classroom Climate do not differ significantly.
46.	Jack and Lizi	1993	No significant relationships existed
47.	Townsend and Hicks	1995	Boys are less affected by the nature of Classroom Climate
48.	Kumar	1995	No significant main effect on Achievement
49.	Panikker	1996	Significant negative relationship with Achievement
50.	Suresan	1997	A negative effect on Achievement in Biology
51.	Dunn and Harris	1998	Minor role in influencing Achievement
52.	Lee, <i>et al.</i>	1999	No significant difference between experimental and control classes

2.2.4. META ANALYSIS

In this part of the chapter the reviewed studies on Learning Style, Approaches to Studying and Classroom Climate on Achievement has been subjected to *Meta analysis*. This is done with a view to get a clear picture

about the underlying *trend* of the Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate in relation with Achievement. For this purpose the percentage of positive and negative studies on the variables were calculated and presented in Table 2.1 as follows.

TABLE 2.1
Details of Meta Analysis

Variable	Total No. of Studies	No. of Positive Studies	Percentage of Positive Studies	No. of Negative Studies	Percentage of Negative Studies
Learning Style	78	53	68	25	32
Approaches to Studying	51	42	82	9	18
Classroom Climate	52	41	79	11	21

The comprehensive survey of related literature and meta analysis conducted by the investigator revealed the following aspects.

The investigator reviewed a variety of studies relating Learning Style, Approaches to Studying and Classroom Climate with Achievement conducted during the period from 1979 to 2002. Even though most of the studies were conducted by foreign researchers, a limited number of Indian studies were also located. While majority of studies revealed a positive association with Achievement, some other studies highlighted negative or no relationship.

As per Table 2.1 which gives the details of meta analysis conducted by the investigator, in the Independent Variable, Learning Style *seventy*

eight studies were reviewed. *Fifty three studies* of which (68%) revealed *positive* relation with Achievement and the remaining *twenty five* studies (32%) showed *negative or no* relation.

In Approaches to Studying out of *fifty one studies* reviewed in *forty two* (82%) reported positive association with Achievement and *nine* (18%) highlighted *negative or no* association. In Classroom Climate *forty one* studies (79%) out of *fifty two* studies reviewed revealed *positive* relation with Achievement and *eleven* studies (21%) reported negative or no relation.

Results of meta analysis revealed that, though the studies showing positive relation with Achievement outnumbered the studies showing negative or no relation, the latter is not negligible. Hence the association of Learning Style, Approaches to Studying and Classroom Climate with Achievement is *inconsistent* and *inconclusive*. It is in this context that the investigator prepared to undertake a study of this kind. In the extensive survey of related literature not even a single study showing the interaction effect of these variables on Scholastic Achievement was located. This fact highlights the relevance of the present study.

Chapter 3

M E T H O D O L O G Y

-
- ❖ *Variables*
 - ❖ *Objectives*
 - ❖ *Hypotheses*
 - ❖ *Procedure*
 - ❖ *Tools Used for the Collection of Data*
 - ❖ *Sample for the Study*
 - ❖ *Mode of Data Collection, Scoring, Consolidation of Data*
 - ❖ *Statistical Techniques Used for Analysis of Data*
 - ❖ *Summary of Procedure*
-

CHAPTER 3

METHODOLOGY

This chapter explains the *ways* and *means* adopted to carry out the present study. Considering the current problems in education, the present study is intended to examine the main and interaction effects of *Learning Style, Approaches to Studying* and *Classroom Climate on Achievement in Social Sciences* of Secondary School Pupils.

The methodology adopted for the study is presented in this chapter under the following order.

3.1 VARIABLES

3.2 OBJECTIVES

3.3 HYPOTHESES

3.4 PROCEDURE

3.1. VARIABLES

The present study is intended to determine how much of variation in *Achievement in Social Sciences* (Objective wise and Total score) of secondary school pupils be attributable to the variation in their *Learning Style, Approaches to Studying* and *Classroom Climate*.

The selection of variables for the present investigation was on the basis of the following rationale.

3.1.1. Selection of Variables

Firstly, the investigator identified and scrutinised variables that are related to *school performance* and achievement by a comprehensive review of literature. Further wide spectrum of research conducted in the area domestically and abroad was reviewed. The selection of any variable as an Independent Variable was based on the assumption that the variable might be related to *Student performance* and *achievement*, and could be used as a probable predictor of achievement. Such variables are classified and presented as follows.

3.1.1.1. Cognitive Variables

Intelligence and spatial abilities like numerical ability, spatial ability, critical thinking, verbal reasoning, retentive memory, comprehension and interpretation and cognitive style are included under cognitive domain. There are research evidences that reflect the relationship between these variables and achievement.

3.1.1.2. Personality Variables

Non-cognitive variables including personality and affective variables such as attitude, interest, achievement motivation, adjustment, anxiety, neuroticism, *extroversion* and *intraversion* and the like come under this category. There are research findings showing connection between these variables and Achievement.

3.1.1.3. Types of school programme

This includes such variables as method of teaching, instructional effectiveness, evaluation procedures, classroom climate, use of audio-visual materials and text books, individual attention given to students, availability of supplementary reading materials, size of the class, co-curricular activities, influence of teachers, sex of the teachers etc. There are number of studies that revealed the association between achievement and these variables.

3.1.1.4. Social and Familial Environment

This includes parental education, profession and income, previous educational and social experience, locale, facilities available at home, family integration, rejection, family acceptance, autocracy-democracy within the family, mutual trust and approval by the family members and dependence - independence

3.1.1.5. Study Techniques

Variables such as study habits, Approaches to learning, Learning style, learning strategies etc. are included in this category. The empirical works reported from these areas are not very high.

3.1.2. Criteria Used for Selection of the Variables

Identification of a wide array of factors that affecting *student performance* in Achievement in Social Sciences directed the investigator to make a cautious selection of variables for the present study. The selection of the variables were made on the following major consideration.

1. The variables selected should come under the *study technique* and the *school programme* categories.
2. High degree of *influence* should be shown by the selected factors with Achievement in Social Sciences.
3. The factors selected should be amenable for *objective measurement* and also facilitate group measurement.
4. For the variables selected standardised tests should as far as possible be *available* or that could be developed within a reasonable period of time.

Considering the above criteria the independent variables selected are presented as follows.

3.1.2.1. Independent Variables

The Independent Variables selected for the study were

1. *Learning Style* (Four components viz., Environmental, Emotional, Sociological, Physical and Total score).
2. *Approaches to Studying* (Four components viz., Meaning Orientation, Reproducing Orientation, Achieving Orientation, Non-Academic Orientation and Total score) and
3. *Classroom Climate* (Total score only).

3.1.2.2. Dependent Variables

The Dependent Variables selected for the study were *Achievement in Social Sciences* (Six Objective wise scores viz., Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation and Total score).

3.2. OBJECTIVES

Following are the objectives formulated for the study.

- 3.2.1. To study *whether there exists* any sex difference in Learning Style (Componentwise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.2.2. To study *whether there exists* any sex difference in Approaches to Studying (Componentwise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.2.3. To study *whether there exists* any sex difference in Classroom Climate (Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.2.4. To study *whether there exists* any sex difference in Achievement in Social Sciences (Objective wise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.2.5. To study the *main* and *interaction* effects of the three Independent variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Total sample.

- 3.2.6. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Boys.
- 3.2.7. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Girls.
- 3.2.8. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Rural sample.
- 3.2.9. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Urban sample.
- 3.2.10. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Government sample.
- 3.2.11. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Private sample.
- 3.2.12. To find out the *best predictor* of Achievement in Social Sciences from the set of three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate.

3.3. HYPOTHESES

The following hypotheses were framed and tested for the present study.

- 3.3.1. There will be *significant* sex difference in Learning Style (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.3.2. There will be *significant* sex difference in Approaches to Studying (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.3.3. There will be *significant* sex difference in Classroom Climate (Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.3.4. There will be *significant* sex difference in Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for the Total sample and Subsamples based on Locale and Type of management of school.
- 3.3.5. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for the Total sample.
- 3.3.6. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Boys.

- 3.3.7. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Girls.
- 3.3.8. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Rural sample.
- 3.3.9. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Urban sample.
- 3.3.10. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Government sample.
- 3.3.11. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Private sample.
- 3.3.12. Achievement in Social Sciences can be *predicted* using the set of three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate.

3.4. PROCEDURE

The procedure adopted for the study is described as follows.

3.4.1 TOOLS USED FOR THE COLLECTION OF DATA

In order to collect the data needed for the study, the following four standardised tools were required. Of which two were constructed and standardised by the investigator.

- 3.4.1.1 LEARNING STYLE INVENTORY (LSI - Kumar, *et. al.*, 1996)
- 3.4.1.2 APPROACHES TO STUDYING INVENTORY (ASI - Kumar & Das, 2001)
- 3.4.1.3 SCALE OF CLASSROOM CLIMATE (SCC - Usha & Sunitha, 1997)
- 3.4.1.4 ACHIEVEMENT TEST IN SOCIAL SCIENCES (ATSS - Kumar & Das, 2001).

A brief description of the tools is given in the following:

3.4.1.1 LEARNING STYLE INVENTORY (LSI)

In order to measure the Learning Style of secondary school pupils, the Learning Style Inventory (LSI) developed and standardised by Kumar, *et al.* (1996) was used. This LSI is based on the theoretical formulation of Dunn and Dunn model of Learning Style (Dunn, *et al.*, 1989) which depicts Learning Style as multidimensional rather than bipolar (Harvey, 1994) constructs.

The LSI has four style areas – *Environmental, Emotional, Sociological* and *Physical*. Each major dimension has sub-divisions of different style elements. Table 3.1 shows the details of the major style areas and style elements. These are learner preferences to the major four dimensions and the components during the process of learning a given academic task.

TABLE 3.1
Style Areas and Style Elements of Learning Style Inventory

Style Area	Style element	Preference for
Environmental	1. Noise Level	1. Sound vs. quiet
	2. Light	2. Bright vs. dim light
	3. Temperature	3. Warm vs. cool environment
	4. Design	4. Informal (sofa, floor) vs. formal (table, chair) seating arrangement
Emotional	5. Motivation	5. Desire to achieve
	6. Persistence	6. Engaging in a task until complete or 'take breaks'.
	7. Responsibility	7. Conforming to expectations
	8. Structure	8. Specific directions vs. latitude
Sociological	9. Peers	9. Learning alone vs. with others (pairs, groups)
	10. Authority	10. Directions from 'expert'
	11. Several Ways	11. Variety of methodologies and/or ability to cope with same
Physical	12. Auditory	12. Learning by listening/ hearing
	13. Visual	13. Learning by watching/ reading
	14. Tactile	14. Learning by hands-on e.g. note taking
	15. Kinesthetic	15. Learning by active involvement e.g. direct experience
	16. Intake	16. Eating, drinking to help concentration
	17. Evening/Morning	17. Learning in the evening vs. morning
	18. Late Morning	18. Learning in the late morning
	19. Afternoon	19. Learning in the afternoon
	20. Mobility	20. 'Taking breaks' vs. able to sit still for long periods

The LSI has 45 items of which 31 are positive and 14 are negative. Out of four style areas the Environmental style area has 11 items, (1 to 11). Emotional 12 (12 to 23), Sociological eight (24 to 31) and physical 14 (32 to 45) items.

The LSI was prepared in Malayalam language which can be attempted within 25 minutes. Responses have to be marked on a three point scale with alternatives as *Always*, *Sometimes* and *Never*. In the case of positive items a score of *two*, *one* and *zero* are given to the response categories *Always*, *Sometimes* and *Never* respectively. The scheme of scoring was reversed for the negative items as *zero*, *one* and *two* for the responses *Always*, *Sometimes* and *Never*. The LSI has a maximum score of 90 and minimum score of zero.

Some of the illustrative items are given as follows:

a. Style area : Environmental

Style element : Noise level

I am not disturbed by any sound in utmost concentration.

Always	Sometimes	Never
--------	-----------	-------

b. Style area : Emotional

Style element : Structure

Often I succeed in rising upto the expectations of my parents regarding my studies.

Always	Sometimes	Never
--------	-----------	-------

c. Style area : Sociological

Style element : Authority

I like to study in a way which is different from that of my peers.

Always	Sometimes	Never
--------	-----------	-------

d. Style area : Physical

Style element : Mobility

The short recesses during the study time boost up my enthusiasm to learn.

Always	Sometimes	Never
--------	-----------	-------

The criterion validity and test-retest reliability of LSI as reported by the test constructors were 0.62 and 0.64 respectively. The internal consistency of the scale was examined and the intercorrelation matrix of Learning Style components with Learning Style total score are presented in the following.

Correlations	Environ- mental	Emotional	Sociological	Physical	TOTAL
Environmental		0.139	0.088	0.155	0.557**
Emotional			0.143	0.217	0.607**
Sociological				0.144	0.487**
Physical					0.726**

** P < 0.01.

The Learning Style Inventory, the Response Sheet, the corresponding English version and the response sheet of English version are presented in Appendices I, IA , IB and IC.

3.4.1.2. APPROACHES TO STUDYING INVENTORY (ASI)

The ASI was used to measure the Approaches to Studying of secondary school pupils. It was constructed and standardised by the investigator. The following steps were adopted in the construction and standardisation of the Inventory.

Planning

The investigator studied thoroughly the literature on Psychology of learning process to get a theoretical footing for the Inventory. Special attention was given to those kinds of literature dealing the process of learning in pupil's own perspective, because pupils have personal conceptions and motives about how their learning might be. To get an insight about this aspect, special emphasis was given to the work done by *Watts (1810), Dewey (1910), Marton and Saljo (1976), Fransson (1977), Svensson (1977), Entwistle (1979), Biggs (1979), Entwistle (1981), Entwistle (1987) and Biggs (1990)*.

The investigator searched for an appropriate inventory to measure the Approaches to Studying of the sample selected. Though such inventories were available, but were constructed and standardised in the foreign context. An ASI which was prepared in Indian context was also found available. But it has a limitation of being subject specific. Thus the investigator decided to construct a general Approaches to Studying Inventory which is *culture free* and standardised in Indian context.

The investigator reviewed a vast amount of literature and inventories relating to the Learning Style, Study Processes, Approaches to Studying etc. Previous factor analyses of the Approaches to Studying Inventories (Schmeck,

et al., 1977, Entwistle, *et al.*, 1979; Entwistle and Ramsden, 1983; Biggs, 1987; Pillai, *et al.*, 1992) were thoroughly reviewed and studied before preparing the new ASI.

This ASI was prepared in tune with the Approaches to Studying Inventory (Entwistle & Ramsden, 1983) which was a product of research on student learning. It included *motivations* and *study methods* as well as contrasting *intention to understand* with the *intention to reproduce* the information being processed. This inventory also attempted to measure differences in style or kind of learning, as described by Pask (1976) who identified two strategies: *comprehension learning* and *operation learning*; and two pathologies; *improvidence* and *globetrotting* (Pask, 1976). It also included the ideas of *syllabus-boundness* described by Hudson (1968) and strategic approach based on responding to contextual cues on what study behaviours are most rewarded by assessment system (Entwistle, *et al.*, 1979).

Preparation

The draft form of ASI developed comprised of four component scales with four sub scales each. The details of scales and subscales that constitute the ASI are given in Table 3.2.

TABLE 3.2

Scales and Subscales of Approaches to Studying Inventory

Scales	Subscales
Meaning Orientation	Deep approach Inter relating ideas Use of evidence Intrinsic motivation
Reproducing Orientation	Surface approach Syllabus-boundness Fear of failure Extrinsic motivation
Achieving Orientation	Strategic approach Disorganised study method Negative attitude to studying Achievement motivation
Non Academic Orientation	Comprehension learning Operation learning Globetrotting Improvidence

As per Table 3.2 the four component scales and their sub scales are the following.

1. **Meaning Orientation:** It involves an intention to understand and give meaning and focussing on relations between parts of subject matter, the author's message in association with the evidence used to support it. The subscales of Meaning Orientation are:

- a. **Deep Approach:-** In deep approach the learner involves in active questioning while learning.

- b. *Inter relating ideas:-*** Here the learner is trying to relate the content matter with other parts of the course.
 - c. *Use of evidence:-*** The learner uses evidence while concluding a learning material.
 - d. *Intrinsic Motivation:-*** Here the learner is involved in active learning for learner's own sake.
- 2. *Reproducing Orientation:*** It involves minimalist engagement with the task, focussing on memorising or applying procedures unreflectively. The learner sees school learning as a mean towards some other end, such as obtaining a better job or just keeping out of trouble. The strategy is thus limited to the target of essentials and reproducing through rote learning. Its subscales are –
 - (a) *Surface approach:-*** The learner is preoccupied with memorisation for reproducing it when the need arises.
 - (b) *Syllabus boundness:-*** The learning process is centred around the syllabus and the learner is relying on staff to define the learning tasks.
 - (c) *Fear of failure:-*** The learner shows pessimism and anxiety about academic outcomes and the learning is guided by the goal of avoiding a failure.
 - (d) *Extrinsic motivation:-*** The student is interested in courses and studies for the qualifications and benefits they offer.

3. **Achieving Orientation:-** This is related to the competitive form of motivation called need for achievement (n'ach) or hope for success. Its related strategies are organising time, working space and syllabus coverage in most efficient way. Its subscales are:-

- (a) **Strategic approach:-** In this subscale learners are aware of implications of academic demands made by staff.
- (b) **Disorganised study method:-** In this learning strategy learners are unable to work regularly and effectively.
- (c) **Negative attitude to studying:-** Pupils show a negative attitude to studying by lack of interest in content matter and in the application.
- (d) **Achievement Motivation:-** Learners are showing confidence and highly competitive.

4. **Non Academic Orientation:-** It involves broad strategies of Learning with logical sequences and overreliance on details. The techniques adopted for learning are ineffective and weak to achieve higher level of understanding. Its subscales are:-

- (a) **Comprehension learning:-** The learners are ready to map out subject area and think divergently.
- (b) **Operation learning:-** While learning the learners emphasize on facts and logical analysis.
- (c) **Globetrotting:-** The learners show a tendency to jump into conclusion without adequate factual basis.

- (d) **Improvvidence:-** It is a learning pathology characterised by overreliance on details and failure to develop overall understanding.

The investigator initially pooled 112 items falling equally in to the respective Approaches to Studying component Scales and Subscales. Each subscale consisted of seven items. Utmost care was taken to make the items *clear, precise* and *comprehensive* to the construct measured. Items were prepared by abiding to the rules of Attitude Scale Construction (Edwards, 1969). Four items from each subscale were selected and subjected to expert judgement. Based on the advice, some items were deleted and others modified. The draft form of ASI then comprised of 64 items.

The items required the pupils to respond on a three point scale as *Always, Sometimes* and *Never*. For a positive item in the inventory a score of *two* were given to the response category - *Always*, *one* to the category - *Sometimes* and *zero* to the category - *Never*. Scoring scheme was reversed for the negative items. All items were presented in Malayalam with a maximum score of 128 and a minimum score of zero.

Try out

The draft inventory with 64 items was administered on a sample of 400 secondary school pupils who were randomly selected. Adequate weightage was given to each strata of sample like Sex, Locale and Type of Management of the schools. As per the instructions in the draft ASI the pupils were required to respond on a three point scale as *Always, Sometimes* and *Never*. For a positive item in the inventory a score of *two* was given to the response *Always*, *one* to the response *sometimes* and *zero* to the response *Never*.

For negative items the scoring scheme was reversed. All the items were presented in Malayalam with a maximum score of 128 and a minimum score of zero. The time required for the completion of all the items was found to be 35 minutes. The Draft form of **ASI**, the Response Sheet, English version of draft ASI and the response sheet of English version are presented in Appendices II, IIA, IIB and IIC respectively.

Item Analysis

For item analysis 400 response sheets which are completed in all respects were selected. When the incomplete response sheets were rejected the number for item analysis reduced to 380. The item analysis was carried out using the method suggested by *Edwards* (1969). In order to facilitate computational procedures 370 sheets out of 380 were randomly drawn and arranged in the descending order of scores. The upper 100 sheets (27%) and lower 100 sheets (27%) were treated as high and low groups respectively.

Under each group, for each item, the number of pupils making response to *Always*, *Sometimes* and *Never* were found out and presented in the form of a frequency table. Then the *t* value for each item was calculated to find out the discriminating power. The *t* value showed the extent to which the high group and the low group are differentiated on a given item in the inventory.

The following formula was used to calculate the *t* value.

$$t = \frac{\bar{X}_H - \bar{X}_L}{\frac{\sqrt{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}}{n(n-1)}}$$

where

$$\sum (X_H - \bar{X}_H)^2 = \sum X_H^2 - \frac{(\sum X_H)^2}{n}$$

$$\text{and } \sum (X_L - \bar{X}_L)^2 = \sum X_L^2 - \frac{(\sum X_L)^2}{n}$$

$\bar{X}_H$ = The mean score on a given item for the high group

$\bar{X}_L$ = The mean score on the same item for the low group.

X_H = Score of high group

X_L = Score of low group

n = number of cases

Those items exceeding a t value of 1.88 were selected for the final inventory. The t values of items and the items selected are given in Table 3.3.

TABLE 3.3
Details of item Analysis of Approaches to Studying Inventory

Item Number	Scales	Sub scales	Positive/ Negative	t-value	Items Selected/ Rejected
1.	Meaning Orientation	Deep Approach	Positive	1.41	Rejected
2.			Negative	3.90	Rejected
3.			Positive	4.49	Selected
4.			Negative	8.05	Selected
5.		Interrelating Ideas	Negative	3.58	Selected
6.			Positive	4.77	Rejected
7.			Positive	7.01	Selected
8.			Negative	2.73	Rejected
9.		Use of Evidence	Positive	3.52	Rejected
10.			Negative	3.06	Rejected
11.			Positive	4.33	Selected
12.			Negative	3.55	Selected
13.		Intrinsic Motivation	Positive	2.42	Rejected
14.			Negative	1.26	Rejected
15.			Positive	3.90	Selected
16.			Negative	3.14	Selected

contd.....

Item Number	Scales	Sub scales	Positive/ Negative	t-value	Items Selected/ Rejected
17.	Reproducing Orientation	Surface Approach	Positive	3.91	Selected
18.			Negative	3.42	Selected
19.			Positive	1.26	Rejected
20.			Negative	1.00	Rejected
21.		Syllabus Boundness	Negative	4.39	Selected
22.			Positive	7.01	Selected
23.			Positive	5.27	Rejected
24.			Negative	0.18	Rejected
25.		Fear of failure	Positive	0.00	Rejected
26.			Negative	5.11	Selected
27.			Positive	5.05	Rejected
28.			Negative	5.84	Selected
29.		Extrinsic Motivation	Positive	2.57	Selected
30.			Negative	4.51	Rejected
31.			Positive	1.87	Rejected
32.			Negative	5.9	Selected
33.	Achieving Orientation	Strategic Motivation	Negative	0.66	Rejected
34.			Positive	5.38	Selected
35.			Negative	1.08	Rejected
36.			Positive	1.88	Selected
37.		Disorganised Study method	Negative	7.15	Selected
38.			Negative	6.12	Rejected
39.			Positive	2.71	Selected
40.			Positive	0.90	Rejected
41.		Negative Attitude to studying	Negative	4.41	Selected
42.			Positive	7.62	Selected
43.			Positive	2.31	Rejected
44.			Negative	3.60	Rejected
45.		Achievement Motivation	Negative	1.88	Selected
46.			Positive	1.91	Rejected
47.			Negative	1.82	Rejected
48.			Positive	3.39	Selected
49.	Non Academic Orientation	Comprehension Learning	Positive	5.98	Selected
50.			Negative	1.31	Rejected
51.			Positive	5.91	Rejected
52.			Negative	3.05	Selected
53.		Operation Learning	Positive	6.74	Rejected
54.			Positive	7.81	Selected
55.			Negative	2.41	Rejected
56.			Negative	2.56	Selected
57.		Globetrotting	Negative	0.00	Rejected
58.			Positive	6.60	Selected
59.			Negative	0.99	Rejected
60.			Positive	6.32	Selected
61.		Improvvidence	Positive	4.30	Selected
62.			Negative	4.29	Selected
63.			Positive	0.99	Rejected
64.			Negative	1.28	Rejected

The Final Approaches to Studying Inventory was thus comprised of 32 items of which 17 are positive and 15 are negative. Each scale contained *eight* items, with *two* items each from each sub scale. The time required to respond to the ASI was fixed to be 20 minutes. The inventory had a maximum score of 64 and a minimum score of *zero*. All items were presented in Malayalam.

Validation

Criterion related validity of the Final ASI was established through Pearson's Product Moment Correlation by correlating the scores obtained by ASI with the scores of *Science Studying Approach Inventory* (SSAI) which was used as a criterion and also meant to measure the same on a representative sample of 46 secondary school pupils. The validity index obtained was 0.60. Pearson's Product Moment Correlation was calculated by the following formula.

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{[N\sum X^2 - (\sum X)^2] [N\sum Y^2 - (\sum Y)^2]}}$$

Reliability:- The reliability of the Final ASI was established by the *split-half* method on a representative sample of 46 students. The items in the inventory were divided into two equal halves with 16 items each and the scores on the first half were correlated with the scores on the second half. The reliability index obtained after correcting with Spearman – Brown formula was found to be 0.729. The Spearman – Brown formula used was the following.

$$r_{xx} = \frac{2r_{xx}}{1 + r_{hh}}$$

Where r_{xx} is the sample estimate of the reliability coefficient and r_{hh} is the reliability of a half test.

Further the *intercorrelations* among the scores of four scales of Approaches to Studying with the Total score of Approaches to Studying were employed to study the *internal consistency* of the test. The correlation matrix with their coefficients are given as follows.

Correlations	Meaning Orientation	Reproducing Orientation	Achieving Orientation	Non-Academic Orientation	Total
Meaning Orientation		0.288	0.200	0.279	0.648**
Reproducing Orientation			0.233	0.345	0.714**
Achieving Orientation				0.264	0.623**
Non-Academic Orientation					0.700**

** P < 0.01

The obtained *validity* and *reliability* indices of the ASI show that the inventory is a *valid* and *reliable* tool for measuring the approaches to Studying of Secondary School Pupils.

The draft inventory, the response sheet, the English version of draft ASI and the response sheet of English version are presented in Appendices II, IIA, IIB and IIC respectively and the final ASI, the response sheet, the English

version of final ASI and the response sheet of English version of final ASI are given in Appendices III, IIIA, IIIB and IIIC respectively.

Some illustrative items from the Final Inventory are given in the following.

a. Scale :Meaning Orientation

1. Subscale : Deep Approach

I Conduct practically possible experiments and observations related to my lessons.

Always	Sometimes	Never
--------	-----------	-------

a. Scale: Meaning Orientation

2. Subscale :Inter-relating Ideas

While studying I do not check whether one subject is related with any other subject or not.

Always	Sometimes	Never
--------	-----------	-------

a. Scale : Meaning Orientation

3. Subscale :Use of Evidence

I evaluate the conclusions on the basis of observations and experiences.

Always	Sometimes	Never
--------	-----------	-------

a. Scale :Meaning Orientation

4. Subscale : Intrinsic Motivation

I do the exercises given with the lessons without a direction from my teacher.

Always	Sometimes	Never
--------	-----------	-------

b. Scale : Reproducing Orientation**1. Subscale : Surface Approach**

While studying I frequently check whether the learned facts are there in my mind or not.

Always	Sometimes	Never
--------	-----------	-------

b. Reproducing Orientation**2. Subscale : Syllabus boundness**

I do not have the habit of reading the lessons as directed by the teacher.

Always	Sometimes	Never
--------	-----------	-------

b. Scale : Reproducing Orientation**3. Subscale : Fear of failure**

I am not afraid of examinations.

Always	Sometimes	Never
--------	-----------	-------

b. Scale : Reproducing Orientation**4. Subscale : Extrinsic Motivation**

I study because of the compulsion of elders.

Always	Sometimes	Never
--------	-----------	-------

c. Scale : Achieving Orientation**1. Subscale : Strategic Approach**

I study for applying the acquired knowledge in real life.

Always	Sometimes	Never
--------	-----------	-------

c. Scale : Achieving Orientation

2. Subscale : Disorganised study method

I do not have the habit of doing homework regularly.

Always	Sometimes	Never
--------	-----------	-------

c. Scale : Achieving Orientation

3. Subscale : Negative Attitude to Studying

I do not feel that studying is a tedious experience.

Always	Sometimes	Never
--------	-----------	-------

c. Scale : Achieving Orientation

4. Subscale : Achievement Motivation

I take passing the examination as a challenge.

Always	Sometimes	Never
--------	-----------	-------

d. Scale : Non Academic Orientation

1. Subscale : Comprehension learning

I have the habit of recording the similar concepts in content material in a note book.

Always	Sometimes	Never
--------	-----------	-------

d. Scale : Non Academic Orientation

2. Subscale : Operation Learning

I check the conclusions using empirical evidences.

Always	Sometimes	Never
--------	-----------	-------

d. Scale : Non Academic Orientation

3. Subscale : Globetrotting

I arrive at conclusions only after cautious and detailed study.

Always	Sometimes	Never
--------	-----------	-------

d. Scale : Non Academic Orientation

4. Subscale : Improvidence

Before accepting concepts from study materials, I thoroughly check every details related to it.

Always	Sometimes	Never
--------	-----------	-------

3.4.1.3. SCALE OF CLASSROOM CLIMATE (SCC)

Inorder to measure the influence of Classroom Climate on the Achievement of secondary school pupils, a Scale of Classroom Climate constructed and standardised by Usha and Sunitha (1997) was used. This scale carries 58 items, and the items are in the form of 46 positive and 12 negative statements. The Scale has eight Classroom Climate elements. They are: (1) *Physical climate* (2) *Classroom satisfaction* (3) *Positive Teacher characteristics* (4) *Negative Teacher characteristics* (5) *Democracy* (6) *Friction* (7) *Sources of popularity* and (8) *Learning Climate*.

The subjects were required to rate each statement on a three point scale corresponding to the answer, *Agree*, *Uncertain* and *Disagree* or *Always*, *Sometimes* and *Never*. The respondent had to choose any one of them. The items in the scale were prepared mainly based on the elements as given previously in the Classroom Climate instruments developed by Fraser, *et al.* (1982).

The scoring of the positive and negative items of the scale are as follows:

Positive item	Score	Negative item	Score
Agree/ Always	2	Agree / Always	0
Uncertain / Sometimes	1	Uncertain / Sometimes	1
Disagree / Never	0	Disagree / Never	2

The scoring procedure was reversed for a negative item. Thus for the Scale of Classroom Climate, a pupil can get a minimum score of zero and a maximum score of 116. The time fixed for completing the scale was 40 minutes.

The validity of the Scale of Classroom Climate as reported by the scale constructors was **0.789**. Reliability of the test was estimated by the test retest method and the coefficient obtained was **0.901**. Validity and reliability showed that the tool is an adequate one for measuring the variable Classroom Climate.

A copy of the Scale of Classroom Climate in Malayalam, the response sheet, its corresponding English version and the response sheet of English version are presented in Appendices IV, IVA, IVB and IVC. A few illustrative items from the Scale of Classroom Climate follows.

Illustrative items

- a. The students are free to mingle with the teacher.

Agree	Uncertain	Disagree
-------	-----------	----------

b. Students are scared to ask doubts to the teacher.

Agree	Uncertain	Disagree
-------	-----------	----------

c. Enough light is available in the class.

Agree	Uncertain	Disagree
-------	-----------	----------

d. All the students listen to the teacher, while teaching lessons.

Always	Sometimes	Never
--------	-----------	-------

e. Students of my class behave badly with me.

Always	Sometimes	Never
--------	-----------	-------

3.4.1.4. ACHIEVEMENT TEST IN SOCIAL SCIENCES (ATSS)

Achievement Test in Social Sciences was constructed and standardised by the investigator for measuring the *Achievement in Social Sciences* of secondary school pupils in Kerala. It was strictly based on the Taxonomy of Educational Objectives suggested by Bloom (1979). The procedure adopted for the construction and standardisation of Achievement Test in Social Sciences (ATSS) is described in the following parts.

Planning of the Test

The investigator thoroughly studied the curriculum, syllabus and text books of Social Sciences for standard IX prescribed by the Department of Education, Kerala for the academic year 2000-2001. Question banks, Social Science question papers used by the Department of Education for the terminal and annual examinations of standard IX and reference books of History, Geography, Economics & Political Science were also referred by the

investigator. Further the investigator sought the advice and guidance of subject experts and experienced teachers of Social Sciences. Two important books referred for the preparation of the test were Taxonomy of Educational Objectives (Bloom, 1979) and Essentials of Educational Measurement (Ebel & Frisbie, 1991).

It was decided to include only objective type with multiple choice items because the areas to be covered were vast and the duration of the test was initially fixed for 60 minutes. The maximum items fixed for the final test was 60.

Preparation of the Test

Items for the Achievement Test in Social Sciences were prepared on the basis of the major objectives in the cognitive domain namely *Knowledge, Comprehension, Application, Analysis, Synthesis* and *Evaluation* (Bloom, 1979). When the test was prepared due weightage was given to objectives and content.

Weightage to Objectives

Objectives for the test were selected based on Bloom's Taxonomy of Educational Objectives (Bloom, 1979). The weightage given to different objectives for the achievement test is given in Table 3.4.

TABLE 3.4
Weightage to Objectives

Sl. No.	Objectives	No. of questions	Percentage
1.	Knowledge	12	20
2.	Comprehension	21	35
3.	Application	9	15
4.	Analysis	6	10
5.	Synthesis	6	10
6.	Evaluation	6	10
	Total	60	100

Weightage to Content

The investigator analysed the content area of Social Sciences for standard IX in Kerala state to decide the weightage to be given. As per the importance given in the syllabus for each subject, adequate weightage was given to the subjects of Social Sciences viz., History, Geography, Economics and Civics. The weightage given to each subject is given in Table 3.5.

TABLE 3.5
Weightage to Content

Sl. No.	Content	No. of questions	Percentage
1.	History	21	35
2.	Geography	21	35
3.	Economics	9	15
4.	Civics	9	15
	Total	60	100

Blue Print

The two dimensional blue print of the test specifying the content covered in relation to the weightages assigned for different objectives and content is shown in Table 3.6. Here the investigator opted only the objective type items and therefore for the test, the blue print is a two dimensional chart indicating the content area and the number of questions under each instructional objective.

TABLE 3.6
Blue Print for Achievement Test in Social Sciences

Objectives Content	Know- ledge	Comp- rehen- sion	Appli- cation	Ana- lysis	Syn- thesis	Evalua- tion	Total
History	4	8	3	2	2	2	21
Geography	5	7	3	2	2	2	21
Economics	2	3	1	1	1	1	9
Civics	1	3	2	1	1	1	9
Total	12	21	9	6	6	6	60

Based on the blue print, the investigator prepared 120 objective type items (double the number of items needed) giving due weightage to content and objectives. Four possible answers were given to each item in the draft ATSS. Among the four, only one was the correct answer and the remaining three were distractors. The subject had to choose the most appropriate answer from the four possible answers given and put a (X) mark on the separate response sheet provided.

Try out

The draft ATSS which carried 120 items was administered on a representative sample of 400 pupils of standard IX. While selecting the sample for try out, adequate weightage was given to Sex, Locale of the subjects and Type of Management of the schools.

Item Analysis

Item analysis of the draft ATSS was done as per the method suggested by Ebel and Frisbie (1991). 380 response sheets which are complete in all respects were obtained for item analysis. By random rejection the number was again reduced to 370 to facilitate computational procedure. The draft ATSS directed the pupils to choose the correct answer from the four distractors given along with each item. For a correct response *one* score was allotted and for an incorrect response *no* score was given.

The scored answer sheets were arranged in the descending order of scores. The upper 100 sheets (27%) and lower 100 sheets (27%) were treated as high and low groups respectively. Following the procedure suggested by Ebel and Frisbie (1991) the items of the test were analysed by computing the indices of *item difficulty* and *discrimination power*. This was done using the following formula (Ebel & Frisbie, 1991)

$$\text{Index of item difficulty} = \frac{U+L}{2N}$$

$$\text{Index of Discrimination Power} = \frac{U - L}{N}$$

Where U = Number of correct answers in the upper group
 L = Number of correct answers in the lower group
 N = Number of subjects in both the groups.

The data related to item analysis is presented in Table 3.7.

TABLE 3.7

Item Analysis Data of Achievement Test in Social Sciences

Item Number	Objective	Difficulty Index	Discrimination power	Item Selected/ Rejected
1.	Knowledge	0.85	0.09	Rejected
2.	„	0.37	0.67	Selected
3.	„	0.49	0.30	Selected
4.	..	0.37	0.18	Rejected
5.	„	0.23	0.20	Rejected
6.	„	0.83	0.24	Rejected
7.	„	0.64	0.38	Selected
8.	„	0.51	0.33	Selected
9.	„	0.26	0.06	Rejected
10.	„	0.50	0.06	Rejected
11.	„	0.47	0.27	Rejected
12.	„	0.30	0.59	Selected
13.	„	0.35	0.05	Rejected
14.	„	0.49	0.30	Selected
15.	„	0.26	0.07	Rejected
16.	„	0.67	0.43	Selected
17.	„	0.50	0.37	Selected
18.	„	0.52	0.30	Selected
19.	„	0.36	0.13	Rejected
20.	„	0.46	0.15	Rejected
21.	„	0.57	0.30	Selected

contd.....

Item Number	Objective	Difficulty Index	Discrimination power	Item Selected/ Rejected
22.	Knowledge	0.57	0.31	Selected
23.	"	0.53	0.42	Selected
24.	"	0.19	0.01	Rejected
25.	Comprehension	0.63	0.50	Selected
26.	"	0.48	0.36	Selected
27.	"	0.54	0.54	Selected
28.	"	0.44	0.89	Selected
29.	"	0.44	0.50	Selected
30.	"	0.22	0.13	Rejected
31.	"	0.17	0.34	Rejected
32.	"	0.37	0.37	Selected
33.	"	0.55	0.38	Selected
34.	"	0.23	0.09	Rejected
35.	"	0.31	0.16	Rejected
36.	"	0.22	0.09	Rejected
37.	"	0.32	0.37	Selected
38.	"	0.34	0.24	Rejected
39.	"	0.60	0.48	Selected
40.	"	0.50	0.35	Selected
41.	"	0.45	0.33	Selected
42.	"	0.42	0.38	Selected
43.	"	0.27	0.14	Rejected
44.	"	0.60	0.43	Selected
45.	"	0.27	0.08	Rejected
46.	"	0.37	0.26	Rejected
47.	"	0.52	0.57	Selected
48.	"	0.25	0.05	Rejected
49.	"	0.39	0.35	Selected

contd...

Item Number	Objective	Difficulty Index	Discrimination power	Item Selected/ Rejected
50.	Comprehension	0.35	0.25	Rejected
51.	"	0.25	0.15	Rejected
52.	"	0.04	0.32	Selected
53.	"	0.36	0.20	Rejected
54.	"	0.37	0.25	Rejected
55.	"	0.28	0.14	Rejected
56.	"	0.42	0.49	Selected
57.	"	0.51	0.43	Selected
58.	"	0.32	0.02	Rejected
59.	"	0.39	0.47	Selected
60.	"	0.36	0.23	Rejected
61.	"	0.21	-0.01	Rejected
62.	"	0.23	0.24	Rejected
63.	"	0.47	0.53	Selected
64.	"	0.43	0.30	Selected
65.	"	0.35	0.10	Rejected
66.	"	0.28	0.12	Rejected
67.	Application	0.25	0.07	Rejected
68.	"	0.23	0.15	Rejected
69.	"	0.34	0.30	Selected
70.	"	0.35	0.22	Rejected
71.	"	0.41	0.33	Selected
72.	"	0.30	0.11	Rejected
73.	"	0.34	0.19	Rejected
74.	"	0.14	0.01	Rejected
75.	"	0.52	0.65	Selected
76.	"	0.43	0.30	Selected

contd....

Item Number	Objective	Difficulty Index	Discrimination power	Item Selected/ Rejected
77.	Application	0.21	0.17	Rejected
78.	"	0.18	0.12	Rejected
79.	"	0.52	0.45	Selected
80.	"	0.32	-0.03	Rejected
81.	"	0.47	0.54	Selected
82.	"	0.35	0.30	Selected
83.	"	0.37	0.30	Selected
84.	"	0.37	0.42	Selected
85.	Analysis	0.39	0.30	Selected
86.	"	0.34	0.09	Rejected
87.	"	0.26	0.18	Rejected
88.	"	0.24	0.21	Rejected
89.	"	0.36	0.15	Rejected
90.	"	0.24	-0.05	Rejected
91.	"	0.47	0.30	Selected
92.	"	0.28	0.17	Rejected
93.	"	0.30	0.59	Selected
94.	"	0.30	0.52	Selected
95.	"	0.25	0.42	Selected
96.	"	0.34	0.69	Selected
97.	Synthesis	0.37	0.33	Selected
98.	"	0.32	0.25	Selected
99.	"	0.31	0.11	Rejected
100.	"	0.27	-0.05	Rejected
101.	"	0.36	0.25	Selected
102.	"	0.35	0.11	Rejected
103.	"	0.30	0.12	Rejected

contd....

Item Number	Objective	Difficulty Index	Discrimination power	Item Selected/ Rejected
104.	Synthesis	0.19	0.12	Rejected
105.	„	0.19	0.15	Rejected
106.	„	0.28	0.26	Selected
107.	„	0.30	0.61	Selected
108.	„	0.35	0.70	Selected
109.	Evaluation	0.30	0.60	Selected
110.	„	0.31	0.63	Selected
111.	„	0.37	0.75	Selected
112.	„	0.41	0.14	Rejected
113.	„	0.18	0.37	Rejected
114.	„	0.21	0.42	Rejected
115.	„	-0.26	0.22	Rejected
116.	„	0.23	0.47	Rejected
117.	„	0.36	0.73	Selected
118.	„	0.23	0.46	Rejected
119.	„	0.27	0.55	Selected
120.	„	0.25	0.50	Selected

On the basis of item analysis 60 items from the draft ATSS were selected for the Final Test. Items having the difficulty index ranging between 0.4 and 0.6 with discriminating power 0.30 and above were readily selected. But a few items having the difficulty index 0.25 and above and the discrimination power between 0.25 and 0.30 were also chosen so as to comply with the blue print. All the 60 items selected were arranged in the order of *increasing difficulty*. The time required to respond to the Final ATSS is 60 minutes. All items were presented in Malayalam.

Validation

In order to establish the face validity of the Final ATSS, it was submitted to a panel of experts, that certified it by scrutinising the items of the test.

The panel further certified that the items of ATSS are complying with the instructional objectives of the test and the content matter covered in it are competent to serve the purpose. Thus the *content validity* of the ATSS is also established.

The *criterion related validity* of the final ATSS was established through Pearsons Product Moment Correlation by correlating against the scores of a previously standardised ATSS for 43 students of class IX. The correlation coefficient obtained was **0.63**.

Reliability

Inorder to establish the reliability of the final ATSS the *split half* method was worked on a representative sample of 43 students. For this the items in the ATSS were divided into two equal halves and the scores of these two halves were correlated. The reliability obtained after correcting with Spearman – Brown Formula was **0.76**.

To study the internal consistency of the test the objective wise inter correlation with the Total Achievement score was also employed which is presented as follows.

Correlations	Know- ledge	Compre- hension	Applica- tion	Analysis	Synthe- sis	Evaluat- ion	Total
Knowledge		0.549	0.399	0.167	0.191	0.024	0.733 **
Compre- hension			0.506	0.164	0.242	0.011	0.861**
Application				0.241	0.279	0.084	0.722**
Analysis					0.146	0.052	0.385**
Synthesis						0.137	0.454**
Evaluation							0.216*

** $P < 0.01$

* $P < 0.05$

The indices of *validity* and *reliability* indicates that the ATSS has acceptable psychometric properties to measure the Achievement in Social Sciences of Secondary School Pupils.

A copy of the draft Achievement Test in Social Sciences (ATSS) the Response Sheet, English version of draft ATSS, the Response sheet of English version and scoring key are presented in Appendices V, VA, VB, VC and VD respectively. A copy of final ATSS, the Response sheet, English version of final ATSS, the Response sheet of English version and scoring key are given in Appendices VI, VIA, VIB, VIC and VID respectively.

A few illustrative items from the final ATSS are presented as follows.

a. Knowledge

Name the alphabet used by Ancient Egyptians.

- A. Cuneiform B. Teracotta C. Arabic D. Hieroglyphics

A	B	C	D
---	---	---	---

b. Comprehension

What type of places are suitable for the emergence of civilizations?

- A. Coastal areas B. River valleys C. Plateaus D. Plains

c. Application

What effort you will make considering the fact that man may have to depend more on ocean in future?

- A. Desisting from sea wars. B. Preventing deep sea fishing.
C. Preventing sea pollution D. Abolishing oil excavation in sea.

d. Analysis

How do you describe the functioning of village panchayaths in Kerala?

- A. Protecting the agro-industrial requirements of villages.
B. Protecting the democratic and civic rights of villagers.
C. Basic democratic and self governing bodies of villages.
D. Self governing bodies that irradiate unemployment of villagers.

A	B	C	D
---	---	---	---

e. Synthesis

Under utilisation of resources, shortage of capital, high growth rate of population are the features of Indian economy. These features show that Indian economy is an example for one of the following economies. Choose it.

- A. Developing economy
- B. Capitalist economy
- C. Developed economy
- D. Mixed economy

A	B	C	D
---	---	---	---

f. Evaluation

In Japan due to heavy burden of taxation, peasants deserted the lands. So the Government redistributed the land to Samarai or warriors. How do you evaluate this situation?

- A. Government had no other option.
- B. It was harmful to peasants who are the real producers in the farm sector.
- C. Peasants should have paid the tax by raising the output.
- D. Though it was harmful to peasants Samarais benefitted by it.

3.4.2. SAMPLE FOR THE STUDY

As per the statement of the problem, the secondary school pupils form the target population for the study. The investigator has to draw adequate number of sample by consolidating the following aspects.

- a. Sample size
- b. Sampling technique and
- c. Factors to be represented in the sample.

3.4.2.1. Sample size

The size of the sample for the study was initially fixed to be 1000. Such a large sample is fixed inorder to include sufficiently large number of sub-samples for statistical processing. The larger the sample the larger the

standard deviations of the sample and the more inclusive (and presumably, representative) the sample become the general population (Garret, 1981).

3.4.2.2. Sampling Technique

Proportionate stratified sampling technique was adopted for the investigation. By stratification bias can be avoided and confirms greater representation (Guilford & Frechter, 1978). The population for the study was secondary school pupils that are highly heterogeneous in nature having known strata such as Rural/Urban, Boys/Girls, Government/Private and these are in definite proportions. Stratification is the most appropriate technique in such situations for drawing representative sample.

3.4.2.3. Factors to be represented in the sample

While selecting the sample due representation was given to the following factors.

- a. Sex of the subjects: – Boys – Girls in the ratio 1:1.
- b. Locale of the school: – Rural – Urban in the ratio 2:1.
- c. Type of management of schools: – Private – Government in the ratio 2:1.
- a) Sex

Boys and Girls are found to differ in their achievement. They may follow different study methods and learning strategies that influence achievement. In the selection of sample equal consideration was given to Boys and Girls.

b) Locale

The student performance is directly related to the location of the School (Rural and Urban). Usually urban schools as a whole attain greater instructional efficiency when compared with rural schools. As the number of schools in rural area is more than urban area the selection of sample was in the proportion 2:1.

c) Management of Schools

Among the schools in Kerala, more than sixty percent are run by private agencies. Many of these schools are functioning more efficiently than schools managed by the State Department of Education. Hence the sample was selected in the proportion 2:1.

Considering the factors as explained, the investigator formulated a scheme of a tentative sample for the study. The break-up of the initial sample is presented as follows.

Break-up of the Initial Sample

Sex of the sample	Rural		Urban		Total
	Government	Private	Government	Private	
Boys	111	222	56	111	500
Girls	111	222	56	111	500
Total	222	444	112	222	
	666		334		
	1000				1000

In the selection of sample adequate representation was given to schools located in different districts. Schools of Kasargod, Kannur, Kozhikkode and Malappuram districts were selected for the present study.

3.4.3. MODE OF DATA COLLECTION SCORING AND CONSOLIDATION OF DATA

The investigator personally visited the schools selected and obtained prior permission from the concerned Heads. Two days were arranged as per the schedule fixed in each school.

3.4.3.1. Mode of Data Collection

The investigator required to conduct four tests on the sample selected. On the first day Learning Style Inventory and Approaches to Studying Inventory were administered and on the second day Scale of Classroom Climate and Achievement Test in Social Sciences were administered. Each test had its own time schedule. The tests were conducted in the months of January-February, 2001 with due co-operation from the concerned authorities.

Sufficient number of printed test materials and response sheets were provided to pupils who were chosen as sample for the study. Before administering the tests they were asked to go through the instructions thoroughly and propped up doubts were cleared immediately. By all means, the pupils were put in ideal conditions for testing. Accordingly data from 960 pupils were collected.

3.4.3.2. Scoring and Consolidation of Data

Scoring was done as per the scheme provided with various tests. Punched scoring key is used to score the Achievement Test in Social Sciences.

Scores on Independent (Component wise and Total Score) and Dependent Variables (Objective wise and Total Score) were consolidated and coded for computer processing. As the incomplete response sheets had to be deleted, the size of the final sample reduced to 917. A break-up of final sample follows.

Break-up of the Final Sample

Sex of the sample	Rural		Urban		Total
	Government	Private	Government	Private	
Boys	98	178	57	109	442
Girls	108	227	51	89	475
Total	206	405	108	198	
	611		306		
	917				917

School wise details of the final sample are presented in Table 3.8.

TABLE 3.8

Details of the Final Sample

Sl. No.	Name of the School	Locale (Rural/Urban)	Management (Govt./Private)	No. of students		
				Boys	Girls	Total
1.	C.H.M.K.S. Govt. H.S.S. Mattool	Rural	Govt.	16	19	35
2.	Moothedath High School, Thalipparamaba	Urban	Private	42	39	81
3.	Puthiyangadi Jama-ath H.S. Madai	Rural	Private	21	21	42
4..	Iqbal High school Ajanur, Kanhangad	Urban	Private	24	13	37

contd....

Sl. No.	Name of the School	Locale (Rural/Urban)	Management (Govt./Private)	No. of students		
				Boys	Girls	Total
5.	N.S.S. Higher Sec. School, Alakkode	Rural	Private	15	24	39
6.	Govt. High School, Kadannappalli	Rural	Govt.	17	21	38
7.	Govt. High School, Kunhimangalam	Rural	Govt.	18	18	36
8.	Chattanchal H.S.S., Thekkil	Rural	Private	17	19	36
9.	Rajas H.S. Neeleswaram	Rural	Private	17	21	38
10.	Govt. Higher Sec. School, Vellur	Urban	Govt.	35	29	64
11.	M.K.S.H.S. Kuttamath	Rural	Private	17	21	38
12.	Farooque Higher Sec. School, Feroke, Calicut	Rural	Private	25	25	50
13.	V.P.K. Memorial H.S. Pallikkal	Rural	Private	19	20	39
14.	Chakkalakkal High School, Arambram	Rural	Private	23	19	42
15.	S.O.S. High School, Areecode, Malappuram	Rural	Private	24	19	43
16.	Kunnamangalam High School, Kunnamangalam	Rural	Private	--	38	38
17.	St. Joseph's Higher Sec. School Calicut	Urban	Private	43	-	43
18.	Calicut Girls High School, Calicut	Urban	Private	-	37	37
19.	M.C.C. High School, Medical College, Calicut	Urban	Govt.	22	22	44
20.	Govt. High School, Koduvally	Rural	Govt.	47	50	97
Total				442	475	917

3.4.4. STATISTICAL TECHNIQUES USED FOR ANALYSIS OF DATA

The main statistical techniques employed for the present study are described as follows:-

3.4.4.1. Preliminary Analysis

For the preliminary analysis of the data collected the important statistical constants computed for the Independent and Dependent variables were means, standard deviations, skeweness and Kurtosis for the Total sample and Sub-sample based on Sex, Locale and Type of Management of the School. In order to examine the Sex Difference in Independent and Dependent Variables, *two-tailed test of significance of difference between means* was employed for the Total sample and Sub-samples based on Sex, Locale and Type of Management of the school.

3.4.4.2. Major Analysis

For major analysis the statistical technique adopted were *Three-way ANOVA with 3x3x3 factorial design, Scheffe' test of Post-hoc comparison* and *Multiple Regression Analysis – Stepwise*.

Three-way ANOVA

Three-way Analysis of Variance has been employed with 3x3x3 factorial design to determine the main and interaction effects of the Independent Variables on Dependent Variables.

Analysis of Variance employing Three Independent variables involving three way classification is the three way ANOVA, which involve **R** levels of one factor, **C** levels of second factor and **L** levels of a third factor, the number of treatment combinations being **RCL**.

A model **Three-way ANOVA** with 3x3x3 factorial design follows in Table 3.9.

TABLE 3.9
Three-way Model ANOVA

Source	Degrees of freedom	Sums of squares	
<i>A</i>	$a - 1$	SS_A	$= nbc \sum_i \hat{\alpha}_i^2$
<i>B</i>	$b - 1$	SS_B	$= ncl \sum_j \hat{\beta}_j^2$
<i>C</i>	$c - 1$	SS_C	$= nbl \sum_k \hat{\gamma}_k^2$
<i>A * B</i>	$(a - 1)(b - 1)$	SS_{A*B}	$= nc \sum_{ij} (\hat{\alpha}\hat{\beta})_{ij}^2$
<i>A * C</i>	$(a - 1)(c - 1)$	SS_{A*C}	$= nb \sum_{ik} (\hat{\alpha}\hat{\gamma})_{ik}^2$
<i>B * C</i>	$(b - 1)(c - 1)$	SS_{B*C}	$= nl \sum_{jk} (\hat{\beta}\hat{\gamma})_{jk}^2$
<i>A * B * C</i>	$(a - 1)(b - 1)(c - 1)$	SS_{A*B*C}	$= n \sum_{ijk} (\hat{\alpha}\hat{\beta}\hat{\gamma})_{ijk}^2$
error	$abc(n - 1)$	SS_{ERROR}	$= \sum_{ijkl} (y_{ijkl} - \hat{\mu}_{ijk})^2$
total	$abcn - 1$	SS_{TOTAL}	$= \sum_{ijkl} (y_{ijkl} - \bar{y}_{....})^2$

For the 3x3x3 factorial ANOVA three levels of Learning Style namely, Highly Preferred Learning Style (HPLS), Moderately Preferred Learning Style (MPLS) and Less Preferred Learning Style (LPLS), three levels of Approaches to Studying as Highly Desirable Approaches to Studying (HDAS), Moderately Desirable Approaches to Studying (MDAS) and Less Desirable Approaches to Studying (LDAS) and three levels of Classroom Climate, Highly Favourable Classroom Climate (HFCC), Moderately Favourable Classroom Climate (MFCC) and Less Favourable Classroom Climate (LFCC) were adopted.

Three-way ANOVA was employed separately for Achievement in Social Sciences (Total score) and Objective wise scores in Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation for the Total Sample and the Sub-samples based on Sex, Locale, and Type of Management of the school.

Based on the scores of Independent Variables, each subject in the sample is identified as belonging to any one of the 27 combinations stated as follows.

1. Highly Favourable Classroom Climate with Highly Preferred Learning Style and Highly Desirable Approaches to Studying.
2. Highly Favourable Classroom Climate with Highly Preferred Learning Style and Moderately Desirable Approaches to Studying.
3. Highly Favourable Classroom Climate with Highly Preferred Learning Style and Less Desirable Approaches to Studying.

4. Highly Favourable Classroom Climate with Moderately Preferred Learning Style and Highly Desirable Approaches to Studying.
5. Highly Favourable Classroom Climate with Moderately Preferred Learning Style and Moderately Desirable Approaches to Studying.
6. Highly Favourable Classroom Climate with Moderately Preferred Learning Style and Less Desirable Approaches to Studying.
7. Highly Favourable Classroom Climate with Less Preferred Learning Style and Highly Desirable Approaches to Studying.
8. Highly Favourable Classroom Climate with Less Preferred Learning Style and Moderately Desirable Approaches to Studying.
9. Highly Favourable Classroom Climate with Less Preferred Learning Style and Less Desirable Approaches to Studying.
10. Moderately Favourable Classroom Climate with Highly Preferred Learning Style and Highly Desirable Approaches to Studying.
11. Moderately Favourable Classroom Climate with Highly Preferred Learning Style and Moderately Desirable Approaches to Studying.
12. Moderately Favourable Classroom Climate with Highly Preferred Learning Style and Less Desirable Approaches to Studying.
13. Moderately Favourable Classroom Climate with Moderately Preferred Learning Style and Highly Desirable Approaches to Studying.
14. Moderately Favourable Classroom Climate with Moderately Preferred Learning Style and Moderately Desirable Approaches to Studying.

15. Moderately Favourable Classroom Climate with Moderately Preferred Learning Style and Less Desirable Approaches to Studying.
16. Moderately Favourable Classroom Climate with Less Preferred Learning Style and Highly Desirable Approaches to Studying.
17. Moderately Favourable Classroom Climate with Less Preferred Learning Style and Moderately Desirable Approaches to Studying.
18. Moderately Favourable Classroom Climate with Less Preferred Learning Style and Less Desirable Approaches to Studying.
19. Less Favourable Classroom Climate with Highly Preferred Learning Style and Highly Desirable Approaches to Studying.
20. Less Favourable Classroom Climate with Highly Preferred Learning Style and Moderately Desirable Approaches to Studying.
21. Less Favourable Classroom Climate with Highly Preferred Learning Style and Less Desirable Approaches to Studying.
22. Less Favourable Classroom Climate with Moderately Preferred Learning Style and Highly Desirable Approaches to Studying..
23. Less Favourable Classroom Climate with Moderately Preferred Learning Style and Moderately Desirable Approaches to Studying.
24. Less Favourable Classroom Climate with Moderately Preferred Learning Style and Less Desirable Approaches to Studying.
25. Less Favourable Classroom Climate with Less Preferred Learning Style and Highly Desirable Approaches to Studying.
26. Less Favourable Classroom Climate with Less Preferred Learning Style and Moderately Desirable Approaches to Studying.

27. Less Favourable Classroom Climate with Less Preferred Learning Style and Less Desirable Approaches to Studying.

Scheffe' Test of Post-hoc Comparison

Three-way ANOVA was followed by Post-hoc comparison between the pairs of different levels of Independent Variables on the means of Achievement in Social Sciences (Objective wise and Total Score). This was attempted whenever the ANOVA showed significant F- ratios (Ferguson, 1976) to locate the exact levels of Independent Variables which differ in their mean achievement scores. Scheffe' Test employed separately for Total sample and the Sub-samples based on Sex, Locale and Type of Management of the school.

The F- ratio between pairs of means by using the within group variance and the F' was calculated. The values of F were compared with the values of F' at the 0.05 level and 0.01 level. A significant difference between the pairs of means is judged at the required levels only when the values of F is equal to or greater than F' .

Multiple Regression Analysis - Step wise

Multiple Regression is a statistical device used for analysing the collective and separate contributions of two or more independent variables (X_i) to the variation of a dependent variable (Y). It can be used to check whether certain variables are caused or preceded by others to derive a functional relationship between the two sets.

This statistical technique helps to *predict* a criterion or dependent variable from a set of *predictor* or independent variables (Tacq, 1997). The

predictor variables are entered one by one to find out the influence of each variable in predicting the criterion variable. First, the predictor variable having the highest correlation with the criterion variable is entered and then calculate the measures like F , R , R^2 , adjusted R^2 , Partial Regression Coefficients B , the Intercept B_0 , Beta weights and Significance of t etc.

Using the F value obtained it is possible to check whether the regressor (predictor variable entered) is significant or not. If the F -value exceeds the tabled value of F for a particular level of significance for appropriate degree of freedom, the regressor is significant. The investigator can then prepare the equation to the regression line using these quantities.

In step II the predictor variable having the next largest correlation is entered. If the percentage variance contributed by the two variables is considerably higher than the percentage variance contributed by the first variable, then it can be assumed that this variable is also a significant predictor. Along with this, the equation to the regression line and R can be calculated from the regression weights computed. If the R also has increased considerably from the previous R , this is an evidence that the predictor variable second entered is also significant in predicting the criterion variable.

The general regression equation for any number of variables is given as follows:

Y - Dependent Variable

X - Independent Variable

$Y' = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + \dots B_KX_K$

B_0 - The slope (intercept), the value of Y when X_1 is equal to zero

- B_1 - Regression coefficient for the Independent Variable X_1 - The change in Y per unit increase in X_1
- X_1 - First predictor variable
- B_2X_2 - Coefficient and variable for the second predictor variable X_2
- B_KX_K - Coefficient and variable for the ' K^{th} ' predictor variable - X_K .

To determine the predictive strength of the relationship we have to compute a static referred to as Multiple R. This static is just the Pearsons correlation (r) between the subjects real Y score and the Y' (predictive) based on the equation $Y' = B_0 + X_1B_1 + X_2B_2 \dots X_KB_K$. Thus

$$\text{Multiple R} = r_{y,y'}$$

If the R is high, then the equation predicts the real scores well. Multiple Regression analysis will throw light upon the following issues:

1. Does the equation right?
2. What variable should there be in the equation?
3. How should test them?
4. How good is the equation?

Objectives of the Technique

1. To look for a function $Y_1 = B_0 + B_1X_1 + B_2X_2 \dots + B_KX_K$ which represents the linear relationship between X_1 and Y better than among other equations. This comes down to the calculation of Regression Coefficient B_1 and the intercept B_0 .

2. To investigate the magnitude of relationship between X_1 and Y and to predict which part of the variance of Y is explained by the variance of X_1 . This comes down to the calculation of the correlation coefficient $r_{Y'}$ and its square $r^2_{Y'}$ respectively.
 3. To investigate whether the relationship between X_1 and Y that is found in the sample can be generalised to the population. This comes down to the application of a significance test of the relationship.
1. **Calculation of the Standardised Partial Regression coefficient β & B_0**

$$\beta_1 = \frac{\sum X_1 Y - n \bar{Y} \bar{X}_1}{\sum X_1^2 - n \bar{X}_1^2}$$

$$B_0 = \bar{Y} - B_{Y'} \bar{X}_1$$

$\bar{X}, \bar{Y}$ - Mean values of X_1 and Y_1

Standard deviation is made equal to 1. Beta weights are most suitable to determine the relative importance of the predictors X_1 and X_2 . ***Beta must not be greater than 1.***

If Beta greater than 1 is obtained, the reason is an excessively strong association between the causal factors X_1 and X_2 (Multicollinearity). Tolerance is used for dealing multicollinearity. When multicollinearity measured, tolerance will decrease, hence standard error will become greater, so that precision becomes smaller.

2. Strength of Association of the Relationship and the Explained Variance

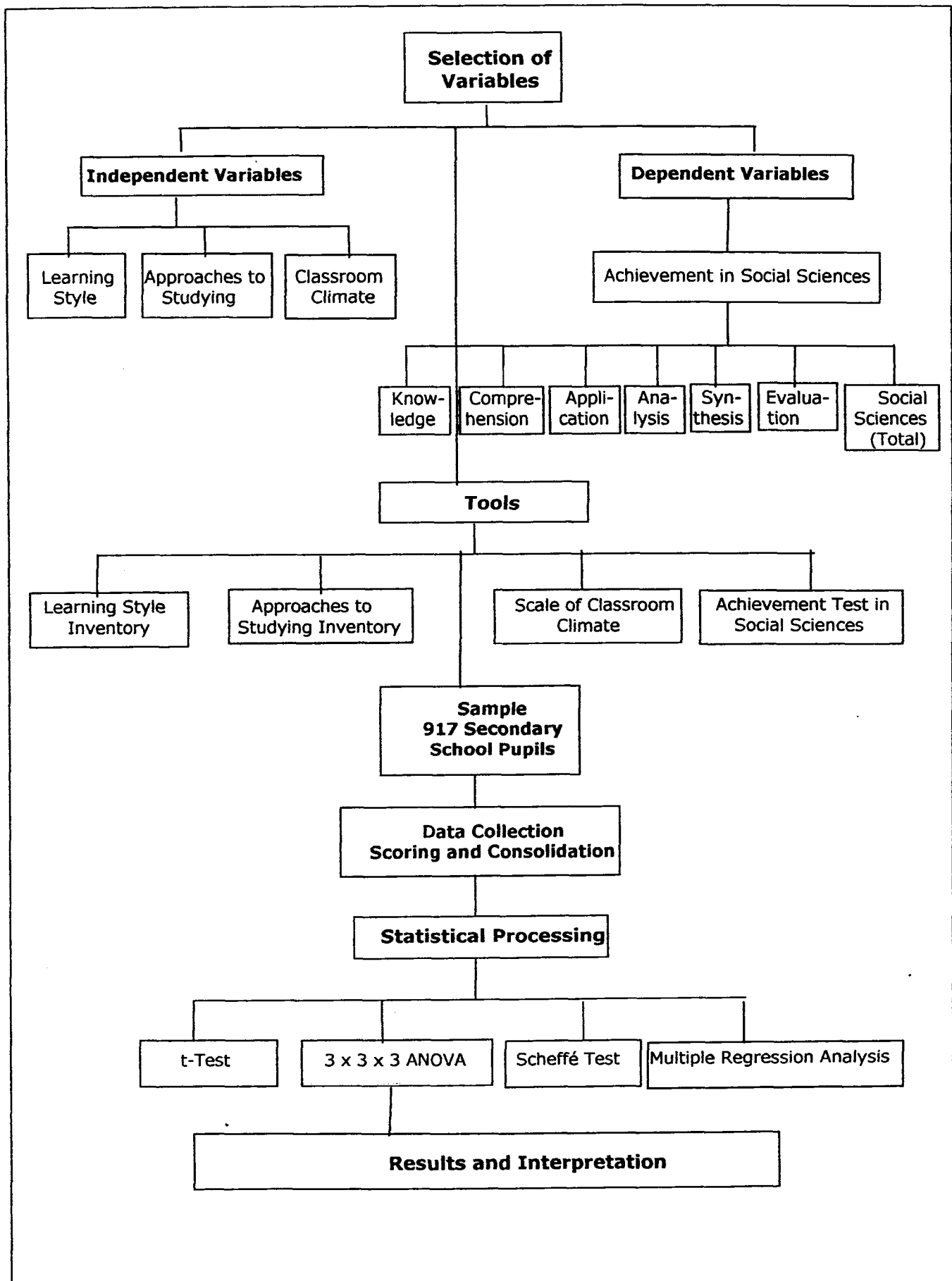
R = the linear association between Y on the one hand and X_1 and X_2 on the other, by means of the multiple correlation coefficient R and the square of R is the multiple determination and represents the proportion of explained variance.

$$R = r_{y,y'}$$

t -tests for the significance of B_0 , B_1 and B_2 terms are used to determine whether the term is to be included in the equation. If the term is not statistically significant then it really should not be used in the equation, despite its numerical value.

3.4.5. SUMMARY OF PROCEDURE

The flow chart given in this part of the report explains the various steps in the procedure of the present study.



Chapter 4

ANALYSIS OF DATA

-
- ❖ *Preliminary Analysis*
 - ❖ *Investigation of Sex Difference*
 - ❖ *Identification of Learning Style Preferences*
 - ❖ *Identification of Study Approaches*
 - ❖ *Major Analysis*
 - ❖ *Analysis of Variance for Achievement*
 - ❖ *Procedure for Classification*
 - ❖ *Discussion of the results of ANOVA for Achievement*
 - ❖ *Multiple Regression Analysis - Stepwise*
-

CHAPTER 4

ANALYSIS OF DATA

Analysis of the data for the present investigation was carried out with a view to find out how the independent variables viz., *Learning Style*, *Approaches to Studying* and *Classroom Climate* influence the Dependent Variables, viz., *Achievement in Social Sciences* (Objective wise and Total score) of secondary school pupils.

This chapter is organised and presented as in the following scheme:

4.1. PRELIMINARY ANALYSIS

4.1.1. Investigation of Sex Difference

4.1.2. Identification of Learning Style Preferences

4.1.3. Identification of Study Approaches

4.2 MAJOR ANALYSIS

4.2.1. Analysis of Variance for Achievement

4.2.2. Procedure for Classification

4.3 DISCUSSION OF THE RESULTS OF ANOVA FOR ACHIEVEMENT

4.4 MULTIPLE REGRESSION ANALYSIS - STEP WISE

4.1. PRELIMINARY ANALYSIS

As a preliminary analysis the distribution of scores of both the Independent and Dependent variables for the Total Sample and Sub samples based on Sex, Locale and Type of management of school were studied to understand the salient statistical properties.

The statistical constants for the distribution of scores of the Independent Variables viz., Learning Style and Approaches to Studying (Component wise and Total Score) and Classroom Climate (Total Score) and the Dependent Variables viz., Achievement in Social Sciences, (Objective wise and Total Score) are presented in Tables 4.1, 4.2, 4.3 and 4.4.

TABLE 4.1
Statistical Constants for the Distribution of Scores of Independent and Dependent Variables for Total Sample

VARIABLES	Total Sample (N = 917)					
	Mean	Median	Mode	SD	Kurtosis	Skewness
INDEPENDENT VARIABLES						
Environmental	12.354	12.000	12.000	2.433	0.159	-0.142
Emotional	13.399	13.000	13.000	2.436	-0.056	0.079
Sociological	8.906	9.000	8.000	1.987	7.905	0.708
Physical	16.527	17.000	17.000	3.325	2.801	-1.065
Learning Style (Total)	51.186	51.00	52.00	6.218	1.993	-0.431
Meaning Orientation	8.263	8.000	8.000	2.393	-0.028	0.012
Reproducing Orientation	9.126	9.000	8.000	2.668	0.323	0.302
Achieving Orientation	9.569	10.000	10.000	2.413	0.632	-0.150
Non-Academic Orientation	8.752	9.000	8.000	2.451	0.464	0.234
Approaches to Studying (Total)	35.711	35.00	35.00	6.677	0.931	0.560
Classroom Climate	78.204	79.00	86.00	13.609	0.234	-0.45
DEPENDENT VARIABLES						
Knowledge	6.473	7.00	8.00	2.451	-0.475	-0.007
Comprehension	9.814	9.00	7.00	4.213	-0.659	0.236
Application	3.787	4.00	3.00	2.122	1.034	0.558
Analysis	2.036	2.00	2.00	1.345	0.565	0.568
Synthesis	1.932	2.00	2.00	1.344	0.223	0.654
Evaluation	1.876	2.00	2.00	1.266	1.202	0.639
Achievement in Social Sciences (Total)	25.918	25.00	21.00	8.356	-0.534	0.420

TABLE 4.2
Statistical Constants for the Distribution of Scores of Independent and Dependent Variables for Boys and Girls

VARIABLES	BOYS (N = 442)						GIRLS (N = 475)					
	Mean	Median	Mode	SD	Kurtosis	Skewness	Mean	Median	Mode	SD	Kurtosis	Skewness
INDEPENDENT VARIABLES												
Environmental	12.41	12.00	13.00	2.49	0.06	-0.08	12.30	12.00	12.00	2.37	0.26	-0.21
Emotional	13.54	14.00	13.00	2.40	-0.33	0.014	13.26	13.00	13.00	2.46	0.22	0.14
Sociological	9.08	9.00	8.00	2.10	12.01	1.35	8.74	9.00	9.00	1.86	1.12	-0.19
Physical	16.26	17.00	17.00	3.51	2.57	-1.08	16.77	17.00	17.00	3.13	2.92	-0.99
Learning Style (Total)	51.301	51.000	54.000	6.412	0.658	-0.215	51.08	51.00	52.00	6.037	3.544	-0.679
Meaning Orientation	8.13	8.00	8.00	2.36	-0.24	0.011	8.39	8.00	8.00	2.41	0.16	0.01
Reproducing Orientation	9.05	9.00	8.00	2.78	0.53	0.37	9.20	9.00	9.00	2.56	0.05	0.24
Achieving Orientation	9.55	10.00	10.00	2.36	0.63	0.12	9.58	10.00	10.00	2.46	0.65	-0.37
Non-Academic Orientation	8.58	8.00	8.00	2.50	1.13	0.38	8.91	9.00	9.00	2.39	-0.18	0.097
Approaches to Studying (Total)	35.314	35.000	35.00	6.793	1.330	0.677	36.08	36.00	36.00	6.553	0.596	0.459
Classroom Climate	75.443	76.00	82.00	13.922	-0.047	-0.333	80.773	82.00	86.00	12.801	0.702	-0.538
DEPENDENT VARIABLES												
Knowledge	6.136	6.00	7.00	2.587	-0.493	0.108	10.360	10.00	10.00	4.199	-0.675	0.098
Comprehension	9.226	9.00	7.00	4.154	-0.519	0.394	3.937	4.00	3.00	2.282	1.492	0.668
Application	3.627	3.00	3.00	1.925	-0.503	0.257	2.088	2.00	2.00	1.366	0.718	0.598
Analysis	1.980	2.00	2.00	1.322	0.371	0.523	2.156	2.00	2.00	1.413	0.036	0.596
Synthesis	1.692	2.00	1.00	1.222	0.221	0.620	1.822	2.00	2.00	1.244	0.738	0.568
Evaluation	1.869	2.00	2.00	1.29	1.653	0.71	6.787	7.00	8.00	2.276	-0.475	-0.044
Achievement in Social Sciences (Total)	24.529	23.00	21.00	8.145	-0.362	0.527	27.211	27.00	24.00	8.351	-0.630	0.338

TABLE 4.3
Statistical Constants for the Distribution of Scores of Independent and Dependent Variables for Rural and Urban Samples

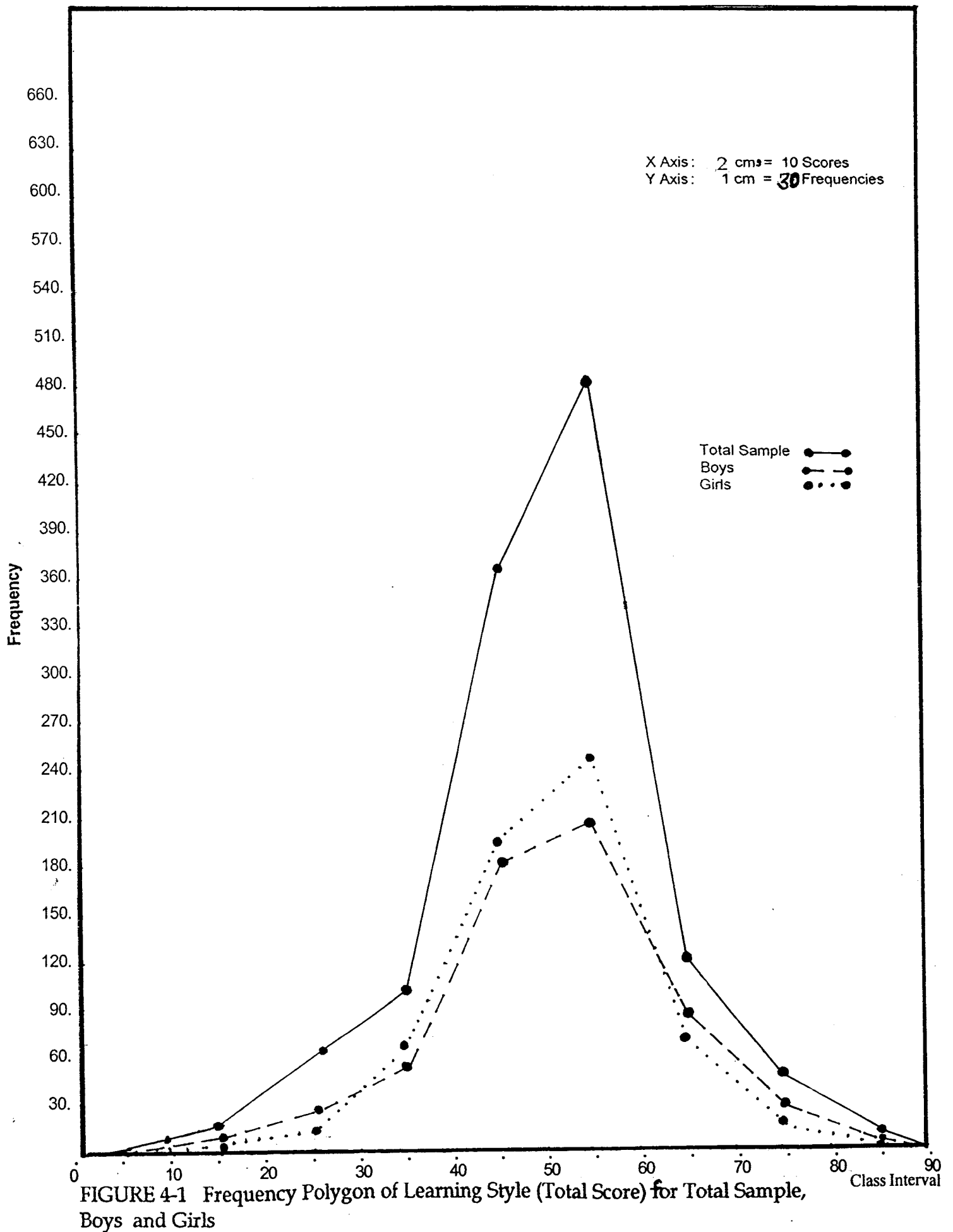
VARIABLES	RURAL (N = 611)						URBAN (N = 306)					
	Mean	Median	Mode	SD	Kurtosis	Skew-ness	Mean	Median	Mode	SD	Kurtosis	Skew-ness
INDEPENDENT VARIABLES												
Environmental	12.375	12.000	13.000	2.394	0.281	-0.287	12.314	12.000	12.000	2.513	-0.017	0.115
Emotional	13.403	13.000	13.000	2.513	-0.009	0.155	13.392	13.000	13.000	2.278	-0.273	-0.126
Sociological	9.005	9.000	8.000	2.070	9.711	0.778	8.709	9.000	9.000	1.797	0.894	0.391
Physical	16.655	17.000	17.000	3.460	3.665	-1.335	16.271	17.000	17.000	3.028	0.186	-0.336
Learning Style (Total)	51.43	52.00	52.00	6.52	2.48	-0.55	50.686	51.00	47.00	5.32	-0.031	-0.122
Meaning Orientation	8.223	8.000	8.000	2.470	-0.099	-0.009	8.343	8.000	8.000	2.233	0.074	0.093
Reproducing Orientation	8.953	9.000	8.000	2.614	0.539	0.365	9.474	9.000	8.000	2.745	0.056	0.167
Achieving Orientation	9.548	10.000	10.000	2.435	0.786	-0.305	9.611	10.000	8.000	2.372	0.273	0.188
Non-Academic Orientation	8.723	9.000	8.000	2.495	0.233	0.194	8.810	9.000	8.000	2.366	1.030	0.337
Approaches to Studying (Total)	35.447	35.00	33.00	6.718	0.925	0.541	36.239	36.00	37.00	6.57	0.980	0.623
Classroom Climate	77.984	80.00	86.00	13.29	0.539	-0.609	78.644	79.00	76.00	14.22	-0.286	-0.202
DEPENDENT VARIABLES												
Knowledge	6.157	6.00	5.00	2.370	-0.422	-0.032	7.105	7.00	7.00	2.492	-0.646	-0.051
Comprehension	9.514	9.00	7.00	4.149	-0.501	0.286	10.412	10.00	12.00	4.283	-0.903	0.128
Application	3.714	4.00	3.00	2.150	1.807	0.725	3.935	4.00	4.00	2.059	-0.609	0.204
Analysis	1.985	2.00	2.00	1.34	0.62	0.601	2.137	2.00	2.00	1.353	0.523	0.50
Synthesis	1.936	2.00	2.00	1.355	0.380	0.691	1.925	2.00	1.00	1.322	-0.113	0.576
Evaluation	1.918	2.00	2.00	1.279	0.377	0.484	1.791	2.00	2.00	1.237	3.277	0.979
Achievement in Social Sciences (Total)	25.224	24.00	24.00	8.297	-0.359	0.492	27.304	26.00	21.00	8.315	-0.790	0.301

TABLE 4.4
Statistical Constants for the Distribution of Scores of Independent and Dependent Variables for Government and Private Samples

VARIABLES	GOVERNMENT (N = 314)						PRIVATE (N = 603)					
	Mean	Median	Mode	SD	Kurtosis	Skew-ness	Mean	Median	Mode	SD	Kurtosis	Skew-ness
INDEPENDENT VARIABLES												
Environmental	12.42	12.00	12.00	2.36	-0.065	0.169	12.32	12.00	12.00	2.47	0.231	-0.28
Emotional	13.427	13.00	13.00	2.64	-0.497	0.174	13.38	13.00	13.00	2.33	0.247	0.002
Sociological	8.74	9.00	8.00	2.04	0.962	0.024	8.99	9.00	9.00	1.95	12.13	1.13
Physical	16.56	17.00	17.00	3.08	0.404	-0.552	16.51	17.00	17.00	3.44	3.53	-1.25
Learning Style (Total)	51.146	51.00	47.00	6.526	0.257	-0.228	51.207	51.00	52.00	6.057	3.192	-0.561
Meaning Orientation	7.97	8.00	8.00	2.24	0.51	-0.001	8.42	8.00	8.00	2.46	-0.07	-0.014
Reproducing Orientation	8.74	8.00	8.00	2.47	0.26	0.24	9.32	9.00	9.00	2.74	0.29	0.29
Achieving Orientation	9.47	10.00	10.00	2.29	0.32	-0.24	9.62	10.00	9.00	2.48	0.73	-0.12
Non-Academic Orientation	8.44	8.00	8.00	2.43	0.88	-0.15	8.91	9.00	9.00	2.45	0.25	0.28
Approaches to Studying (Total)	34.631	34.50	33.00	5.809	0.494	0.069	36.274	36.00	36.00	7.026	0.761	0.637
Classroom Climate	78.096	78.50	76.00	13.09	-0.053	-0.323	78.26	80.00	86.00	13.882	0.352	-0.507
DEPENDENT VARIABLES												
Knowledge	6.338	6.00	5.00	2.517	-0.589	0.105	6.544	7.00	6.00	2.416	-0.387	-0.066
Comprehension	9.481	9.00	10.00	4.232	-0.571	0.343	9.987	10.00	8.00	4.19	-0.680	0.183
Application	3.726	4.00	2.00	2.109	-0.198	0.435	3.819	4.00	4.00	2.129	1.652	0.621
Analysis	1.968	2.00	1.00	1.296	-0.389	0.414	2.071	2.00	2.00	1.370	0.932	0.625
Synthesis	2.054	2.00	2.00	1.345	0.181	0.567	1.869	2.00	1.00	1.34	0.285	0.706
Evaluation	1.908	2.00	2.00	1.226	2.553	0.743	1.859	2.00	2.00	1.28	0.634	0.598
Achievement in Social Sciences (Total)	25.475	24.00	21.00	8.434	-0.372	-0.519	26.00	25.00	24.00	8.313	-0.601	0.371

The mean, median and mode of Independent and Dependent Variables for Total sample and relevant Sub-samples are found to be nearly normal and the distribution is not badly skewed.

The distribution of scores were further examined graphically. For this, frequency polygon of test scores on Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate (Total Sample, Boys and Girls) and Dependent Variables viz., Achievement in Social Sciences (Total Sample, Boys and Girls) are presented in a superimposed format for enabling comparison in Figures 4-1, 4-2, 4-3 and 4-4.



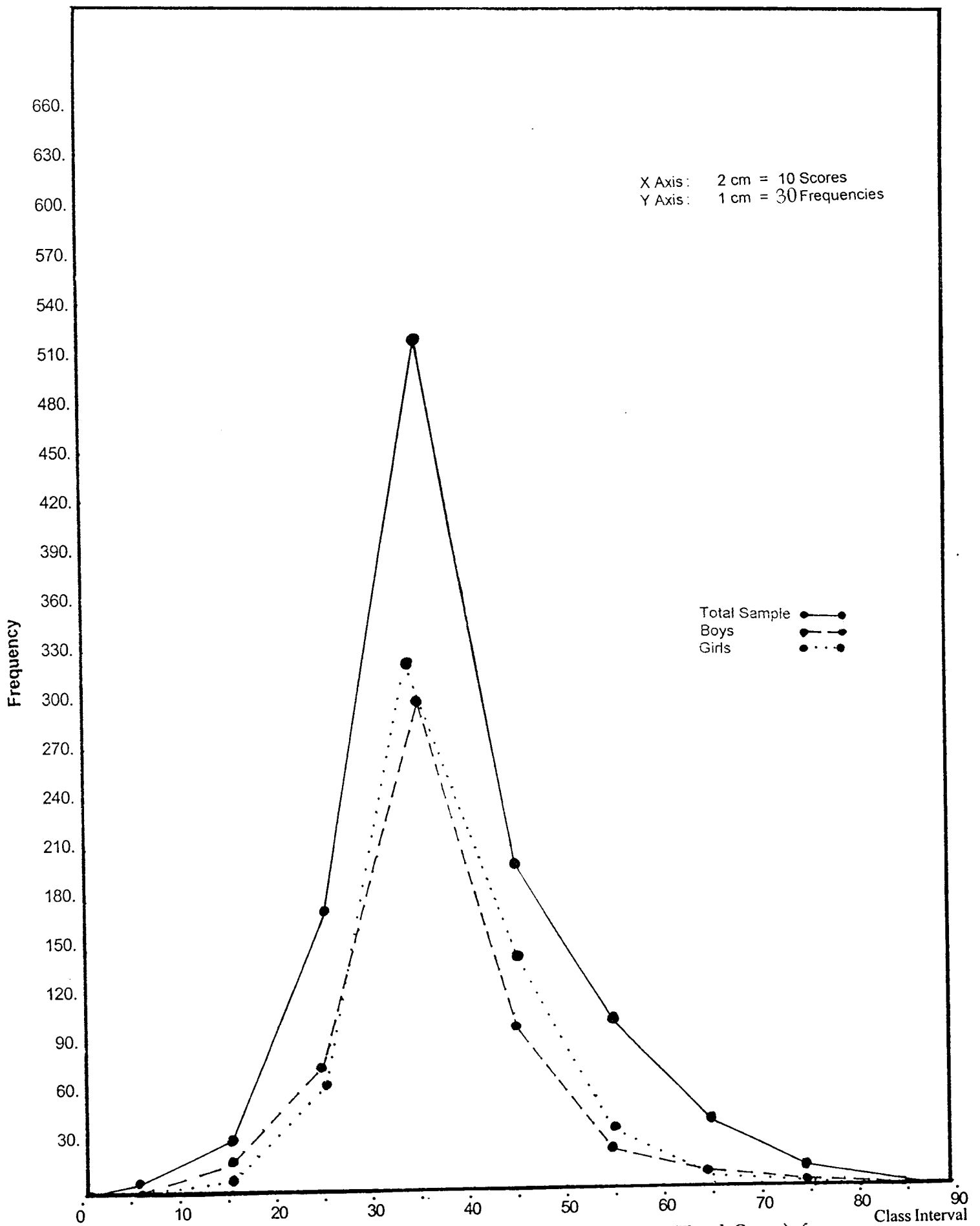


FIGURE 4-2 Frequency Polygon of Approaches to Studying (Total Score) for Total Sample, Boys and Girls

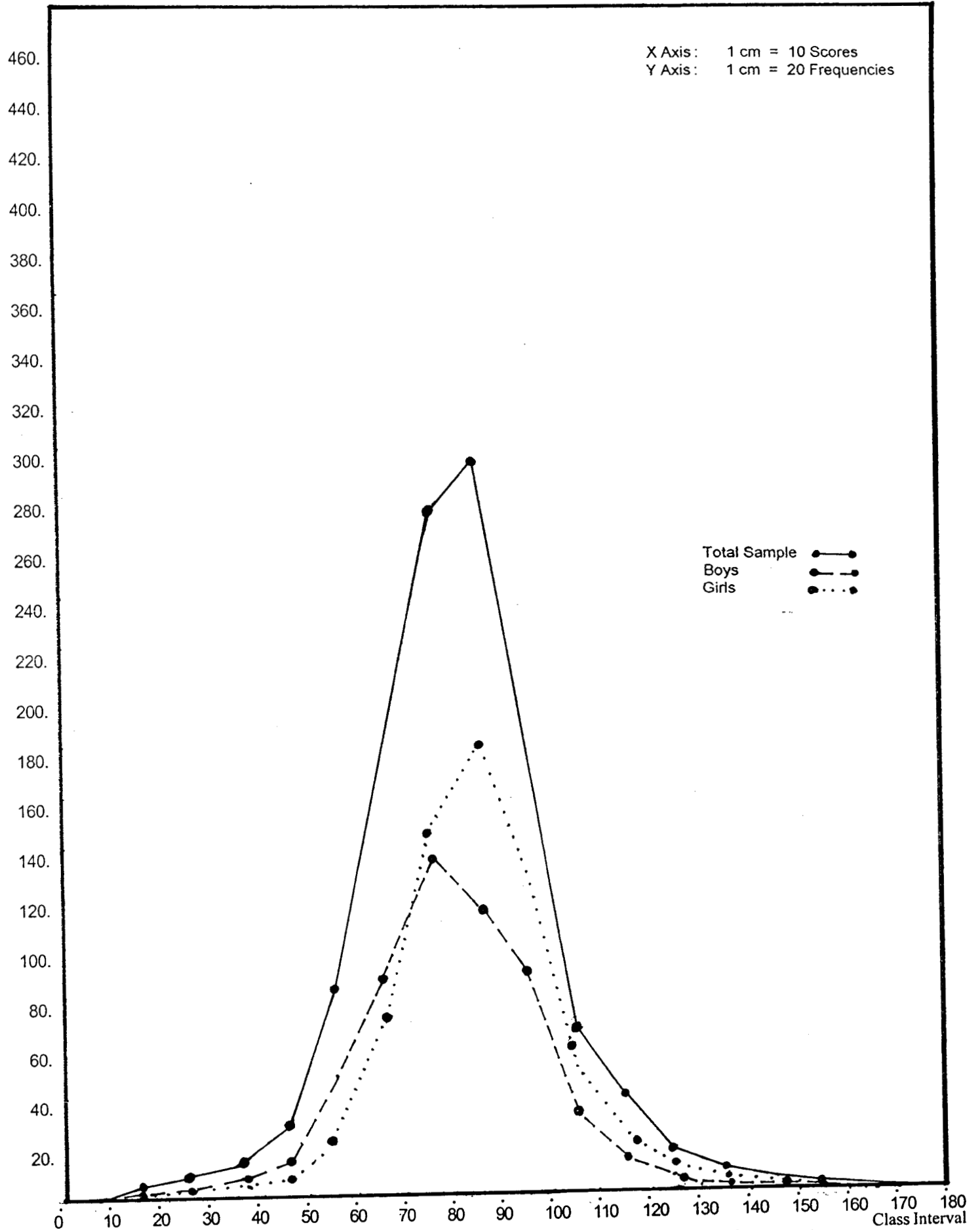


FIGURE 4-3 Frequency Polygon of Classroom Climate (Total Score) for Total Sample, Boys and Girls

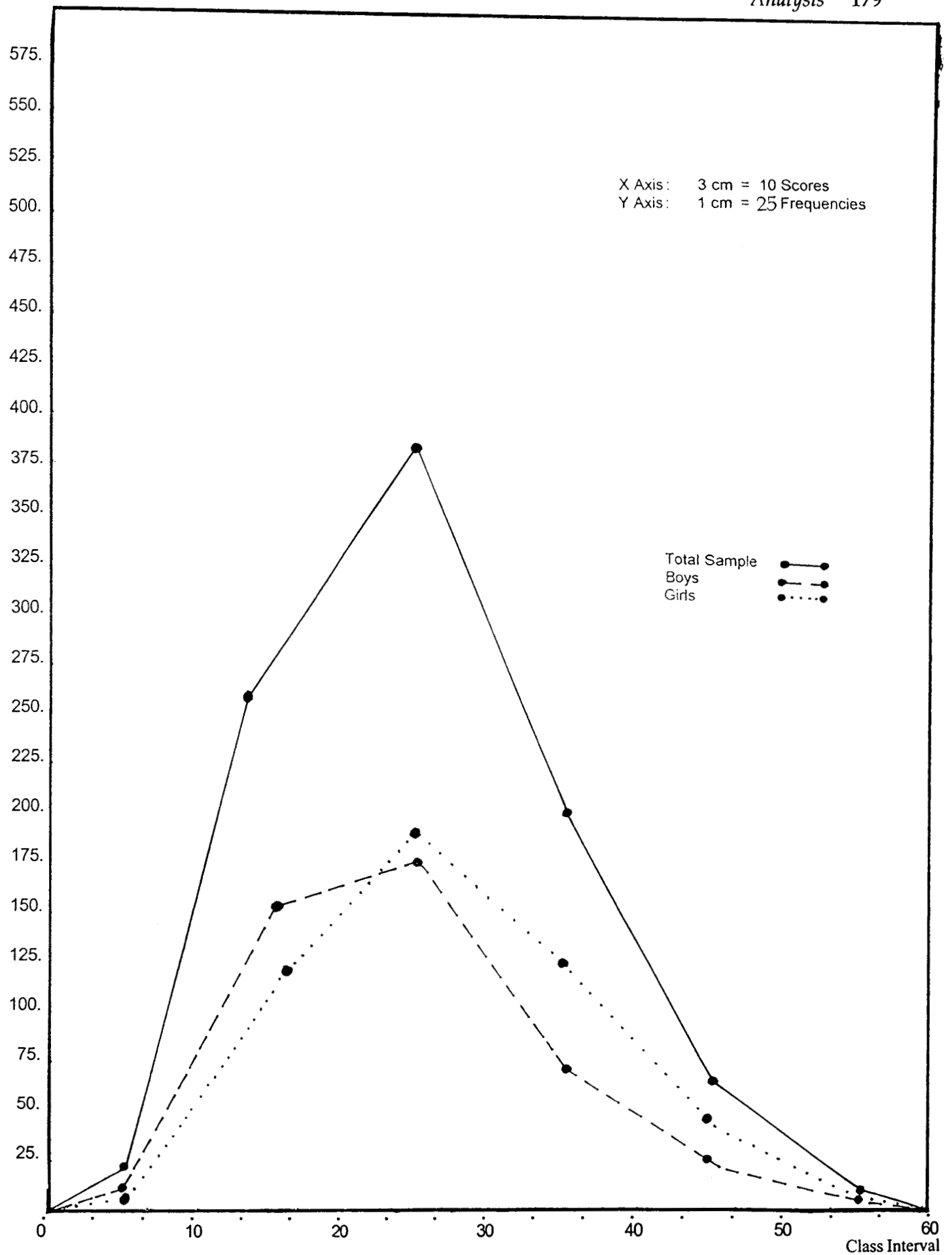


FIGURE 4-4 Frequency Polygon of Achievement in Social Sciences (Total Score) for Total Sample, Boys, and Girls

The graphical representation of Independent and Dependent Variables revealed that all the distributions approximated to normality. The near normal distributions indicated that the samples chosen for the study are fairly representative of the population.

4.1.1. Investigation of Sex Difference

As a continuation of preliminary analysis sex difference in the Independent and Dependent Variables for the Total Sample and Sub Samples based on Locale and Type of Management were examined.

For this purpose the means and standard deviations of the Independent Variables viz., *Learning Style* and *Approaches to Studying* (Component wise and Total Score) and *Classroom Climate* (Total Score) and Dependent Variables viz., *Achievement in Social Sciences* (Objective wise and Total Score) of Boys and Girls were subjected to two-tailed test of significance of difference between means.

4.1.1.1. Sex Difference in Independent Variables

Sex difference in *Learning Style*, *Approaches to Studying* and *Classroom Climate* is examined to understand how Boys and Girls differ with respect to the Independent Variables. The data and results of the t-test for the means of Independent Variables between Boys and Girls in the Total Sample, Rural and Urban, Government and Private Samples are presented in Table 4.5.

TABLE 4.5
Data and Results of the t-test for the means of
Independent Variables between Boys and Girls for Total Sample and Sub samples (Rural, Urban, Government and Private)

Independent Variables	TOTAL SAMPLE							RURAL							URBAN						
	BOYS			GIRLS			t	BOYS			GIRLS			t	BOYS			GIRLS			t
	M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂		M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂		M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂	
Environmental	12.41	2.49	442	12.30	2.37	475	0.69	12.55	2.44	276	12.23	2.35	335	1.64	12.18	2.58	166	12.47	2.43	140	1.01
Emotional	13.56	2.40	442	13.26	2.46	475	1.76	13.60	2.50	276	13.24	2.52	335	1.75	13.46	2.24	166	13.31	2.33	140	0.55
Social	9.10	2.10	442	8.47	1.87	475	2.57**	9.10	2.25	276	8.86	1.90	335	1.85	8.92	1.82	166	8.46	1.75	140	2.28*
Physical	16.26	3.51	442	16.77	3.13	475	2.32*	16.25	3.74	276	16.98	3.18	335	2.60**	16.28	3.11	166	16.26	2.94	140	0.08
Learning Style (Total)	51.30	6.41	442	51.08	6.04	475	0.54	51.57	6.92	276	51.32	6.18	335	0.47	50.84	5.43	166	50.5	5.65	140	0.54
Meaning Orientation	8.13	2.36	442	8.13	2.36	475	1.64	8.04	2.38	276	8.38	2.53	335	1.71	8.28	2.33	166	8.41	2.11	140	0.52
Reproducing Orientation	9.05	2.78	442	9.19	2.56	475	0.81	8.88	2.83	276	9.08	2.42	335	1.31	9.47	2.65	166	9.47	2.87	140	0.01
Achieving Orientation	9.55	2.36	442	9.58	2.45	475	0.18	9.50	2.35	276	9.58	2.51	335	0.41	9.64	2.40	166	9.58	2.34	140	0.22
Non-Academic Orientation	8.58	2.50	442	8.91	2.39	475	2.06*	8.51	2.54	276	8.90	2.44	335	1.91	8.69	2.44	166	8.95	2.27	140	0.95
Approaches to Studying (Total)	35.31	6.79	442	36.08	6.55	475	1.73	34.85	6.92	276	35.94	6.52	335	1.99*	36.09	6.52	166	36.44	6.52	140	0.43
Classroom Climate	75.44	13.92	442	80.77	12.8	475	6.02**	74.82	14.17	276	80.59	11.94	335	5.37**	76.48	13.70	166	81.21	14.70	140	2.92**

Independent Variables	GOVERNMENT							PRIVATE						
	BOYS			GIRLS			t	BOYS			GIRLS			t
	M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂		M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂	
Environmental	12.31	2.55	155	12.45	2.17	159	0.22	12.42	2.47	287	12.22	2.47	316	0.98
Emotional	13.73	2.67	155	13.12	2.58	159	2.06*	13.44	2.25	287	13.33	2.40	316	0.58
Social	8.96	2.05	155	8.51	2.01	159	1.94	9.15	2.12	287	8.86	1.78	316	1.80
Physical	16.52	3.27	155	16.60	2.91	159	0.25	16.12	3.63	287	16.85	3.23	316	2.60**
Learning Style (Total)	51.61	7.10	155	50.70	5.91	159	1.23	51.12	6.01	287	51.27	6.10	316	0.28
Meaning Orientation	8.08	2.27	155	7.85	2.21	159	0.90	8.15	2.42	287	8.65	2.47	316	2.52*
Reproducing Orientation	8.67	2.61	155	8.82	2.34	159	0.52	9.26	2.85	287	9.39	2.65	316	0.57
Achieving Orientation	9.28	2.37	155	9.66	2.19	159	1.46	9.70	2.35	287	9.54	2.58	316	0.78
Non-Academic Orientation	8.35	2.45	155	8.52	2.40	159	0.63	8.70	2.52	287	9.11	2.37	316	2.04*
Approaches to Studying (Total)	34.39	6.23	155	34.86	5.37	159	0.71	35.81	7.04	287	36.69	7.00	316	1.54
Classroom Climate	75.78	13.72	155	80.35	12.39	159	3.13**	75.26	14.21	287	80.99	13.02	316	5.14**

* P < 0.05; ** P < 0.01

4.1.1.1.(a) Sex Difference in Learning Style (Componentwise and Total Score)

Table 4.5 reveals that in Total Sample the t-values obtained for the components Social and Physical Style areas of the Independent Variable, Learning Style, significant mean differences reported between Boys and Girls. For the Social style area *significant mean difference* exist between Boys and Girls at 0.01 level ($t = 2.57$) showing the *comparative advantage of Boys* with high mean score over Girls. But in the Physical style area the mean difference is significant at 0.05 level ($t = 2.32$) indicating the *superiority of Girls* with high mean score over Boys. At the same time in the other two components – Environmental and Emotional and in Learning Style (Total Score) no significant difference exists, implying that the Boys and Girls are *similar in these areas of stylistic preferences*.

In the Rural sample, significant difference could be noticed only for the Physical Style area of Learning Style ($P < 0.01$, $t = 2.60$). The high mean score of Girls in this area over Boys indicates that they have *better stylistic preferences than Boys*. But no significant mean difference could be found in the Total score of Learning Style and the remaining three components of it, implying *similar stylistic preferences* between Boys and Girls.

The t-values obtained for Urban sample revealed that significant difference existed between Boys and Girls in the Social Stylistic area ($P < 0.05$; $t = 2.28$). The high mean score of Boys indicates that the *Urban Boys have better Social stylistic preferences* than Girls. But in the other three components and Learning Style (Total Score) there is no significant

difference between Boys and Girls showing the *similar stylistic preferences*.

For the Government sample the t-values obtained for comparison between Boys and Girls revealed that in Emotional style area ($t = 2.06$) the mean difference between Boys and Girls is *significant* ($P < 0.05$). As Boys have higher mean score they have better stylistic preferences than Girls in this area. The t-values revealed no significant difference in the components Environmental, Social and Physical and Learning Style (Total score) even at 0.05 level, indicating that stylistic preferences between *Boys and Girls are similar*.

For the comparison between Boys and Girls in Private schools the t-values revealed that in the Physical style area there exists significant difference at 0.01 level ($t = 2.60$). It shows that the Girls in Private schools with high mean score have *better preferences* than Boys in this style area. But no significant difference could be noticed for the remaining three components (Environmental, Emotional and Social) and Total score of Learning Style, implying *similarity in Learning style preferences*.

4.1.1.1.(b) Sex Difference in Approaches to Studying (Component wise and Total Score)

As per Table 4.5 in Total Sample among the four components of Approaches to Studying, only one component viz., Non-Academic Orientation marked significant difference in means at 0.05 level ($t = 2.06$). The higher mean score associated with Girls indicates their *superiority over Boys*. But the other three components and Approaches to Studying (Total

Score) marked no significant mean difference even at 0.05 level, showing that Boys and Girls are *identical in these areas of Approaches to Studying*.

When Approaches to Studying for Rural sample is compared, the t-value obtained for Rural Boys and Girls revealed *significant difference* in Approaches to Studying (Total Score) at 0.05 level ($t = 1.99$). The high mean score of Rural Girls implies that they have *superiority over Rural Boys* in their Approaches to Studying. At the same time the component wise mean scores of Boys and Girls in Approaches to Studying showed no significant difference indicating *similarity* between Rural Boys and Girls in the components of Approaches to Studying.

The mean scores of Urban Boys and Girls in Approaches to Studying (Component wise and Total Score) revealed *no significant difference* even at 0.05 level which implies that Urban Boys and Girls are *almost similar* in their Approaches to Studying.

The t-values obtained for Approaches to Studying (Component wise and Total Score) for Government sample also revealed that there is *no significant difference* between Boys and Girls even at 0.05 level. It shows that Boys and Girls in Government schools follow quite *similar pattern* in their Approaches to Studying.

The mean scores between Boys and Girls in Private schools revealed *significant differences* ($P < 0.05$) for two components of Approaches to Studying viz., Meaning Orientation ($t=2.52$) and Non-Academic Orientation ($t = 2.04$). In either components Girls have superiority with higher mean scores over Boys in study approaches. But in Meaning Orientation and

Achieving Orientation and in Approaches to Studying (Total Score) Boys and Girls have quite *similar approaches* as the mean scores in these areas are not significantly differentiated.

4.1.1.1.(c) Sex difference in Classroom Climate

Table 4.5 shows that while comparing Boys and Girls with regard to Classroom Climate, *significant differences* in means could be noticed in Total Sample and all Sub-samples. The differences between Boys and Girls in Total Sample ($t = 6.02$) and Sub-samples of Rural ($t = 5.37$), Urban ($t = 2.92$), Government ($t = 3.13$) and Private ($t = 5.14$) are at 0.01 level of significance. In all samples Girls obtained high mean scores indicating *better classroom perceptions of Girls than Boys*. Clear sex difference in Classroom Climate is observed in Total Sample and in all Sub-samples.

4.1.1.2. Sex Difference in Dependent Variables

Inorder to understand how Boys and Girls (Total Sample and relevant Sub-samples) differ in the Dependent Variable, Test of Significance of difference between means was executed.

The data and results of the t-test for the means of Dependent Variables between Boys and Girls are presented in Table 4.6.

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TABLE 4.6
Data and Results of the t-test for the means of Achievement in Social Sciences
(Objective wise and Total score) Between Boys and Girls for Total Sample and Sub-samples (Rural, Urban, Government and Private)

Dependent Variables	TOTAL SAMPLE							RURAL							URBAN						
	BOYS			GIRLS			t	BOYS			GIRLS			t	BOYS			GIRLS			t
	M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂		M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂		M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂	
Knowledge	6.14	2.59	442	6.79	2.28	4.75	4.04**	5.34	2.43	276	6.67	2.20	335	5.99**	7.13	2.54	166	7.07	2.44	140	0.21
Comprehension	9.23	4.15	442	10.36	4.19	475	4.11**	8.95	4.07	276	9.98	4.16	335	3.06**	9.68	4.25	166	11.28	4.16	140	3.31**
Application	3.63	1.93	442	3.94	2.82	475	2.23*	3.52	1.97	276	3.87	2.28	335	2.00*	3.79	1.84	166	4.10	2.28	140	1.27
Analysis	1.98	1.32	442	2.09	1.37	475	1.23	1.93	1.30	276	2.02	1.37	335	0.85	2.05	1.35	166	2.23	1.35	140	1.17
Synthesis	1.69	1.22	442	2.15	1.41	475	5.32**	1.68	1.23	276	2.15	1.42	335	4.40**	1.71	1.21	166	2.17	1.40	140	3.00**
Evaluation	1.87	1.29	442	1.88	1.24	475	0.16	1.85	1.28	276	1.97	1.28	335	1.17	1.89	1.31	166	1.66	1.13	140	1.67
Achievement in Social Sciences (Total)	24.53	8.14	442	27.21	8.35	475	4.92**	23.48	8.16	276	26.66	8.14	335	4.81**	26.27	7.84	166	28.52	8.72	140	2.35*

Dependent Variables	GOVT.							PRIVATE						
	BOYS			GIRLS			t	BOYS			GIRLS			t
	M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂		M ₁	σ ₁	N ₁	M ₂	σ ₂	N ₂	
Knowledge	5.69	2.50	155	6.97	2.37	159	4.64**	6.38	2.60	287	6.70	2.25	316	1.61
Comprehension	8.31	3.95	155	10.62	4.20	159	5.03**	9.72	4.18	287	10.23	4.20	316	1.48
Application	3.32	1.87	155	4.12	2.26	159	3.41**	3.79	1.94	287	3.84	2.30	316	0.31
Analysis	1.89	1.21	155	2.04	1.37	159	1.05	2.03	1.38	287	2.11	1.36	316	0.74
Synthesis	1.75	1.18	155	2.34	1.43	159	4.00**	1.66	1.24	287	2.06	1.40	316	3.74**
Evaluation	1.83	1.29	155	1.98	1.15	159	1.07	1.89	1.29	287	1.83	1.28	316	0.54
Achievement in Social Sciences (Total)	22.80	7.83	155	28.08	8.20	159	5.84**	25.46	8.17	287	26.77	8.40	316	1.94*

* P < 0.05; ** P < 0.01

Table 4.6 gives mean scores and standard deviations of Boys and Girls and corresponding t-values of Dependent Variables – Achievement in Social Sciences (Objective wise and Total score) for Total sample and Sub-samples.

4.1.1.2.(a) Sex Difference in Achievement in Social Sciences – Total Sample

The t-values obtained for Total Sample revealed that there exist *significant mean difference* between Boys and Girls in the objective wise scores of Knowledge ($t = 4.04$), Comprehension ($t = 4.11$) and Synthesis ($t = 5.32$) at 0.01 level and in Application ($t = 2.23$) at 0.05 level. In Achievement in Social Sciences (Total Score) also there exists *significant difference* at 0.01 level ($t = 4.92$). The mean scores found in these Dependent Variables show that *Girls have better performance* than Boys in Achievement in Social Sciences (Knowledge, Comprehension, Application and Synthesis and Total Score). At the same time in Total Sample *no significant mean difference* could be noticed for the objective wise scores in Analysis and Evaluation even at 0.05 level. Here Boys and Girls have identical performances.

4.1.1.2.(b) Sex Difference in Achievement in Social Sciences – Rural Sample

While comparing Rural Boys and Girls *significant mean differences* could be observed for the objective wise scores in Knowledge ($t = 5.99$), Comprehension ($t = 3.06$), Synthesis ($t = 4.40$) and in Total Score of Achievement in Social Sciences ($t = 4.81$) at 0.01 level and in Application ($t = 2.00$) at 0.05 level. The high mean score of Rural Girls indicate that they

are *superior* to Boys in Achievement in Social Sciences. But Rural Boys and Girls have almost identical performances in the objectives of Analysis and Evaluation as the mean scores are *not significantly different*.

4.1.1.2.(c) Sex Difference in Achievement in Social Sciences – Urban Sample

In the urban sample, the t-values obtained for the Dependent Variables revealed that *significant differences* exist for the objectives - Comprehension ($t = 3.31$) and Synthesis ($t = 3.00$) at 0.01 level and in Achievement in Social Sciences (Total Score) at 0.05 level ($t = 2.35$). The mean scores indicate that Girls in Urban areas also *excel in performance* over Boys in Social Sciences since higher means are attached with girls. However the t-values for the objectivewise scores in Knowledge, Application, Analysis and Evaluation for Urban Sample disclose that Boys and Girls are not significantly different even at 0.05 level, implying *similar attainment* in these objectives.

4.1.1.2.(d) Sex Difference in Achievement in Social Sciences – Government Sample

The t-values obtained while comparing Boys and Girls with regard to the objective wise and Total Achievement in Social Sciences in Government Schools showed *significant differences* at 0.01 level for the objectives - Knowledge ($t = 4.64$), Comprehension ($t = 5.03$), Application ($t = 3.41$), Synthesis ($t = 4.00$) and Total Score of Social Sciences ($t = 5.84$). The high mean score obtained by the Girls in Government schools reveal that they are superior to Boys in Achievement in Social Sciences. But no *significant*

difference could be observed in the objectives – Analysis and Evaluation even at 0.05 level showing almost identical performances for Boys and Girls.

4.1.1.2.(e) Sex Difference in Achievement in Social Sciences – Private Sample

For the comparison of Boys and Girls in Achievement in Social Sciences (Objectivewise and Total score) in the Private sample the t-values obtained show *significant mean difference* for the objective wise scores in Synthesis ($t = 3.74$, $P < 0.01$) and in Total Score of Achievement in Social Sciences ($t = 1.94$, $P < 0.05$). High mean score of Girls indicate their better performance than Boys in these areas. However *no significant mean difference* could be found for the other objectives – Knowledge, Comprehension, Application, Analysis and Evaluation. This indicate the *similar level of achievement* between Boys and Girls in these areas.

4.1.1.3. Concluding Remarks

The investigation of sex difference in Independent Variables and Dependent Variables revealed that Boys and Girls differ significantly in some of the components of the Independent and Dependent variables for Total sample and relevant Sub-samples. Table 4.7 presents the details of Independent and Dependent Variables where significant differences between Boys and Girls were found.

TABLE 4.7

**Details of Independent and Dependent Variables
showing Significant Mean Differences between Boys and Girls**

Variables	Total sample t-value	Rural sample t-value	Urban sample t-value	Govt. sample t-value	Private sample t-value
Independent Variables					
Emotional	--	--	--	2.06*	--
Social	2.57**	--	2.28*	--	--
Physical	2.32*	2.60**	--	--	2.60**
Meaning Orientation	--	--	--	--	2.52*
Non-Academic Orientation	2.06*	--	--	--	2.04*
Approaches to Studying (Total)	--	1.99*	--	--	--
Classroom Climate	6.02**	5.37**	2.92**	3.13**	5.14**
Dependent Variables					
Knowledge	4.04**	5.99**	--	4.64**	--
Comprehension	4.11**	3.06**	3.31**	5.03**	--
Application	2.23*	2.00*	--	3.41**	--
Synthesis	5.32**	4.40**	3.00**	4.00**	3.74**
Achievement in Social Sciences (Total)	4.92**	4.81**	2.35*	5.84**	1.94*

* P < 0.05

** P < 0.01

It is clear from Table 4.7 that in the Independent Variable, Learning Style, *Emotional Style area* has significant Sex difference for Government Sample only. The *Social Style area* significantly differentiates Total and

Urban Samples and *Physical area* also differentiated significantly for Total, Rural and Private Samples. Among the Components of Approaches to Studying Sex difference is found in *Meaning Orientation* for Private Sample, *Non-Academic Orientation* for Total and Private Sample and in *Approaches to Studying* (Total Score) for Rural sample only. But in Classroom Climate sex difference is noticed for Total Sample and all Sub-samples (Rural, Urban, Government and Private).

As a general tendency Girls obtained higher mean scores than Boys. It is an indication for Girls' superiority over Boys with respect to Learning Style, Approaches to Studying (Component wise and Total Score) and Classroom Climate.

However in Independent Variables viz., Environmental Style area, Learning Style (Total Score), Reproducing Orientation and Achieving Orientation significant mean difference could not be located at any level of comparison.

When sex difference in *Dependent Variables* were studied, it was found that the objective, *Synthesis* and *Achievement in Social Sciences* (*Total score*) significantly differentiated between Boys and Girls for all samples (Total, Rural, Urban, Government and Private). In the objective, *Knowledge* significant sex difference could be observed for Total, Rural and Government Samples, in *Comprehension* for Total, Rural, Urban and Government samples and in *Application* for Total, Rural and Government Samples.

In all the different levels of comparison between Boys and Girls in Dependent Variables Girls obtained *higher mean scores* than Boys. It indicates the total domination of Girls over Boys in Achievement in Social Sciences.

However for the objectives, *Analysis* and *Evaluation* no significant sex difference was reported for any sample. This shows that Boys and Girls in these areas are quite *similar*.

4.1.2. Identification of Learning Style Preferences

The investigator has made an attempt in this section to identify the *Learning Style Preferences* of pupils using mean and standard deviation. The mean scores along with the standard deviations obtained for the four components of Learning Style viz., Environmental, Emotional, Sociological and Physical are presented in Table 4.8 in decreasing order of magnitude for Total Sample and Sub samples viz., Boys, Girls, Rural, Urban, Government and Private.

TABLE 4.8
Mean and Standard Deviations of Components of Learning Style

Components of Learning Style	Total		Boys		Girls		Rural		Urban		Government		Private	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Physical	16.527	3.325	16.26	3.51	16.77	3.13	16.655	3.460	16.271	3.028	16.56	3.08	16.51	3.44
Emotional	13.399	2.436	13.54	2.40	13.26	2.46	13.403	2.513	13.392	2.278	13.427	2.64	13.38	2.33
Environmental	12.357	2.433	12.41	2.49	12.30	2.37	12.375	2.394	12.314	2.513	12.42	2.36	12.32	2.47
Sociological	8.906	1.987	9.08	2.10	8.74	1.86	9.005	2.070	8.709	1.797	8.74	2.04	8.99	1.95

It is evident from Table 4.8 that the preference for *Physical Style* area is the most preferred as the mean scores associated with it are high for all samples (Total - 16.527, Boys - 16.26, Girls - 16.77, Rural - 16.655, Urban - 16.271, Government - 16.56 and Private - 16.51). It is indicative of the fact that student Achievement can be improved by improving the elements contributing physical style area viz., Auditory (learning by listening/hearing), Visual (learning by watching/reading), Tactile (learning by hands-on e.g. note taking), Kinesthetic (learning by active involvement e.g. direct experience), Intake (eating, drinking to help concentration), Evening/ Morning (learning in the evening vs. morning), Late morning (learning in the late morning), Afternoon (learning in the afternoon) and Mobility (taking breaks vs. able to sit still for long periods).

This finding shows that pupils are following conventional and regular study habits and so there is a *need to rearrange the teaching-learning environment* in such a way as to support the Physical Style preference of pupils. Teachers are required to align their teaching strategies in tune with the Physical Style.

As the mean scores indicate preference for Physical Style area is followed by preference for *Emotional Style* area for all samples. It shows that the factors that constitute Emotional Style area viz., motivation (desire to achieve), persistence (engaging in a task until complete or take breaks), responsibility (conforming to expectations) and structure (specific directions vs. latitude) may be enhanced to facilitate high Achievement scores. Hence the system of education need to be reformulated to accommodate the supporting factors of Emotional Style area.

Next to Emotional Style high mean scores are reported by *Environmental Style* area for all samples. It reveals that the pupils who preferred this style area can improve their academic achievement if providing conducive environmental factors related to noise level (sound vs. quiet), light (bright vs. dim light), temperature (warm vs. cool environment) and design (informal [sofa, floor] vs. formal [table, chair] seating arrangement) which are the contributing factors of this style area.

Table 4.8 further shows that the fourth component of Learning Style viz., *Sociological Style* area obtained mean scores which are the lowest and so it indicates that this style area is not a significant component in constituting pupils' learning style preferences.

It can be concluded that the most and least preferred Learning Style areas for the total and relevant subsamples are Physical and Sociological Style areas.

4.1.3. Identification of Study Approaches

In order to identify the study approaches of pupils, the investigator studied the component wise means and standard deviations of Approaches to Studying viz., Meaning Orientation, Reproducing Orientation, Achieving Orientation and Non-Academic Orientation, which are presented in Table 4.9 in decreasing order of magnitude.

TABLE 4.9
Mean and Standard Deviations of Components of Approaches to Studying

Components of Approaches to Studying	Total		Boys		Girls		Rural		Urban		Government		Private	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Achieving Orientation	9.569	2.413	9.55	2.36	9.58	2.46	9.548	2.435	9.611	2.372	9.47	2.29	9.62	2.48
Reproducing Orientation	9.126	2.668	9.05	2.78	9.20	2.56	8.953	2.614	9.474	2.745	8.74	2.47	9.32	2.74
Non-Academic Orientation	8.752	2.451	8.58	2.50	8.91	2.39	8.723	2.495	8.810	2.366	8.44	2.43	8.91	2.45
Meaning Orientation	8.263	2.393	8.13	2.36	8.39	2.41	8.223	2.470	8.343	2.233	7.97	2.24	8.41	2.46

It is appeared from Table 4.9 that the *Achieving Orientation* is the most significant component of Approaches to Studying in forming study approaches as high mean scores are obtained by it in Total Sample and all Sub-samples (Total – 9.569, Boys – 9.55; Girls – 9.58, Rural – 9.548, Urban – 9.611, Government – 9.47 and Private – 9.62). It shows that the mode of study followed by pupils is highly imbued to the factors contributing Achieving Orientation viz., Strategic approach (aware of implications of academic demands made by staff), Disorganised study method (unable to work regularly and effectively), Negative attitude to studying (lack of interest in content matter and in the application) and Achievement motivation (showing confidence and highly competitive).

This result highlights the weakness of the current system of education in which pupils are guided and inspired by parents and teachers to follow achievement directed educational practices. So pupils take education as need based and efforts undertaken are directed by hope for success in life rather than meaningful and deep learning.

The mean scores reveal that as a continuation of Achieving Orientation, *Reproducing Orientation* is the next significant component of Approaches to Studying. This method is meant to serve the temporary goals of learner and guided by factors like surface approach (memorisation for reproducing), syllabus boundness (learning process is centred around the syllabus), fear of failure (pessimism and anxiety about academic outcome) and extrinsic motivation (interested in courses for the benefits they offer).

Like Achieving Orientation this method also does not provide a meaningful and deep learning and once again underlying the defective method of study followed by students. Because of the pressure and compulsions of teachers and parents students are seemed to learn in such a way as to meet the short term requirements.

The third significant component of Approaches to Studying as evident by the mean scores for all Samples as per Table 4.9 is *Non-Academic Orientation*. This component is formed on the basis of improvidence (over reliance on details), globetrotting (tendency to jump into conclusion), comprehension learning (map out subject area and think divergently) and operation learning (emphasize on facts and logical analysis) which are not treated as healthy and fruitful ways of learning.

Table 4.9 reveals that the component *Meaning Orientation* recorded least significance in study approaches of pupils. It shows that pupils are reluctant to adopt study methods with intrinsic motivation which lead to deep and comprehensive learning. As a matter of fact experts and educationists have advised to adopt Meaning Orientation as a vital and enriched method of learning. But it is observed that Meaning Orientation is least preferred by the sample. It necessitates a straight and steady shift in learning approach of students in favour of Meaning Orientation.

Thus it can be concluded that the most and least preferred study approaches (Achieving Orientation and Meaning Orientation) adopted by secondary school pupils are not conducive and effective to achieve meaningful and deep learning, but mechanical, goal directed and based on extrinsic motivation.

So a deliberate effort is required from the side of parents, teachers and educationists to reformulate the present system of education to enable children to adopt meaningful and deep study strategies which are required for their comprehensive and integrated personality make up.

4.2. MAJOR ANALYSIS

This part of the chapter is devoted for the detailed techniques of analysing the data. This is done with a view to investigate the *main* and *interaction* effects of the Independent Variables on the Dependent Variables. A comprehensive picture of the analysis is presented in the following part.

4.2.1. ANALYSIS OF VARIANCE FOR ACHIEVEMENT

Three-way *ANOVA* with 3x3x3 factorial design was employed as a major technique for analysing the data to find out the influence of Independent Variables viz., *Learning Style*, *Approaches to Studying* and *Classroom Climate* on Dependent Variables viz., *Achievement in Social Sciences* (Objective wise and Total Score) of Secondary School Pupils. It was done separately for the Total Sample and Sub-samples based on Sex, Locale and Type of Management of Schools.

Before proceeding on with ANOVA the investigator has checked whether assumptions of ANOVA have been followed as suggested by *Scheffe'* (1959), *Winer* (1971), *Hays* (1973), *Guilford* and *Fruchter* (1978) and *Fox* (1984) found to be reasonably satisfied.

4.2.1.1. Procedure for Classification

The following procedure has been adopted to classify the data on Independent Variables so as to facilitate the Three-way Analysis of Variance.

Classification of Independent variables into different levels using Three-way ANOVA was based on the following formula.

$$\text{Mean} \pm 1 \text{ SD}$$

4.2.1.1.a. Classification of Learning Style

Learning style has been classified into three levels as *Highly Preferred Learning Style (HPLS)*, *Moderately Preferred Learning Style (MPLS)* and *Less Preferred Learning Style (LPLS)*. For this the sample was divided into three groups, based on the scores of Learning Style using mean and standard deviation as cut off points.

In the present study for Total Sample pupils with scores above $M + 1SD$ were considered as HPLS ($M = 51.18$, $SD = 6.22$; HPLS -58 and above scores). These who got $M - 1SD$ were considered as LPLS group ($M = 51.18$, $SD = 6.22$; LPLS - 45 and below scores) and whose scores fall between $M - 1SD$ and $M + 1SD$ as MPLS group (MPLS - scores between 46 and 57).

For the Sub-sample Boys ($M=61.30$, $SD = 6.41$) score for HPLS was 68 and above for LPLS 55 and below and for MPLS scores between 56 and 67. For Girls ($M = 61.98$, $SD = 6.03$) HPLS group was those pupils who scored 67 and above LPLS 55 and below and MPLS scores between 56 and 66. For

Rural sample ($M=51.43$, $SD = 6.52$) HPLS was 58 and above scores, LPLS 45 and below scores and MPLS scores between 46 and 57. In the case of Urban sample ($M = 50.68$, $SD - 5.52$) HPLS group belongs to scores 56 and above LPLS group 45 and below scores and MPLS scores between 46 and 55. For Govt. sample ($M = 51.14$, $SD = 6.52$) HPLS was 58 and above scores LPLS 45 and below scores and MPLS scores between 46 and 57. For Private sample ($M = 51.20$, $SD = 6.05$) HPLS belongs to scores 57 and above LPLS 45 and below and for MPLS scores between 46 and 56.

The actual number of subjects falling under each group categorised on the basis of Learning Style for Total Sample and Sub-samples are as follows.

Sample	HPLS	MPLS	LPLS	Total
Total	155	637	125	917
Boys	74	304	64	442
Girls	81	333	61	475
Rural	92	442	77	611
Urban	65	193	48	306
Govt.	53	217	44	314
Private	102	420	81	603

HPLS : Highly Preferred Learning Style

MPLS : Moderately Preferred Learning Style

LPLS : Less Preferred Learning Style

4.2.1.1.b. Classification of Approaches to Studying

Approaches to Studying has also been classified into three levels by the same procedure. They are *Highly Desirable Approaches to Studying (HDAS)*, *Moderately Desirable Approaches to Studying (MDAS)* and *Less Desirable Approaches to Studying (LDAS)*. For Total sample, Pupils whose

scores are above $M + 1SD$ were classified as HDAS ($M = 35.71$, $SD = 6.68$; HDAS - 42 and above scores), below $M - 1SD$ as LDAS ($M = 35.71$, $SD = 6.68$; LDAS 29 and below scores) and between $M - 1SD$ and $M + 1SD$ as MDAS group (MDAS - scores between 30 and 41).

For the Sub sample Boys ($M = 35.31$, $SD = 6.79$) HDAS group belongs to 42 and above scores, LDAS 29 and below scores and MDAS scores between 30 and 41. In the case of Girls ($M = 36.08$, $SD = 6.55$) HDAS was scores 43 and above, LDAS 30 and below and MDAS scores between 41 and 42. For Rural sample ($M = 35.44$, $SD = 6.71$), HDAS group was scores 42 and above, LDAS 29 and below and MDAS scores between 30 and 41. For Urban sample ($M = 36.23$, $SD = 6.57$) HDAS was scores 43 and above, LDAS 30 and below and MDAS scores between 31 and 42. With regard to Government sample ($M = 34.63$, $SD = 5.80$) HDAS group belongs to scores 40 and above LDAS 29 and below and MDAS scores between 30 and 39. Finally for Private sample ($M = 36.27$, $SD = 7.02$) HDAS group was scores 43 and above, LDAS 29 and below and MDAS scores between 30 and 42.

The actual number of students falling under the categories of Approaches to Studying in the Total sample and Sub-samples are presented as follows.

Sample	HDAS	MDAS	LDAS	Total
Total	132	163	172	917
Boys	64	297	81	442
Girls	68	316	91	475
Rural	101	408	102	611
Urban	45	205	56	306
Govt.	62	197	55	314
Private	70	441	92	603

HDAS : Highly Desirable, Approaches to Studying
 MDAS : Moderately Desirable Approaches to Studying
 LDAS : Less Desirable Approaches to Studying

4.2.1.1.c. Classification of Classroom Climate

There are three levels for Classroom Climate also. They are *Highly Favourable Classroom Climate (HFCC)*, *Moderately Favourable Classroom Climate (MFCC)* and *Less Favourable Classroom Climate (LFCC)*. For Total sample pupils who scored above $M + 1SD$ were categorised into HFCC group ($M = 66.38$, $SD = 10.33$; HFCC - 77 and above scores) below $M - 1SD$ into LFCC group ($M = 66.38$, $SD = 10.33$; LFCC - 64 and below scores) and between $M - 1SD$ and $M + 1SD$ into MFCC group (scores between 65 and 76).

In the case of the Sub-sample Boys ($M = 75.43$, $SD = 13.92$) the group HFCC belongs to scores 89 and above, LFCC 62 and below and MFCC

scores between 63 and 88. For Girls ($M = 80.77$, $SD = 12.80$) HFCC was 93 and above scores, LFCC 68 and below scores and MFCC scores between 69 and 92. The HFCC group for the Rural Sample ($M = 77.98$, $SD = 13.29$) belongs to scores 91 and above, LFCC 65 and below and MFCC between 66 and 90. In Urban sample ($M = 78.64$, $SD = 14.22$) HFCC was scores 93 and above LFCC 64 and below and for MFCC between 65 and 92. For Government sample ($M = 78.09$, $SD = 13.09$) HFCC group belongs to scores 91 and above, LFCC 65 and below and MFCC between 66 and 90. For Private sample ($M = 78.29$, $SD = 13.88$) HFCC was scores 92 and above, LFCC scores 64 and below and for MFCC scores between 65 and 91.

The actual sample size coming under each category on the basis of Classroom Climate in the Total sample and Sub-samples are as follows.

Sample	HFCC	MFCC	LFCC	Total
Total	157	602	158	917
Boys	83	275	84	442
Girls	74	327	74	475
Rural	100	406	105	611
Urban	58	197	51	306
Govt.	60	203	51	314
Private	100	408	95	603

HFCC : Highly Favourable, Classroom Climate
 MFCC : Moderately Favourable Classroom Climate
 LDAS : Less Favourable Classroom Climate

Three-way ANOVA with 3x3x3 factorial design holds *three levels* of Learning Style, *three levels* of Approaches to studying and *three levels* of

Classroom Climate. For the application of ANOVA the computer programme, Statistical Package for Social Sciences - SPSS (Lewis-Beck, 1984) was made use of. Due to the unequal number of cases in the treatment cells, the programme for unequal numbers was used for processing the data. Three-way ANOVA facilitated the Two-way and Three-way interaction effects so as to find out the influence of Independent Variables on Dependent Variables.

Seven ANOVA are undertaken to study the main effect, Two-way and Three-way interactions of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) for Total Sample, Boys, Girls, Rural, Urban, Government and Private Samples. Altogether **49 ANOVA** were executed to process the data.

4.2.3. Analysis of Variance for Achievement in Social Sciences (Objectivewise and Total Score) for Total Sample (N=917)

Three-way ANOVA was utilised, taking the sum of squares along with their degrees of freedom, the mean square of variance and the corresponding F-ratios. The table value of F-ratios ascertained the significance of the main effect, two-way and three-way interactions.

Summary of Three-way ANOVA for Total Sample is presented in Table 4.10.

TABLE 4.10

**Summary of Three-way ANOVA
for Achievement in Social Sciences (Objective wise
and Total Score) By Learning Style By Approaches to
Studying By Classroom Climate for Total Sample (N = 917)**

Dependent Variable	Sources of Variation	Main Effects			Two-way interaction			Three-way interaction
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
KNOWLEDGE	SS	8.86	82.50	0.41	11.06	30.01	23.80	38.87
	df	2	2	2	4	4	4	8
	MS	4.43	41.25	0.21	2.77	7.50	5.95	4.86
	F	0.769	7.155**	0.036	0.480	1.301	1.032	0.843
COMPREHENSION	SS	76.80	73.40	29.23	15.98	12.08	17.57	156.65
	df	2	2	2	4	4	4	8
	MS	38.40	36.70	14.61	3.99	3.02	4.39	19.58
	F	2.228	2.200	0.848	0.232	0.175	0.255	1.136
APPLICATION	SS	13.56	45.47	0.572	8.04	3.83	11.51	22.71
	df	2	2	2	4	4	4	8
	MS	6.78	22.73	0.28	2.01	0.96	2.88	2.84
	F	1.531	5.134**	0.065	0.454	0.216	0.65	0.641
ANALYSIS	SS	0.07	3.85	3.33	14.78	4.43	19.97	18.23
	df	2	2	2	4	4	4	8
	MS	0.09	1.92	1.66	3.69	1.11	4.99	2.28
	F	0.004	1.078	0.93	2.07	0.62	2.799*	1.278
SYNTHESIS	SS	3.72	3.83	0.001	5.70	8.75	5.54	7.46
	df	2	2	2	4	4	4	8
	MS	1.86	1.92	0.00	1.42	2.19	1.39	0.93
	F	1.024	1.055	0.000	0.784	1.204	0.762	0.513
EVALUATION	SS	4.13	8.20	3.90	4.36	2.05	5.68	9.36
	df	2	2	2	4	4	4	8
	MS	2.07	4.10	1.95	1.09	0.513	1.42	1.17
	F	1.283	2.546	1.211	0.677	0.319	0.883	0.727
ACHIEVEMENT IN SOCIAL SCIENCES (Total Score)	SS	320.79	482.06	33.30	41.04	127.00	30.54	417.07
	df	2	2	2	4	4	4	8
	MS	160.40	241.03	16.06	10.26	31.75	7.64	52.13
	F	2.385	3.584*	0.247	0.153	0.47	0.114	0.775

LS - Learning Style; AS - Approaches to Studying; CC - Classroom Climate

* $P < 0.05$; ** $p < 0.01$

4.2.3.1. Main Effect of Independent Variables

Using the Three-way ANOVA, the investigator examined the main effects of the three Independent Variables separately on the Dependent Variables. This will help to find out whether variation in the Dependent Variables (Objective wise and Total Score) be attributable to changes in any level of the Independent Variables.

Main Effect of Learning Style

As per Table 4.10 the F-values obtained for the main effects of Learning Style on Achievement in Social Sciences (Objective wise and Total Score) for Total Sample were found to be below the table value (3.02) for df 2,890. It shows that the main effect of Learning Style is not significant on Achievement in six objective wise scores and Total Score on Social Sciences. It is indicative of the fact that Achievement in Social Sciences (Objective-wise and Total Score) is *Independent of the changes* in the levels of Learning Style.

Main Effect of Approaches to Studying

Table 4.10 reveals that the F-ratios obtained for the main effect of Approaches to Studying was found to be significant on the objective-wise achievement in Knowledge ($F = 7.155$, $df = 2,890$, table value - 4.62, $p < 0.01$), Application ($F = 5.134$, $df = 2,890$, table value - 4.62, $p < 0.01$) and Total achievement in Social Sciences ($F = 3.584$, $df = 2,890$, table value - 3.02, $P < 0.05$). It can be noted from the results that the *Achievement in Social Sciences* (Knowledge, Application and Total Score) *changes when* the levels of *Approaches to Studying Change*.

It can also be observed from Table 4.10 that the main effect of Approaches to studying on the objective wise achievement in Social Sciences - Comprehension ($F = 2.20$), Analysis ($F = 1.078$), Synthesis ($F = 1.055$) and Evaluation ($F = 2.546$) is found to be *not significant* even at 0.05 level. The corresponding F-values are below the table value assigned for significance even at 0.05 level. It can be inferred that Achievement in these objectives is *not changeable* when the levels of *Approaches to Studying* undergo a change.

Main Effect of Classroom Climate

Table 4.10 further reveals that the F-values obtained for the main effects of Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) are below the table value (3.02) for the df 2, 890. Thus it implies that the main effect of Classroom Climate is not significant even at 0.05 level, showing that the *variation in Achievement in Social Sciences (Objective wise and Total Score) is not attributable to variations in the levels of Classroom Climate*.

4.2.3.2. Two-way Interactions

Three Two-way interactions were examined by the Three-way factorial ANOVA (Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate) on Achievement in Social Sciences (Objective wise and Total Score) for Total Sample.

No significant interaction effect of Learning Style x Approaches to Studying and Learning Style x Classroom Climate on Achievement in Social

Sciences (Objective wise and Total Score) even at 0.05 level is found. The obtained F-values were found below the tabled value fixed for significance even at 0.05 level (Table value = 2.39, df = 4, 890).

Significant interaction F-ratio was obtained for the variables Approaches to Studying x Classroom Climate on the objective wise achievement in Analysis (F = 2.799, df = 4,890, Table value - 2.39). This is indicative of the fact that Achievement in the objective Analysis is subjected to a change when the variables Approaches to Studying and Classroom Climate Influence in Combination.

On all the other objectives viz., Knowledge, Comprehension, Application, Synthesis and Evaluation and Total Achievement in Social Sciences no significant interaction effect of Approaches to Studying x Classroom Climate is observed. It is assumed that the Achievement in these objectives is *independent of the combined effect of Approaches to Studying and Classroom Climate*.

4.2.3.3. Three-way Interaction

The Three-way interaction effect of Learning Style x Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total score) was studied through the 3 x 3 x 3 factorial ANOVA. It is found that *no significant* F-ratio was obtained for the interaction effect of the Variables Learning Style x Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) for Total Sample. All the F-ratios were found to be below the tabled value for significance at 0.05 level (Table value - 1.96, df - 8,890).

From the result it is evident that *variation in Achievement in Social Sciences* (Objective wise and Total Score) for the Total Sample is *independent of the combined effect of the variables Learning Style x Approaches to Studying x Classroom Climate*.

4.2.3.4. Graphical Representation of Interactions in Total Sample

An attempt has been made by the investigator to study the pattern of relationship of Independent Variables with Dependent Variables graphically. On the graphs the Dependent Variables, *Achievement in Social Sciences* (Objective wise and Total Score) have been plotted as the ordinate and the *three levels of classroom climate* - HFCC, MFCC and LFCC as the abscissa. *The three levels of Approaches to Studying* - HDAS, MDAS and LDAS are represented as lines on the graphs and the *three levels of Learning Style* - HPLS, MPLS and LPLS were treated as the background of the graph. The graphical representation is presented in Figures 4-5, 4-6 and 4-7.

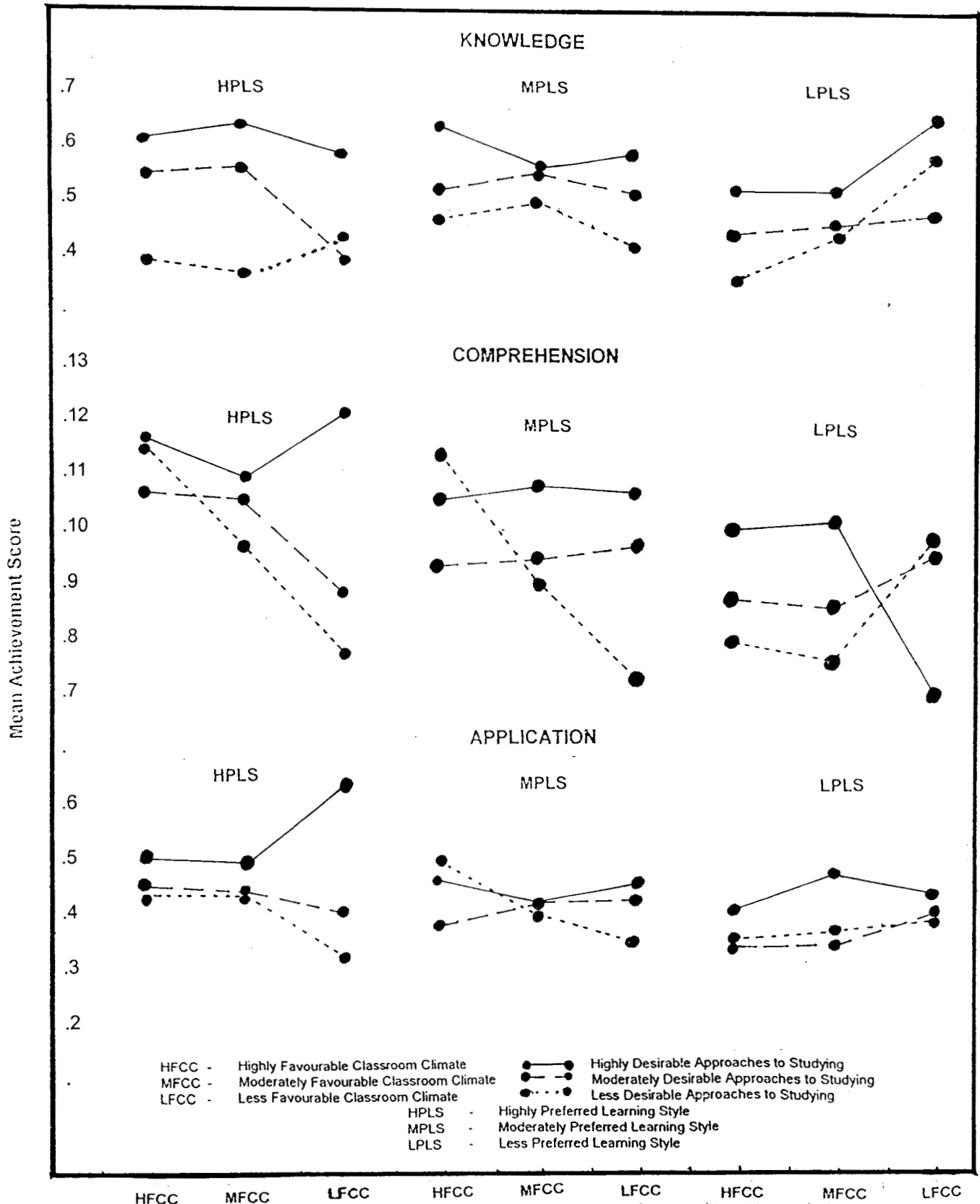


FIGURE 4-5 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Knowledge, Comprehension and Application) for Total Sample

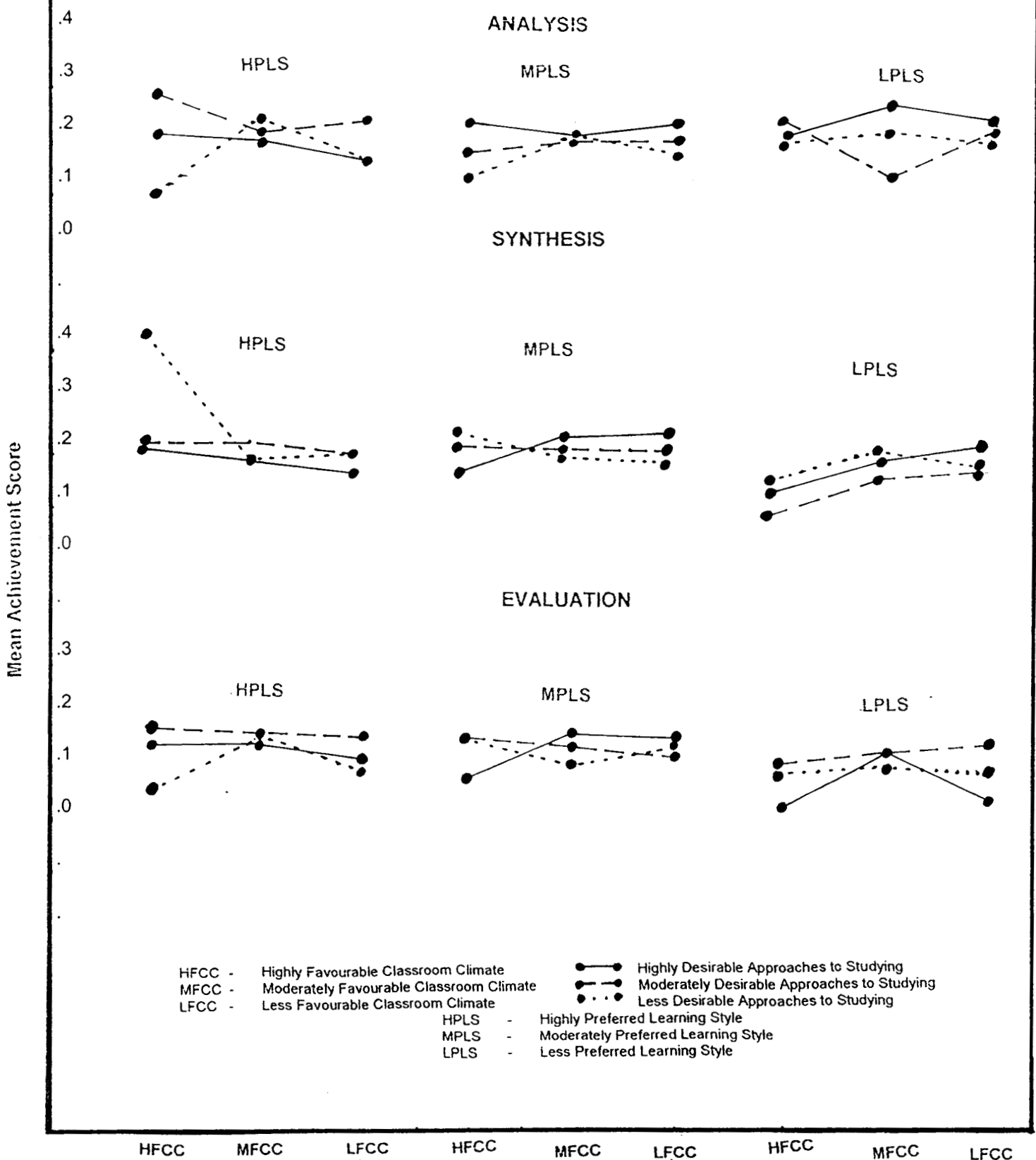


FIGURE 4-6 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Analysis, Synthesis and Evaluation) for Total Sample

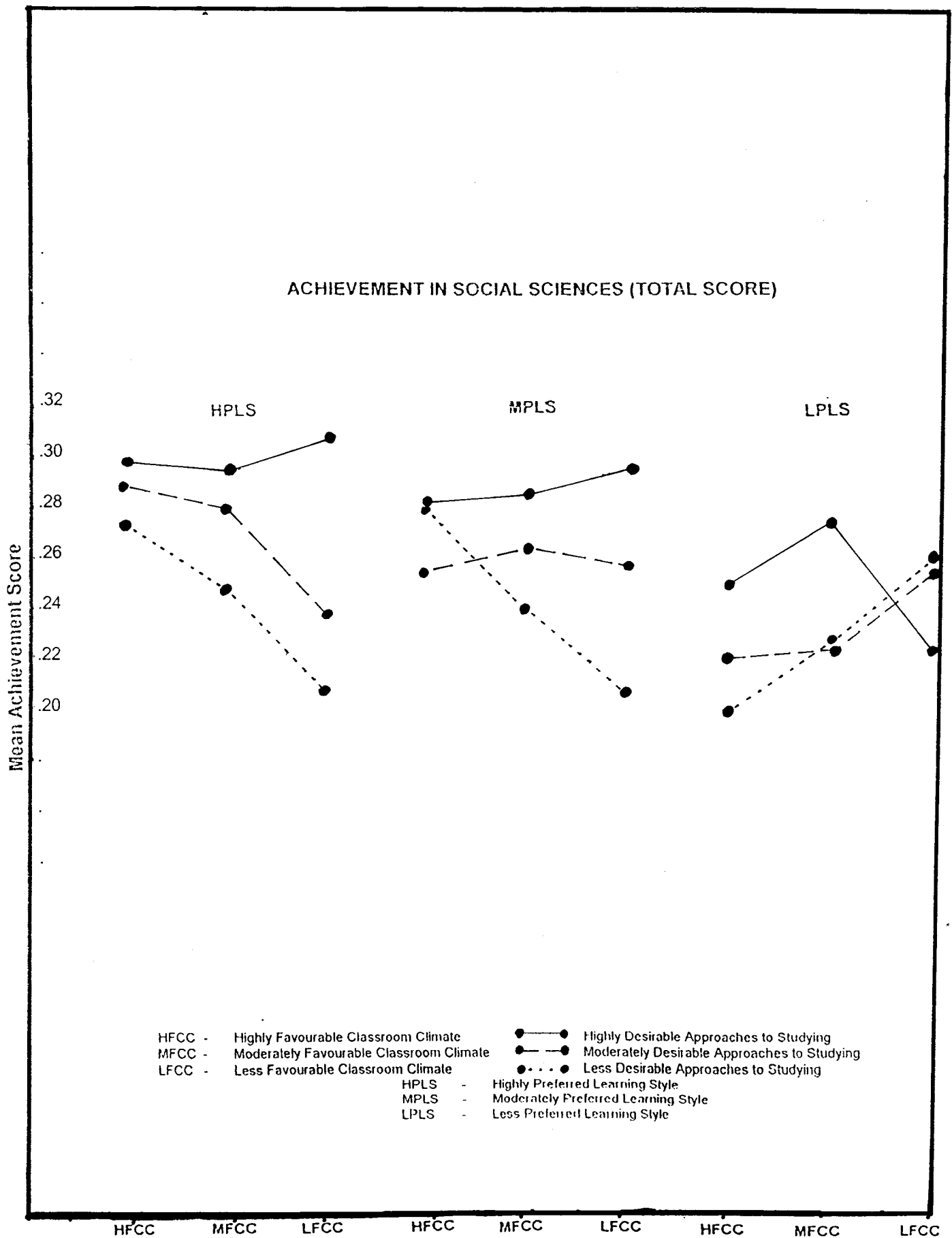


FIGURE 4-7 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Total Score) for Total Sample

Figure 4-5 shows the pattern of interaction of Independent Variables on objective wise achievement in Knowledge, Comprehension and Application. In Knowledge higher level of achievement is visible for HDAS pupils. In HPLS they were benefitted by MFCC, in MPLS by HFCC and in LPLS by LFCC. The MDAS pupils obtained higher achievement scores with MFCC in HPLS and MPLS.

In comprehension HDAS pupils obtained higher scores with MFCC when preferred MPLS and LPLS. For MDAS pupils better performance is visible with LFCC for MPLS and LPLS pupils. In HPLS and MPLS higher performance could be found for LDAS pupils with HFCC.

In the objective Application HDAS pupils received high achievement scores, but is contributed differently by the three levels of Classroom Climate in HPLS, MPLS and LPLS. For the MDAS pupils higher level of achievement is offered by LFCC and for LDAS pupils by HFCC.

The graphical representation of the objectives Analysis, Synthesis and Evaluation are presented in Figure 4-6. In Analysis higher level of achievement is visible for HDAS pupils in HPLS and MPLS. The MDAS pupils were benefitted by HFCC in HPLS and LPLS. But MFCC with LDAS caused higher achievement scores at all the three levels of Learning Style.

In synthesis the achievement scores of HDAS pupils are high with LFCC in MPLS and LPLS groups. MDAS pupils showed moderate - performances in HPLS and MPLS. But HFCC favoured LDAS pupils in HPLS and MPLS to achieve higher scores.

In the objective Evaluation MFCC contributed higher achievement scores for HDAS pupils in all the three levels of Learning Style. But HFCC has a comparative advantage with MDAS for higher performance in HPLS and MPLS.

Figure 4-7 shows the graphical representation of Achievement in Social Sciences (Total score). The level of achievement is high for HDAS pupils with LFCC in HPLS and MPLS. The graph did not show a *common pattern* for pupils who preferred MDAS. But HFCC favoured LDAS pupils for better performance in HPLS and MPLS.

The graphical representation of interaction of Independent variables on Achievement in Social Sciences (Objective wise and Total Score) show varying patterns across different objectives. However the general trend reveals that higher level of achievement is associated with Highly Preferred Learning Style, Highly Desirable Approaches to Studying and Highly Favourable Classroom Climate.

4.2.3.5. *Post-hoc Comparison of Group Means*

This section deals with the post-hoc comparison of means of relevant groups for which the Independent Variables have a *significant main effect* on Achievement in Social Sciences (Objective wise and Total Score). This is done with a view to find out exactly which levels of the Independent Variables create a change in the Dependent Variables.

Three-way ANOVA for Total Sample revealed that among the three Independent Variables only **Approaches to Studying** yielded a significant main effect on the Dependent Variables - Achievement in Knowledge

($P < 0.01$), Application ($P < 0.01$) and Social Science (Total score - $P < 0.05$). Scheffe' test of Post-hoc comparison (Ferguson, 1976) was used for comparing relevant groups based on Approaches to Studying.

The F-ratios between pairs of means were calculated using the within group variance. Table for F-values was consulted to obtain the value of F-required for significance at 0.05 and 0.01 level for $df_1 = (K-1)$ and $df_2 = (N-K)$ for the Total Sample and Sub-samples separately. Using the formula $F^1 = (K-1) F$, the quantity of F^1 for the required df was also calculated. The values of F were compared with the values of F^1 to decide the significance of the difference between the means.

F-ratios between pairs of means of Achievement in Social Sciences for the objectives - *Knowledge, Application* and *Total Achievement in Social Sciences* for three levels of Approaches to Studying were computed in the order of HDAS-MDAS, HDAS-LDAS and MDAS-LDAS.

Results of the post-hoc comparison are summarised in Table 4.11.

TABLE 4.11

**Results of Scheffe' Test of Post -hoc
Comparison Between Means of Achievement in
Social Sciences (Objective wise and Total Score) Based
on Three Groups of Approaches to Studying for Total Sample (N = 917)**

Dependent Variable	Groups Compared	Means		F	Values of F ¹		Level of Significance
		M ₁	M ₂		0.05	0.01	
Knowledge	HDAS - MDAS	7.22	6.47	2.8	6.00	9.24	NS
	HDAS - LDAS	7.22	5.71	29.46	6.00	9.24	0.01
	MDAS - LDAS	6.47	5.71	12.02	6.00	9.24	0.01
Application	HDAS - MDAS	4.35	3.72	10.83	6.00	9.24	0.01
	HDAS - LDAS	4.35	3.46	13.42	6.00	9.24	0.01
	MDAS - LDAS	3.72	3.46	1.83	6.00	9.24	NS
Achievement in Social Sciences (Total Score)	HDAS - MDAS	28.5	25.85	13.18	6.00	9.24	0.01
	HDAS - LDAS	28.5	23.53	1.07	6.00	9.24	NS
	MDAS - LDAS	25.85	23.53	9.47	6.00	9.24	0.01

HDAS - Highly Desirable Approaches to Studying

MDAS - Moderately Desirable Approaches to Studying

LDAS - Less Desirable Approaches to Studying

NS - Not Significant

Table 4.11 reveals that when the mean achievement scores in the objective Knowledge were compared the pairs HDAS - LDAS ($F = 29.46$) and MDAS - LDAS ($F = 12.02$) showed significant mean differences ($P < 0.01$) as the corresponding F-values are greater than the value of F' required for significance.

In the objective Application significant mean difference ($P < 0.01$) is found between the groups HDAS - MDAS ($F = 10.83$) and HDAS - LDAS

($F = 13.42$). The mean achievement scores in social sciences (Total Score) when compared the groups HDAS - MDAS ($F = 13.18$) and MDAS - LDAS (9.47) yielded significant group differences ($P < 0.01$).

The results of Post-hoc comparison for Total Sample thus revealed that the comparison of group means in the objectives - Knowledge and Application and Total Achievement in Social Sciences reported significant group differences.

4.2.4. Analysis of Variance for Achievement in Social Sciences (Objective wise and Total Score) for Boys (N = 442)

Separate ANOVA for the Sub-samples formed on the basis of Sex, Locale and Type of management of schools were executed to find out the Sub-sample wise influence of Independent Variables on Dependent Variables.

Summary of Three-way ANOVA for Achievement in Social Sciences (Objective wise and Total Score) for Boys is presented in Table 4.12.

TABLE 4.12

Summary of Three-way ANOVA
for Achievement in Social Sciences (Objective wise
and Total Score) By Learning Style By Approaches
to Studying By Classroom Climate for Boys (N = 442)

Dependent Variable	Sources of Variation	Main Effects			Two-way interaction			Three-way interaction
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
KNOWLEDGE	SS	4.90	23.89	9.97	5.65	20.36	25.161	54.55
	df	2	2	2	4	4	4	8
	MS	2.45	11.945	4.98	1.41	5.09	6.29	6.82
	F	0.394	1.922	0.803	0.227	0.819	1.012	1.097
COMPREHENSION	SS	42.40	16.32	105.80	93.582	117.62	111.64	172.82
	df	2	2	2	4	4	4	8
	MS	21.2	8.161	52.90	23.40	29.41	27.91	21.60
	F	1.253	0.482	3.127*	1.383	1.738	1.650	1.277
APPLICATION	SS	7.51	4.37	2.18	6.44	6.41	7.31	8.65
	df	2	2	2	4	4	4	8
	MS	3.76	2.18	1.09	1.61	1.60	1.83	1.08
	F	1.014	0.589	0.295	0.435	0.433	0.493	0.292
ANALYSIS	MS	1.11	2.55	10.92	5.14	11.49	10.39	29.09
	df	2	2	2	4	4	4	8
	MS	0.56	1.28	5.46	1.29	2.87	2.60	2.89
	F	0.32	0.73	2.15	0.74	1.65	1.49	1.65
SYNTHESIS	SS	2.53	0.55	7.57	4.93	8.53	2.76	13.59
	df	2	2	2	4	4	4	8
	MS	1.27	0.27	3.78	1.23	2.15	0.69	1.70
	F	0.86	0.18	2.56	0.83	1.45	0.47	1.15
EVALUATION	SS	0.16	0.13	6.61	5.71	7.12	7.96	17.55
	df	2	2	2	4	4	4	8
	MS	0.08	0.06	3.30	1.43	1.78	1.99	2.19
	F	0.05	0.04	1.97	0.85	1.06	1.18	1.31
ACHIEVEMENT IN SOCIAL SCIENCES (TOTAL SCORE)	SS	105.88	58.58	292.66	80.14	261.46	347.43	540.05
	df	2	2	2	4	4	4	8
	MS	52.94	29.29	146.33	20.04	65.36	86.86	67.51
	F	0.82	0.45	2.26	0.31	1.01	1.34	1.04

LS - Learning Style; AS - Approaches to Studying; CC - Classroom Climate

* $P < 0.05$

4.2.4.1. Main Effects of Independent Variables

The investigator examined the main effects of Independent Variables on Dependent Variables, using the Three-way ANOVA for Boys.

Main Effect of Learning Style

Table 4.12 reveals the main effect of Learning Style on Achievement in Social Sciences (Objective wise and Total Score) for Boys. The F-ratios obtained for the main effect of Learning Style on objectivewise and Total Score of Social Sciences were found below the tabled value (3.02) for df 2, 415 even at 0.05 level. It can be inferred from this results that the changes in *the levels of Learning Style could not Influence* the Achievement in Social Sciences (Objective wise and Total Score).

Main Effect of Approaches to Studying

The F-values obtained for the main effect of Approaches to Studying on Achievement in Social Sciences (Objective wise and Total Score) are below the tabled value (3.02) for the df 2, 415 even at 0.05 level. It indicated that the *Achievement in Social Sciences* (Objective wise and Total Score) is *independent of the changes in the levels of Approaches to Studying*.

Main Effect of Classroom Climate

As per Table 4.12 the main effect of Classroom Climate yielded significant F-value for the objective wise Achievement in Comprehension ($F = 3.127$) at 0.05 level for the df 2, 415. This result implies that *Achievement in the objective Comprehension is affected by the changes in the levels of Classroom Climate*.

But the F-ratios obtained for the objectives of Knowledge (0.803), Application (0.295), Analysis (2.15), Synthesis (2.56) and Evaluation (1.97) and Total Achievement in Social Sciences (2.26) are found to be below the tabled value even at 0.05 level. These results help to infer that Achievement in these areas is *independent of the changes in the levels of Classroom Climate*.

4.2.4.2. Two-Way Interactions

The results of two-way interactions of Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) are presented in Table 4.12. In all the three two-way interactions no significant F-ratio is obtained even at 0.05 level as the F-values are below the tabled value (2.39) for the df, 4, 415.

Based on these results it can be viewed that achievement in Social Sciences (Objective wise and Total Score) is not affected by *interactions of Learning Style x Approaches to studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate*.

4.2.4.3. Three-way Interaction

As per Table 4.12 *no significant* F-ratio was found for the three-way interaction of Learning Style x Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) for Boys. All the F-ratios obtained were found to be below the tabled value for significance at 0.05 level (Table value 1.96, df - 8,415).

It is evident from the results that variation in Achievement in Social Sciences (Objective wise and Total Score) for Boys is *Independent of the combined effect* of the variables Learning Style x Approaches to Studying x Classroom Climate.

4.2.4.4. Graphical Representation of Interactions in Boys

The pattern of relationships between Independent Variables and Dependent Variables (Achievement in Social Sciences Objective wise and Total Score) for Boys have been studied graphically, in Figures 4-8, 4-9 and 4-10. On the graph the Dependent Variables, Achievement in Social Sciences (Objective wise and Total score) have been plotted as the ordinate and the three levels of Classroom Climate - HFCC, MFCC and LFCC as the abscissa. The lines of the graph were represented by the three levels of Approaches to Studying - HDAS, MDAS and LDAS. The graph is constructed in the background of the three levels of Learning Style HPLS, MPLS and LPLS.

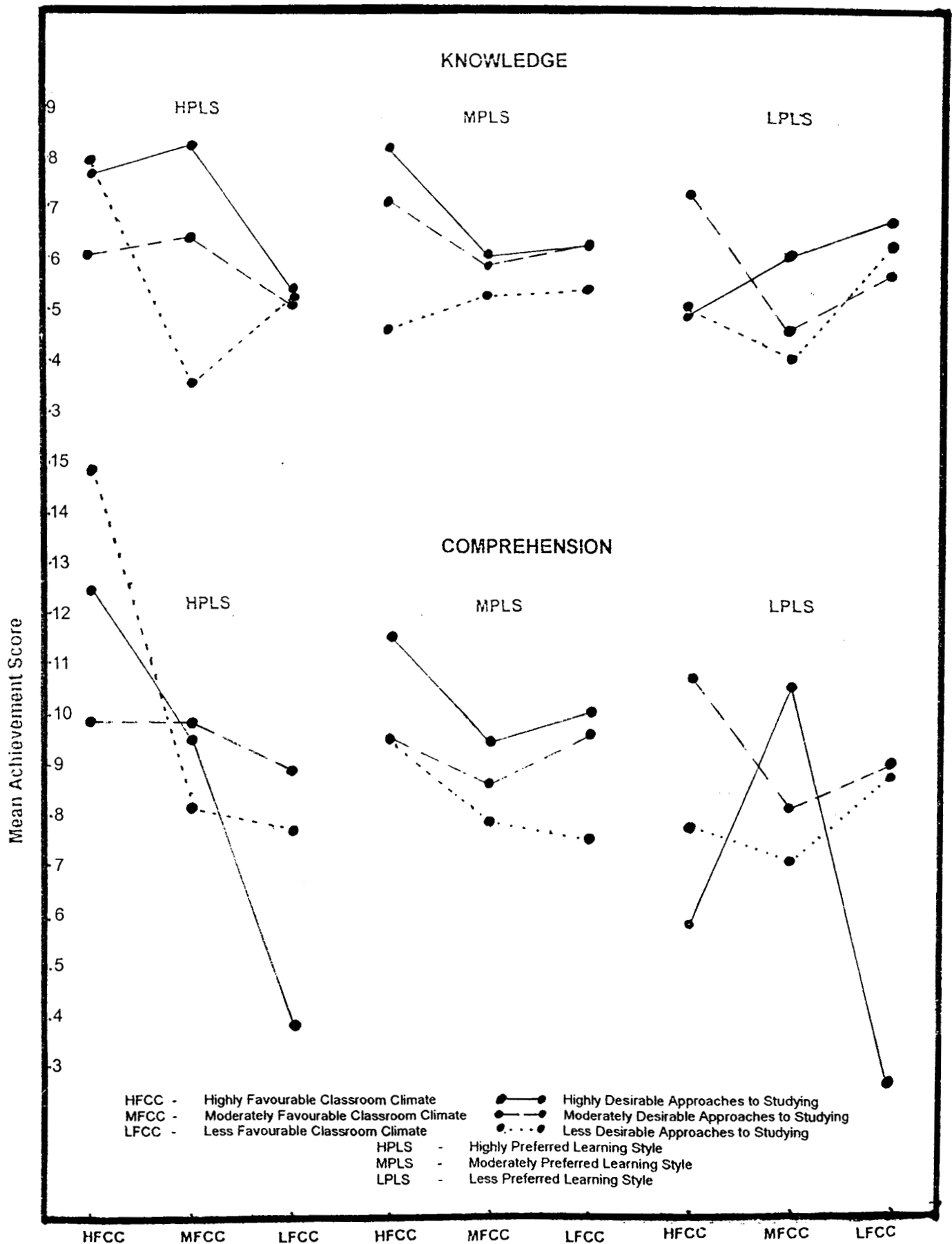


FIGURE 4-8 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Knowledge and Comprehension) for Boys

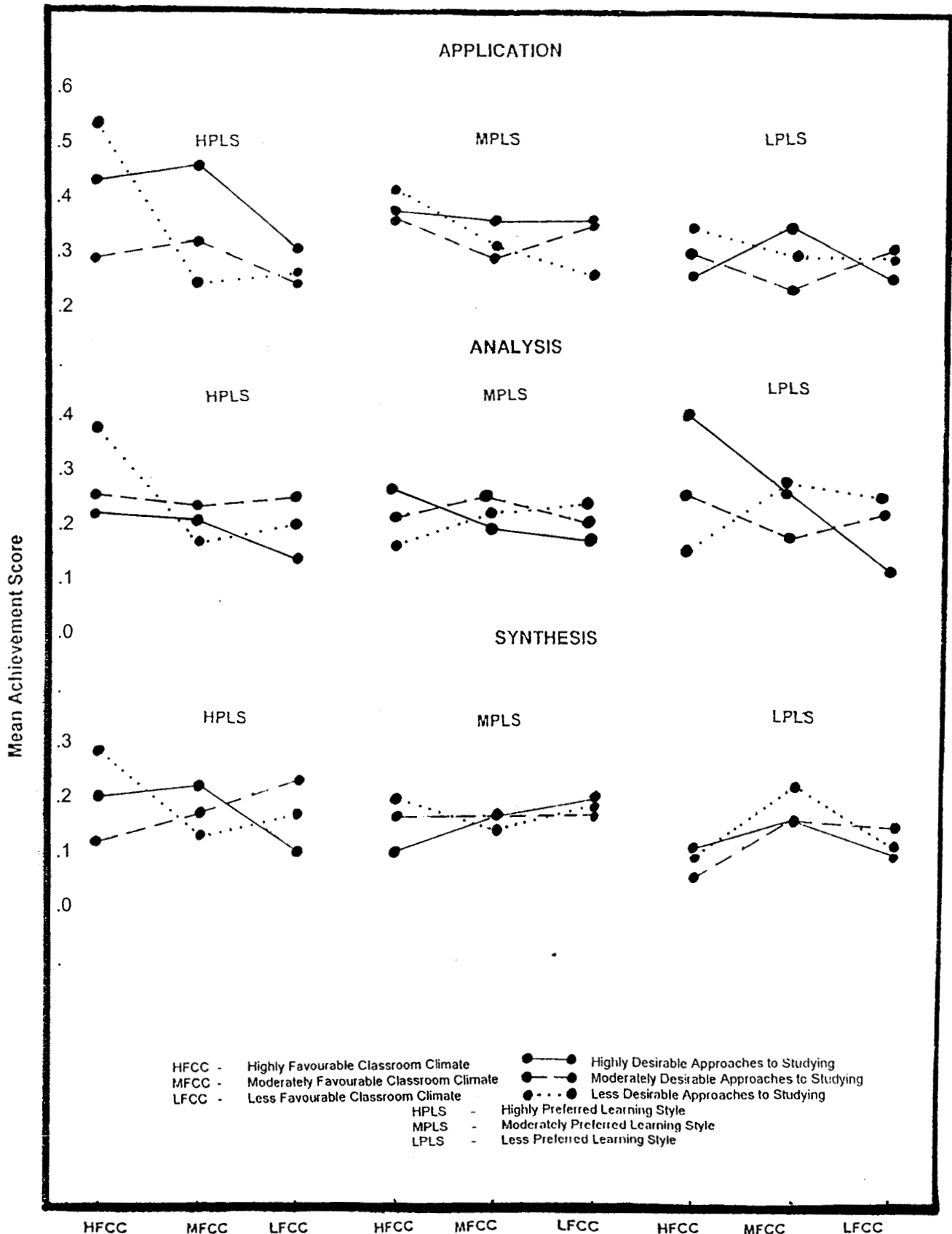


FIGURE 4-9 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Application, Analysis and Synthesis) for Boys

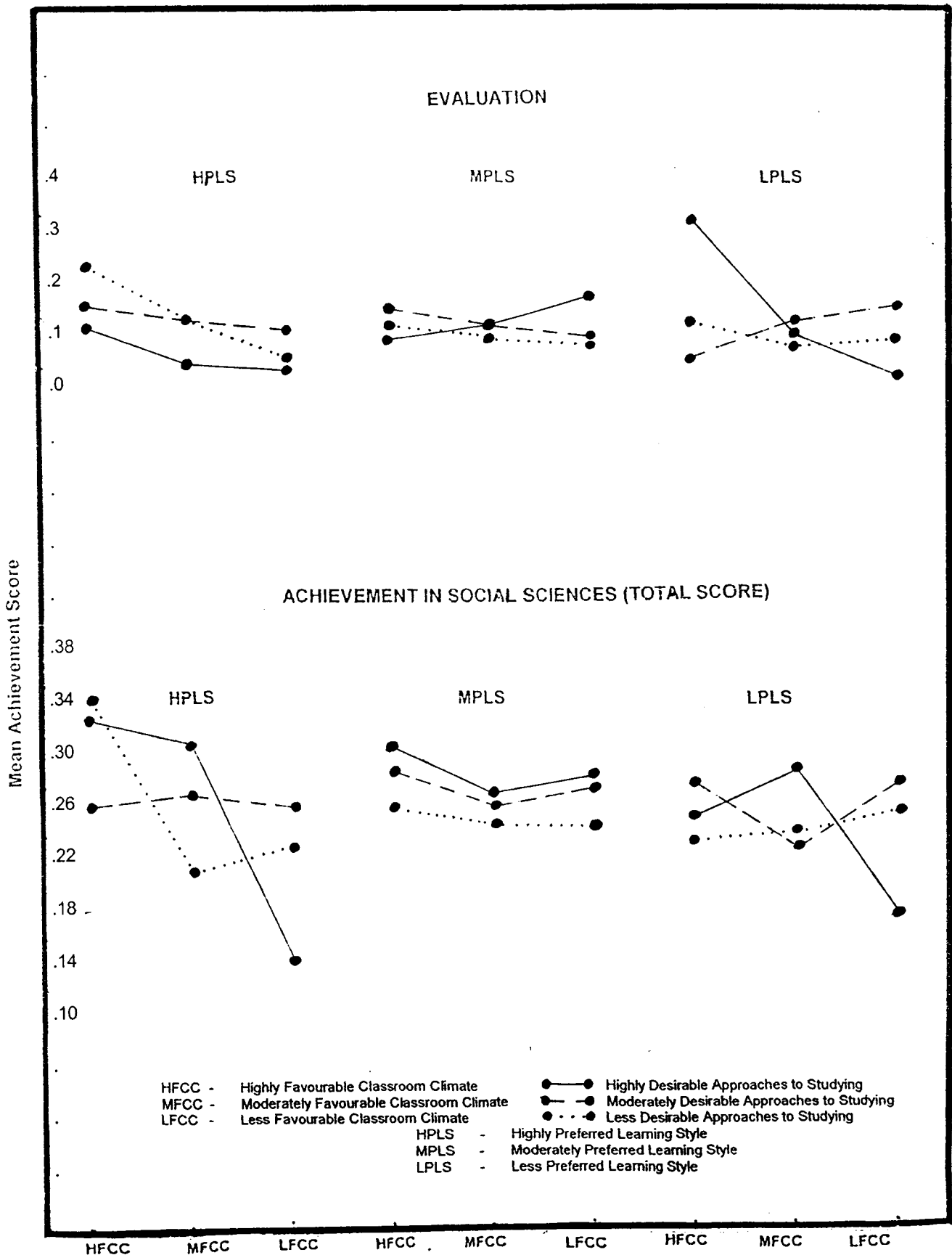


FIGURE 4-10 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objective - Evaluation and Total Score) for Boys

Graphical representation of interactions in the objective Knowledge and Comprehension are given in Figure 4-8. In the objective - Knowledge HDAS pupils obtained high Achievement Scores in HPLS and MPLS. HPLS pupils with MFCC and MPLS pupils with HFCC showed high performances. In LPLS pupils with MDAS achieved high scores with the help of HFCC.

In the objective Comprehension LDAS pupils excelled in performance with HFCC in MPLS. HFCC supported HDAS pupils also to achieve high scores in HPLS and MPLS. The MDAS pupils in LPLS also benefitted by HFCC.

The pattern of relationships are presented graphically for the objective Application, Analysis and Synthesis in Figure 4-9. In Application high performance is associated with LDAS pupils with HFCC in all the three levels of Learning Style. Achievement of HDAS pupils was favoured by MFCC in HPLS and LPLS.

The pattern of relationship in the objective - Analysis revealed high level of performance for LDAS pupils in HPLS and for HDAS pupils in LPLS with HFCC. Further HFCC helped to achieve high scores for HDAS and MDAS pupils in all the three levels of Learning Style.

In the objective Synthesis better level of performance is shown by LDAS pupils in all the three levels of Learning style. Here the HDAS pupils were benefitted by MFCC in HPLS and LPLS.

Figure 4-10 shows the graphical relationships of Independent Variables on the objective Evaluation and the Total Score of Social Sciences.

In Evaluation high achievement scores are obtained by HDAS pupils and LDAS pupils with HFCC. The MDAS and LDAS pupils were also benefitted by HFCC in HPLS and MPLS.

The graphical representation of interactions for Boys revealed a general trend of *high achievement for pupils who preferred HPLS and HDAS with HFCC*.

4.2.4.5. Post-hoc Comparison of Group Means

As per Table 4.12 the Three-way ANOVA for Boys reported significant main effect of Classroom Climate on Achievement in the objective - Comprehension ($P < 0.05$) only. Scheffe' test of Post-hoc comparison was thus used to analyse each possible pair of means based on Classroom Climate, to determine which group is significantly differentiating the Achievement in the objective Comprehension. The results of Post-hoc comparisons based on three levels of Classroom Climate are presented in Table 4.13.

TABLE 4.13

**Results of Scheffe' Test of
Post-hoc Comparison Between Means of
Achievement in Social Sciences (Comprehension)
Based on Three Groups of Classroom Climate for Boys (N = 442)**

Dependent Variable	Groups Compared	Means		F	Values of F'		Level of Significance
		M ₁	M ₂		0.05	0.01	
Comprehension	HFCC - MFCC	10.47	8.92	9.09	6.04	9.32	0.05
	HFCC - LFCC	10.47	9.01	5.32	6.08	9.42	NS
	MFCC - LFCC	8.92	9.01	0.69	6.04	9.32	NS

NS - Not Significant

HFCC - Highly Favourable Classroom Climate

MFCC - Moderately Favourable Classroom Climate

LFCC - Less Favourable Classroom Climate.

Table 4.13 revealed that when the mean achievement scores in the objective - Comprehension were compared the pair HFCC - MFCC yielded significant mean difference ($P < 0.05$) as the corresponding F-ratio is greater than the value of F^1 required to be significant.

Results of Post-hoc comparison revealed that pupils belong to the groups HFCC and MFCC differentiate Achievement in Social Sciences (Comprehension) significantly. Since higher mean score is attached to the group HFCC, it is evident that, variations in Achievement in Social Sciences (Comprehension) is due to HFCC group which is advantageous over MFCC.

4.2.5. Analysis of Variance for Achievement in Social Sciences (Objective wise and Total Score) for Girls (N = 475)

Inorder to find out the influence of Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) for the Sub-sample, Girls separate ANOVA was conducted. Summary of Three-way ANOVA for Girls is presented in Table 4.14.

TABLE 4.14

**Summary of Three-way ANOVA
for Achievement in Social Sciences (Objective wise
and Total Score) By Learning Style By Approaches
to Studying By Classroom Climate for Girls (N = 475)**

Dependent Variable	Sources of Variation	Main Effects			Two-way interaction			Three-way interaction
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
KNOWLEDGE	SS	22.04	32.82	14.31	9.26	13.37	20.80	36.50
	df	2	2	2	4	4	4	8
	MS	11.02	16.41	7.15	2.31	3.34	5.20	4.56
	F	2.158	3.214*	1.401	0.453	0.655	1.018	0.894
COMPREHENSION	SS	118.24	43.87	5.24	25.11	42.27	48.33	202.44
	df	2	2	2	4	4	4	8
	MS	59.12	21.94	2.62	6.28	10.57	12.08	25.31
	F	3.497*	1.298	0.155	0.371	0.625	0.715	1.497
APPLICATION	SS	25.73	35.51	7.80	16.94	14.69	23.14	34.61
	df	2	2	2	4	4	4	8
	MS	12.86	17.76	3.90	4.23	3.67	5.78	4.33
	F	2.549	3.518*	0.773	0.839	0.728	1.146	0.857
ANALYSIS	SS	0.87	2.83	2.56	10.34	4.58	6.72	17.52
	df	2	2	2	4	4	4	8
	MS	0.431	1.41	1.30	2.58	1.14	1.68	2.19
	F	0.236	0.774	0.710	1.414	0.626	0.919	1.198
SYNTHESIS	SS	2.56	0.02	0.98	6.17	9.14	6.63	15.35
	df	2	2	2	4	4	4	8
	MS	1.28	0.01	0.49	1.54	2.28	1.66	1.92
	F	0.647	0.005	0.248	0.779	1.153	0.835	0.968
EVALUATION	SS	1.73	8.15	1.16	4.23	2.24	5.54	6.52
	df	2	2	2	4	4	4	8
	MS	0.86	4.08	0.58	1.06	0.56	1.39	0.81
	F	0.552	2.607	0.373	0.676	0.358	0.887	0.521
ACHIEVEMENT IN SOCIAL SCIENCES (TOTAL SCORE)	SS	509.51	355.73	91.83	177.49	183.20	260.18	462.40
	df	2	2	2	4	4	4	8
	MS	254.76	177.87	45.92	44.37	45.80	65.04	57.80
	F	3.862*	2.696	0.696	0.673	0.694	0.986	0.876

LS - Learning Style; AS - Approaches to Studying; CC - Classroom Climate

* P < 0.05

4.2.5.1. Main Effects of Independent Variables

The main effects of Independent Variables on Dependent Variables is shown in Table 4.14.

Main Effect of Learning Style

The F-values obtained for the main effect of Learning Style on the objective - Comprehension and the Total Achievement in Social Sciences are 3.497 and 3.862 respectively. As these values are above the tabled value of 3.02 for df 2,448 at 0.05 level, it can be inferred that *Achievement in Social Sciences* (Comprehension and Total Score) is *influenced by the Changes in Learning Style*. But the F-values reported for the objectives Knowledge (2.158), Application (2.549), Analysis (0.236) Synthesis (0.647) and Evaluation (0.552) are below the tabled value required to be significant even at 0.05 level. It indicates that *Achievement of Girls in these objectives is Independent of Changes in the levels of Learning Styles*.

Main Effect of Approaches to Studying

For Approaches to Studying the F-values obtained for the objectives - Knowledge (3.214) and Application (3.518) are above the tabled value ($P < 0.05$) implying that for *Girls Achievement in the objectives - Knowledge and Application is influenced by Approaches to Studying*. However for Comprehension ($F = 1.298$), Analysis ($F = 0.774$), Synthesis ($F = 0.005$), Evaluation ($F = 2.607$) and Total Achievement in Social Sciences ($F = 2.696$) the F-values obtained are below the tabled value even at 0.05 level, showing the *inability of Approaches to Studying to influence the Achievement in Social Sciences of Girls in these areas*.

Main Effect of Classroom Climate

The F-values obtained for the main effect of Classroom Climate on the objectivewise and Total Score of Social Sciences were found below the tabled value (3.02) for df 2,448 even at 0.05 level. It points out that *the main effect of Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) of Girls is found to be not significant.*

4.2.5.2. Two-way Interactions

The results of the Two-way interactions of Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) are presented in Table 4.14. The F-values obtained for all Two-way interactions were found below the tabled value (2.39) for df - 4,448 even at 0.05 level.

These results indicate that *Achievement in Social Sciences (Objective wise and Total Score) is not influenced by the combined effect of Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate.*

4.2.5.3. Three-way Interaction

Table 4.14 revealed that the Three-way interaction of Learning Style x Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) reported no significant F-ratio even at 0.05 level (tabled value = 1.96, df - 8,448).

It can be noted from the results that the *joint effect of Learning Style x Approaches to Studying x Classroom Climate is not sufficient to create variation in Achievement in Social Sciences of Girls.*

4.2.5.4. Graphical Representation of Interactions in Girls

Figures 4-11, 4-12, 4-13 reveal the graphical representation of pattern of relationship between Independent Variables and Dependent Variables. On the graph Achievement in Social Sciences (Objective wise and Total Score) of Girls has been plotted as the ordinate and the abscissa is represented by the three levels of Classroom Climate - HFCC, MFCC and LFCC. The lines of the graph stands for the three levels of Approaches to studying - HDAS, MDAS and LDAS. The graph is constructed in the background of three levels of Learning Style - HPLS, MPLS and LPLS.

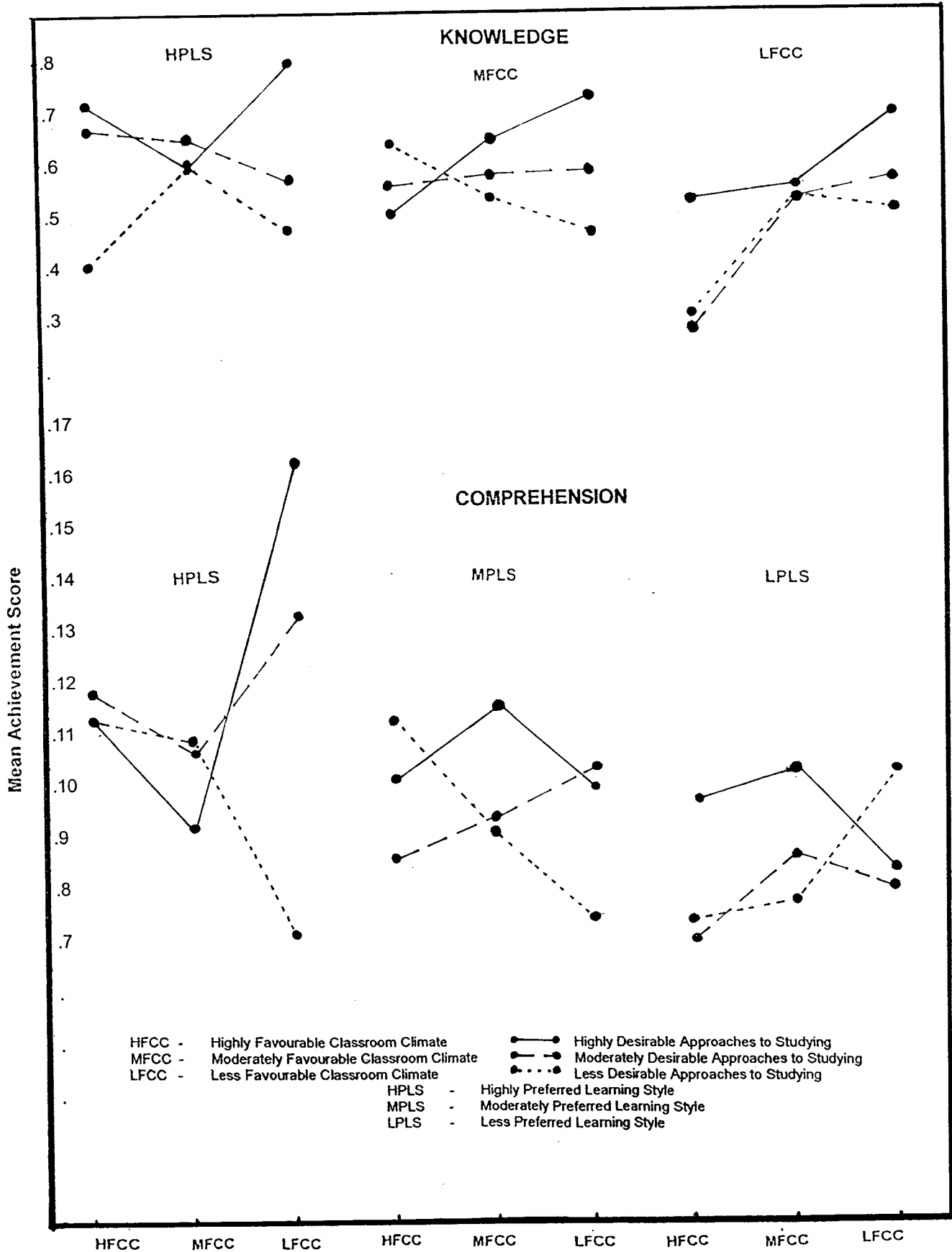


FIGURE 4-11 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Knowledge and Comprehension) for Girls

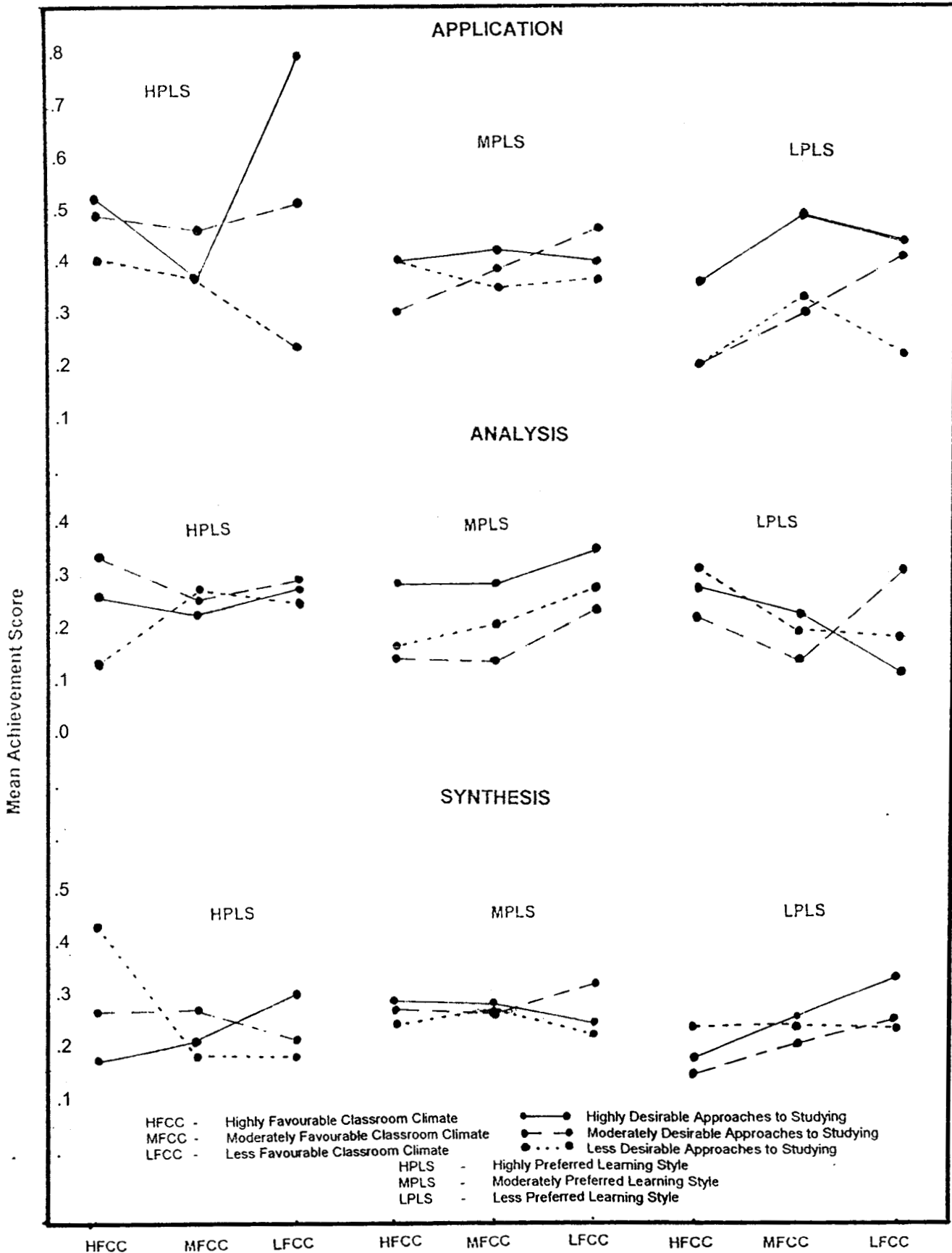


FIGURE 4-12. Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Application, Analysis and Synthesis) for Girls

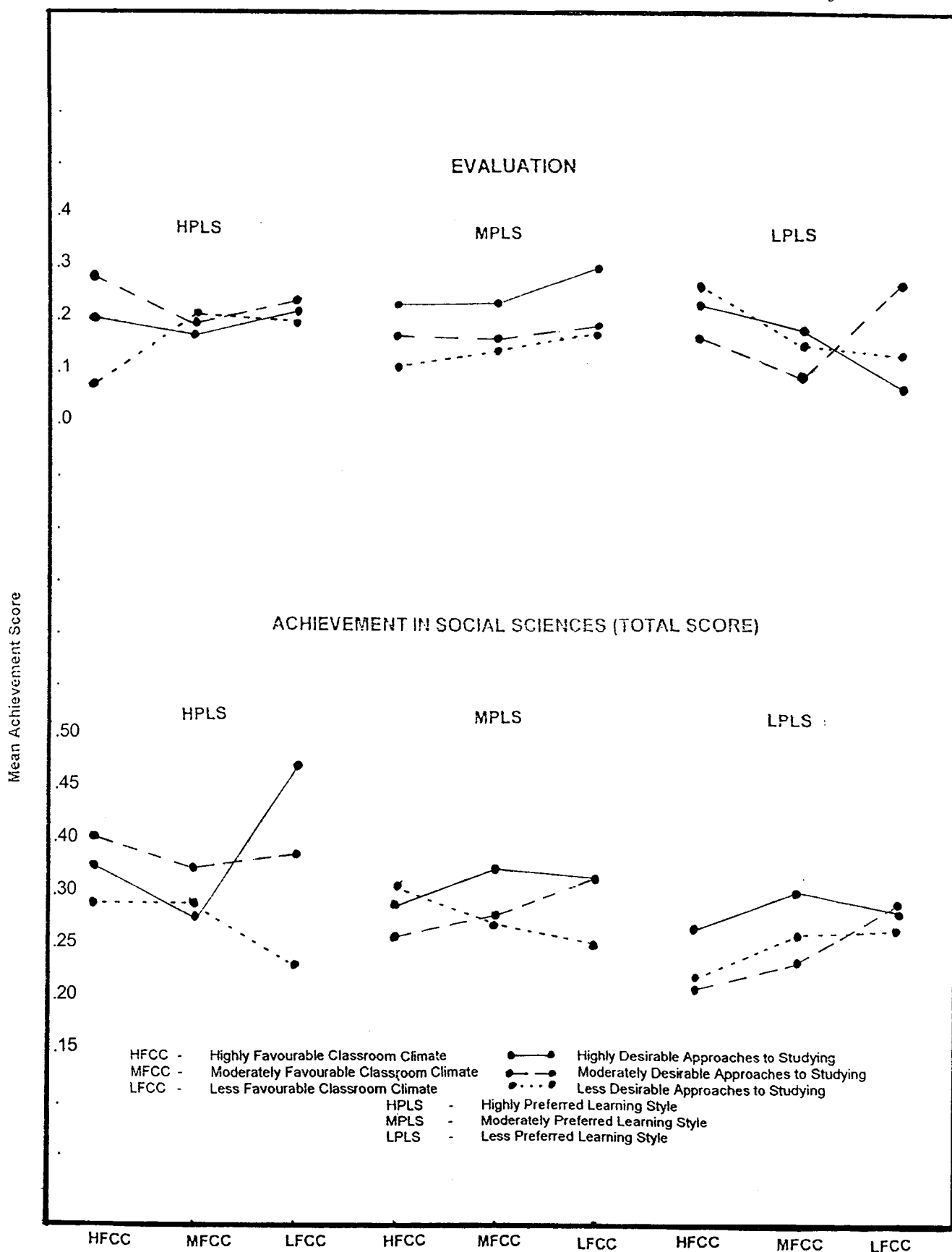


FIGURE 4-13 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objective - Evaluation and Total Score) for Girls

Figure 4-11 shows that Achievement in the objective - Knowledge is higher for pupils who preferred HDAS with LFCC at all the three levels of Learning Style. For the pupils who adopted MDAS higher level of Achievement can be noticed with LFCC in MPLS and LPLS. The LDAS pupils were benefitted by MFCC when preferred HPLS and LPLS.

Achievement in the objective-Comprehension is positively influenced by MFCC for MPLS and LPLS pupils when adopted HDAS, but for HPLS pupils it is high with LFCC. The MDAS pupils are benefitted by LFCC in HPLS and MPLS. For pupils who adopted LDAS higher levels of scores were obtained by HFCC in HPLS and MPLS.

Graphical representation of Achievement in the objective Application is presented in Figure 4-12. It projects higher level of Achievement for HDAS pupils by MFCC in MPLS and LPLS and in HPLS by LFCC. For the pupil who preferred MDAS higher level of Achievement is visualised with LFCC. But LDAS pupils were supported by HFCC in HPLS and MPLS.

As per Figure 4-12 in the objective - Analysis higher level of Achievement took place by LFCC for HDAS pupils in HPLS and MPLS. For the pupils who preferred MDAS higher Achievement scores are associated with LFCC in MPLS and LPLS. However LDAS pupils are differently influenced by the three levels of Classroom Climate.

Figure 4-12 further reveals that in the objective - Synthesis the HDAS pupils were supported by LFCC in HPLS and LPLS. For the pupils who adopted MDAS higher levels of Achievement was facilitated by LFCC in

MPLS and LPLS. But LDAS pupils did not show any common pattern of relationship in Achievement.

The graphical representation of Achievement in Evaluation and Total Score of Social Sciences is presented in Figure 4-13. The HDAS pupils visualised higher Achievement in HPLS and MPLS with LFCC. But no common pattern of relationship is visible for MDAS and LDAS pupils at the three levels of Learning Style and Classroom Climate. In Achievement in Social Sciences (Total Score) the pupils who preferred HDAS were benefitted by MFCC in MPLS and LPLS while LFCC favoured higher scores in HPLS. The MDAS pupils were gained by LFCC in MPLS and LPLS. The LDAS pupils are again failed to form a common pattern of relationship at the three levels of Learning Style and Classroom Climate.

The *general trend* that can be observed from the graphical representation of interactions *for Girls is that the level of Achievement is higher for HDAS pupils when associated with HPLS and LFCC.*

4.2.5.5. Post-hoc Comparison of Group Means

Analysis of Variance in respect of Girls revealed that the Independent Variable, Learning Style exercised significant main effect on Achievement in the objective Comprehension and Social Sciences (total) and Approaches to Studying on Achievement in objectives - Knowledge and Application. Inorder to find out exactly where the significant differences lie the investigator performed Scheffe' Test of Post-hoc comparison. Results of the comparisons are summarised in Table 4.15.

TABLE 4.15

**Results of Scheffe' Test of Post -hoc
Comparison Between Means of Achievement in
Social Sciences (Objective wise and Total Score) Based on Three
Groups of Learning Style and Approaches to Studying for Girls (N = 475)**

Dependent Variable	Groups Compared	Means		F	Values of F ¹		Level of Significance
		M ₁	M ₂		0.05	0.01	
Knowledge	HDAS - MDAS	7.26	6.81	2.22	6.04	9.32	NS
	HDAS - LDAS	7.26	6.36	6.18	6.14	9.56	0.05
	MDAS - LDAS	6.81	6.36	2.805	6.04	9.32	NS
Comprehension	HPLS - MPLS	11.74	10.21	9.03	6.04	9.32	0.05
	HPLS - LPLS	11.74	9.34	11.87	6.12	9.5	0.01
	MPLS - LPLS	10.21	9.34	2.70	6.04	9.32	NS
Application	HDAS - MDAS	4.41	3.98	2.05	6.04	9.32	NS
	HDAS - LDAS	4.41	3.44	7.29	6.12	9.5	0.05
	MDAS - LDAS	3.98	3.44	4.08	6.04	9.32	NS
Achievement in Social Sciences (Total)	HPLS - MPLS	29.99	27.04	7.37	6.04	9.66	0.05
	HPLS - LPLS	29.99	24.46	14.86	6.14	9.56	0.01
	MPLS - LPLS	27.04	24.46	7.16	6.04	9.32	0.05

HPLS - Highly Preferred Learning Style

MPLS - Moderately Preferred Learning Style

LPLS - Less Preferred Learning Style

HDAS - Highly Desirable Approaches to Studying

MDAS - Moderately Desirable Approaches to Studying

LDAS - Less Desirable Approaches to Studying

NS - Not Significant

The mean achievement scores (Comprehension and Total Score) for Girls categorised into three groups based on Learning Style (HPLS, MPLS and LPLS) were compared and results analysed.

Table 4.15 reveals that for the objective - Comprehension the F-ratios obtained for the pairs HPLS - MPLS, HPLS - LPLS and MPLS - LPLS are 9.03, 11.87 and 2.70 respectively. Significant differences for HPLS - MPLS group ($P < 0.05$) and HPLS - LPLS group ($P < 0.01$) were noticed as the corresponding F-values are above the values of F^1 required for significance. For HPLS - MPLS group $F = 9.03$, $F^1 = 6.04$ and $df = 2,411$ and for HPLS - LPLS group $F = 11.87$, $F^1 = 9.5$ and $df = 2,139$. The third group MPLS - LPLS did not show a significant F-ratio even at 0.05 level ($F = 2.70$, $F^1 = 6.04$ and $df = 2,391$). Hence it can be inferred that the groups - HPLS - MPLS and HPLS - LPLS are significantly differentiated by their mean achievement scores.

For Achievement in Social Sciences (Total Score) all the three groups are found to have significant F-ratios. For HPLS - MPLS group ($F = 7.37$, $F^1 = 6.04$ and $df = 2,381$) and MPLS - LPLS group ($F = 7.16$, $F^1 = 6.04$ and $df = 2,404$) the mean differences are at 0.05 level and for HPLS - LPLS group ($F = 14.86$, $F^1 = 9.56$ and $df = 2,126$) at 0.01 level. It shows that all the three groups of Learning Style *differ significantly* in their mean achievement scores in Social Sciences (Total Score) for Girls.

The mean achievement scores in the objectives - Knowledge and Application for Girls Classified into three groups based on Approaches to Studying (HDAS, MDAS & LDAS) were compared and results examined.

It is clear from Table 4.15 that the F-ratio obtained for the objective - Knowledge is significant for the group HDAS - LDAS ($F = 6.18$, $F^1 = 6.14$ and $df = 2,131$) at 0.05 level. The HDAS - MDAS group ($F = 2.29$, $F^1 = 6.04$, $df = 2,381$) and MDAS - LDAS group ($F = 2.805$, $F^1 = 6.04$, $df = 2,404$) did not obtain F-value exceeding F^1 even at 0.05 level. It shows that the significant mean difference lies in the HDAS - LDAS group.

Table 4.15 further shows that for the objective - Application the F-ratio obtained for the group HDAS - LDAS is significant at 0.05 level ($F = 7.29$, $F^1 = 6.12$ and $df = 2,156$). The HDAS - MDAS group ($F = 2.05$, $F^1 = 6.04$ and $df = 2,381$) and MDAS - LDAS group ($F = 4.08$, $F^1 = 6.04$ and $df = 2, 404$) did not yield the F-value that exceeds F^1 even at 0.05 level. It implies that the significant mean difference in the objective - Application for Girls lies in HDAS - LDAS group.

4.2.6. Analysis of Variance for Achievement in Social Sciences (Objective wise and Total Score) for Rural Sample (N = 611)

The separate ANOVA carried out for the Rural Subsample helped to find out the influence of Independent Variables on Achievement in Social Sciences (Objective wise and Total Score). Summary of Three-way ANOVA for Rural sample is presented in Table 4.16.

TABLE 4.16

**Summary of Three-way ANOVA
for Achievement in Social Sciences (Objective wise
and Total Score) By Learning Style By Approaches
to Studying By Classroom Climate for Rural Sample (N = 611)**

Dependent Variable	Sources of Variation	Main Effects			Two-way interaction			Three-way interaction
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
KNOWLEDGE	SS	21.55	81.577	1.21	15.61	3.59	35.12	35.09
	df	2	2	2	4	4	4	8
	MS	10.77	40.79	0.61	3.91	0.90	8.78	4.39
	F	2.018	7.369**	0.114	0.731	0.168	1.644	0.821
COMPREHENSION	SS	121.87	68.46	27.68	67.23	46.80	81.95	219.15
	df	2	2	2	4	4	4	8
	MS	60.94	34.23	13.84	16.81	11.70	20.49	27.39
	F	3.727*	2.094	0.847	1.028	0.716	1.253	1.676
APPLICATION	SS	15.77	37.98	1.20	17.90	24.57	22.89	30.02
	df	2	2	2	4	4	4	8
	MS	7.88	18.99	0.60	4.47	6.14	5.72	3.75
	F	1.741	4.193*	0.133	0.988	1.356	1.264	0.829
ANALYSIS	SS	0.65	4.02	1.59	4.85	1.10	12.59	9.73
	df	2	2	2	4	4	4	8
	MS	0.33	2.01	0.79	1.21	0.27	3.15	1.22
	F	0.182	1.123	0.446	0.678	0.153	1.758	0.679
SYNTHESIS	SS	12.24	3.36	0.99	6.11	5.92	10.43	22.72
	df	2	2	2	4	4	4	8
	MS	6.12	1.68	0.49	1.53	1.48	2.61	2.84
	F	3.345*	0.918	0.269	0.835	0.809	1.425	1.552
EVALUATION	SS	4.29	5.75	0.68	7.24	2.87	5.33	10.41
	df	2	2	2	4	4	4	8
	MS	2.14	2.87	0.34	1.81	0.72	1.33	1.30
	F	1.300	1.742	0.208	1.094	0.435	0.807	0.789
ACHIEVEMENT IN SOCIAL SCIENCES (TOTAL SCORE)	SS	480.77	569.19	66.35	263.19	243.61	295.66	668.39
	df	2	2	2	4	4	4	8
	MS	240.38	284.59	33.17	65.79	60.90	73.91	83.55
	F	3.705*	4.387*	0.511	1.014	0.939	1.139	1.288

LS - Learning Style; AS – Approaches to Studying; CC - Classroom Climate

* $P < 0.05$; ** $p < 0.01$

4.2.6.1. Main Effects of Independent Variables

The main effect of Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) were examined through 3x3x3 ANOVA and are given in Table 4.16.

Main Effect of Learning Style

The Independent Variable, Learning Style obtained significant F-values for the objectives - Comprehension ($F = 3.727$), Synthesis ($F = 3.345$) and Total Achievement in Social Sciences ($F = 3.705$). These values are above the tabled value (3.02) at 0.05 level for df - 2, 584. It can be inferred that *when the level of Learning Style Changes, a corresponding change in the Achievement in Social Sciences (Comprehension, Synthesis and Total Score) is occurred*. No significant main effect is obtained for the other objectives - Knowledge ($F = 2.018$), Application ($F = 1.741$), Analysis ($F = 0.182$) and Evaluation ($F = 1.300$) as the F-values are below the tabled value required to be significant even at 0.05 level. This indicated that Achievement in these objectives is not influenced by changes in the levels of Learning Style.

Main Effect of Approaches to Studying

The Independent Variable, Approaches to Studying reported significant main effect on the objectives - Knowledge ($F = 7.369$) at 0.01 level and Application ($F = 4.193$) at 0.05 level and total score of Achievement in Social Sciences ($F = 4.387$) at 0.05 level for df, 2, 584. As these F-values are above the tabled value it can be inferred that Achievement in Social Sciences (Knowledge, Application and Total Score) are *affected by changes*

in the levels of Approaches to Studying. But the F-values obtained for the main effect on objectives - Comprehension (2.094) Analysis (1.123), Synthesis (0.918) and Evaluation (1.742) are below the tabled value indicating that *Achievement in these objectives are independent of the changes in Approaches to Studying.*

Main Effect of Classroom Climate

No significant main effect of Classroom Climate on Achievement in all objectives - Knowledge ($F = 0.114$), Comprehension ($F = 0.847$), Application ($F = 0.133$), Analysis ($F = 0.446$) Synthesis ($F = 0.269$) and Evaluation ($F = 0.208$) and Total Score ($F = 0.511$) is noticed. All F-ratios are below the tabled value even at 0.05 level. It implies that *the Achievement in Social Sciences of Rural Pupils is not influenced by Classroom Climate.*

4.2.6.2. Two-way Interactions

Table 4.16 gives the results of Two-way interactions of Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score). No significant F-ratio is obtained for all the three two-way interactions even at 0.05 level as the F-values are below the tabled value (2.39) for df 4, 584. It can be inferred from the results that the *joined effect of Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate did not make a change in Achievement in Social Sciences of Rural Pupils.*

4.2.6.3. *Three-way Interaction*

As per Table 4.16 the F-values obtained for the three-way interaction of Learning Style x Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total score) for Rural Sample are also found not significant even at 0.05 level. The F-values obtained are below the tabled value of 1.96 for df 8, 584. It is evident from the results that the *Achievement in Social Sciences* (Objective wise and Total Score) *is not influenced by the interaction effect of the three Independent Variables in Combination.*

4.2.6.4. *Graphical Representation of Interactions in Rural Sample*

The graphical representations of the pattern of relationships between Independent and Dependent Variables for Rural Sample have been presented in Figures 4-14, 4-15 and 4-16.

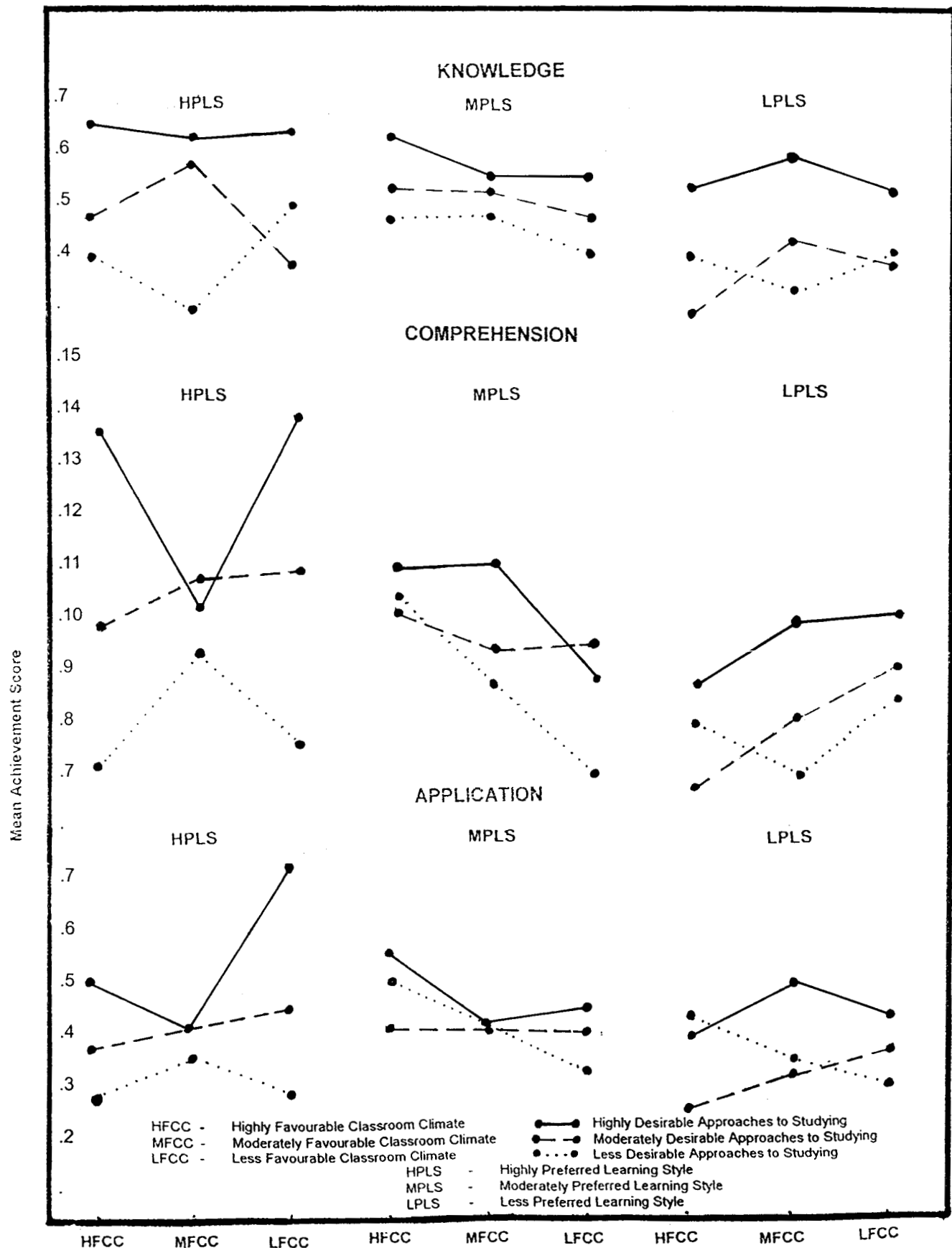


FIGURE 4-14 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Knowledge, Comprehension and Application) for Rural Sample

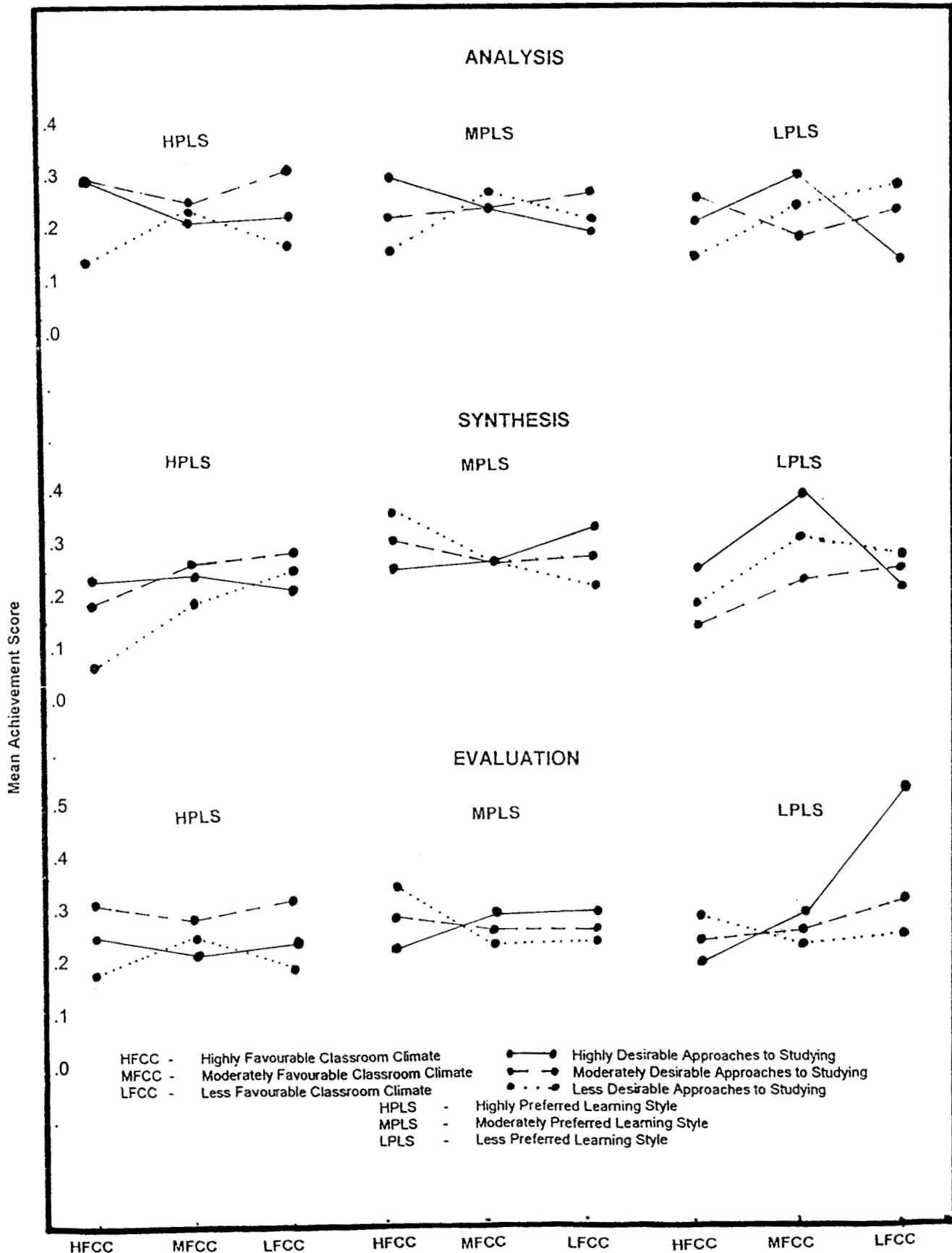


FIGURE 4-15 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Analysis, Synthesis and Evaluation) for Rural Sample

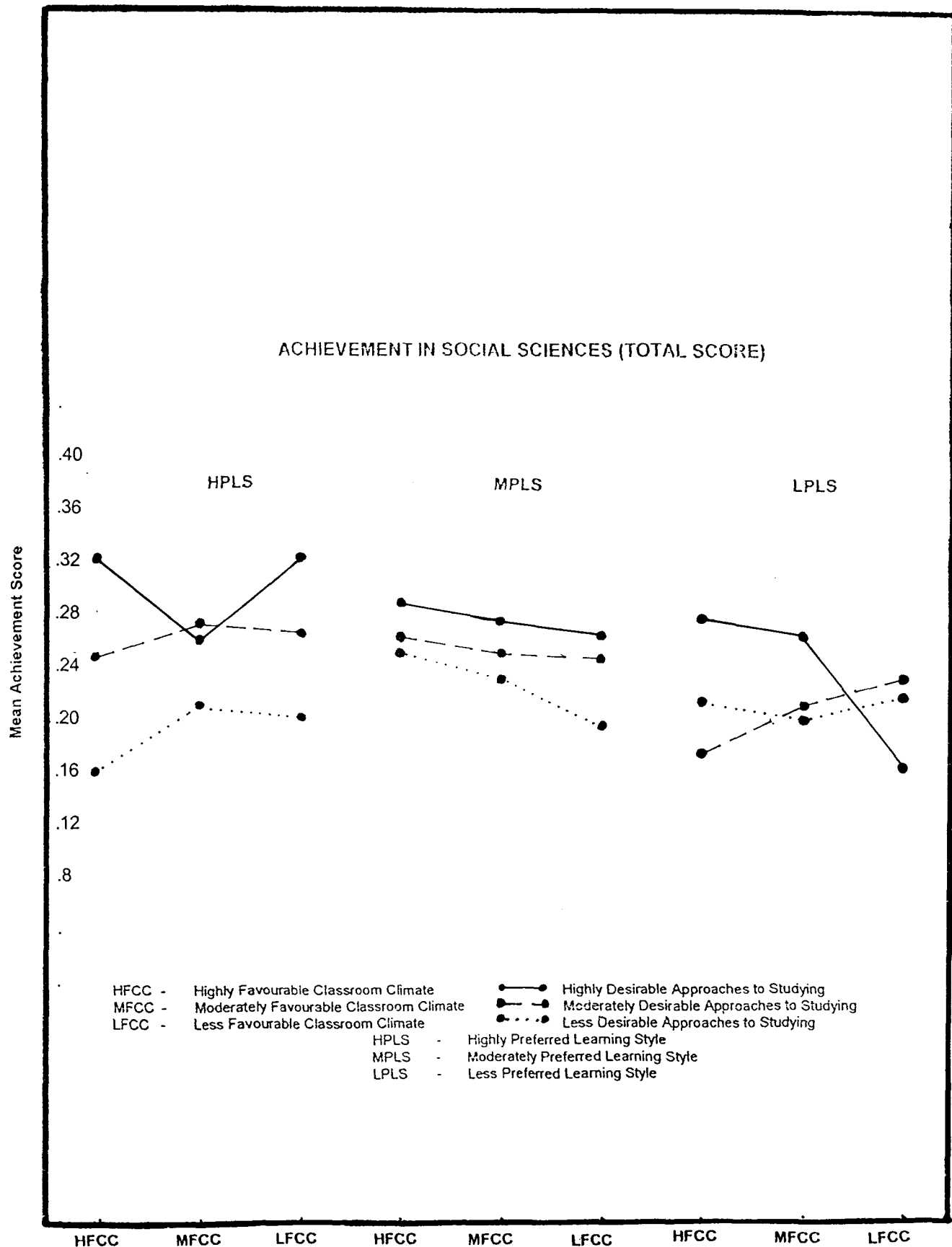


FIGURE 4-16 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Total Score) for Rural Sample

The mean achievement scores of Dependent Variables - Achievement in Social Sciences (Objective wise and Total Score) has been plotted as the ordinate and the three levels of Classroom Climate - HFCC, MFCC and LFCC as the abscissa. The three levels of Approaches to Studying - HDAS, MDAS and LDAS are represented by the lines of the graph. The background of the graph is the three levels of Learning Style - HPLS, MPLS and LPLS.

The pattern of interaction in the objectives - Knowledge, Comprehension and Application are presented in Figure 4-14. In Knowledge the pupils who preferred HDAS have obtained high mean achievement scores with HFCC for HPLS and MPLS groups. For the MDAS pupils MFCC favoured with HPLS and LPLS.

In Comprehension HDAS pupils achieved high scores. No common trend in performances could be noticed. But the pupils who follow MDAS were benefitted with LFCC in HPLS and LPLS, while HFCC favoured MPLS group.

In the objective Application, MFCC offered low level of scores for HDAS pupils in HPLS and MPLS groups. But the HPLS and LPLS pupils received higher achievement scores with LFCC when they preferred to follow MDAS. The Achievement of MPLS and LPLS pupils was supported by HFCC when LDAS was preferred.

The graphical patterns of interaction in the objectives - Analysis Synthesis and Evaluation are presented in Figure 4-15. In the objective Analysis, achievement scores of HPLS and MPLS pupils were higher with

HFCC when HDAS was preferred to follow. But the LPLS pupils were supported by MFCC. The achievement of pupils who adopted MDAS was found disadvantageous when MFCC was chosen. For the LDAS pupils higher performance could be found with MFCC for HPLS and MPLS groups.

In the objective Synthesis for the pupils who preferred HDAS no common trend in achievement could be noticed. But for MDAS pupils' better performances could be found with LFCC for HPLS and LPLS groups. For pupils with LDAS also no general trend in achievement is visible.

Figure 4-15 shows that in the objective - Evaluation HDAS pupils received high achievement scores with LFCC for MPLS and LPLS groups. LFCC favoured HPLS and LPLS pupils when MDAS was adopted. But HFCC was beneficial for MPLS and LPLS groups when LDAS was preferred.

Graphical representation for Achievement in Social Sciences (Total Score) is presented in Figure 4-16. It reveals that HDAS pupils who chose HFCC generally obtained *high achievement scores*. MDAS pupils when followed HFCC received lower scores in HPLS and LPLS categories. But in LDAS no general trend in achievement could be observed.

The general trend visible in the graphical representation of interaction effect for the Rural Sample is that higher level of Achievement is possible with HDAS and HFCC irrespective of the preferences in Learning Style.

4.2.6.5. Post-hoc Comparison of Group Means

Results of Three-way ANOVA for Rural Sample revealed that Learning Style had significant main effects on the objectives - Comprehension ($P < 0.05$), Synthesis ($P < 0.05$) and Total Achievement in Social Sciences ($P < 0.05$) and Approaches to Studying on the objectives - Knowledge ($P < 0.01$), Application ($P < 0.05$) and Total Achievement in Social Sciences ($P < 0.05$). To find out which of the three groups of the Independent Variables Significantly differ with regard to the Mean Achievement in Social Sciences, Scheffe' test of Post-hoc Comparison was executed.

The mean Achievement Scores based on three levels of Learning Style (HPLS, MPLS and LPLS) and Approaches to Studying (HDAS, MDAS and LDAS) were compared and results examined. Results of the Post-hoc comparison are summarised in Table 4.17.

TABLE 4.17

**Results of Scheffe' Test of Post -hoc
Comparison Between Means of Achievement in Social
Sciences (Objective wise and Total Score) Based on Three Groups
of Learning Style and Approaches to Studying for Rural Sample (N = 611)**

Dependent Variable	Groups Compared	Means		F	Values of F ¹		Level of Significance
		M ₁	M ₂		0.05	0.01	
Knowledge	HDAS - MDAS	6.96	6.16	9.69	6.00	9.24	0.01
	HDAS - LDAS	6.96	5.34	24.95	6.08	9.42	0.01
	MDAS - LDAS	6.16	5.34	10.31	6.00	9.24	0.01
Comprehension	HPLS - MPLS	10.69	9.50	9.34	6.00	9.24	0.01
	HPLS - LPLS	10.69	8.14	16.79	6.08	9.42	0.01
	MPLS - LPLS	9.51	8.14	7.48	6.00	9.24	0.05
Application	HDAS - MDAS	4.31	3.65	7.76	6.00	9.24	0.05
	HDAS - LDAS	4.31	3.38	9.66	6.08	9.42	0.01
	MDAS - LDAS	3.65	3.38	1.33	6.00	9.24	NS
Synthesis	HPLS - MPLS	1.76	2.00	2.37	6.00	9.24	NS
	HPLS - LPLS	1.76	1.74	0.01	6.08	9.42	NS
	MPLS - LPLS	2.00	1.74	3.00	6.00	at (0.75) 2.78	0.75
Achievement in Social Sciences (Total Score)	HPLS - MPLS	26.93	25.47	2.50	6.00	9.24	NS
	HPLS - LPLS	26.93	21.75	11.40	6.08	9.42	0.01
	MPLS - LPLS	25.47	21.75	13.99	6.00	9.24	0.01
Achievement in Social Sciences (Total Score)	HDAS - MDAS	28.02	25.23	9.72	6.00	9.24	0.01
	HDAS - LDAS	28.02	22.41	24.66	6.08	9.42	0.01
	MDAS - LDAS	25.23	22.41	10.00	6.00	9.24	0.01

HDAS - Highly Desirable Approaches to Studying
MDAS - Moderately Desirable Approaches to Studying
LDAS - Less Desirable Approaches to Studying
HPLS - Highly Preferred Learning Style
MPLS - Moderately Preferred Learning Style
LPPS - Less Preferred Learning Style

NS - Not Significant

Table 4.17 reveals that in the objective - Knowledge the F-ratio obtained for all the three groups based on Approaches to Studying are greater than the F^1 required to be significant at 0.01 level. All the three groups compared with respect to Approaches to Studying *differ significantly* in mean achievement scores in the objective - Knowledge.

In the objective - Comprehension the F-ratio reported for the two groups based on Learning Style viz., HPLS - MPLS ($F = 9.34$, $F^1 = 9.24$, $df = 2$, 531) and HPLS - LPLS ($F = 16.79$, $F^1 = 9.42$, $df = 2$, 166) revealed significant mean differences at 0.01 level. But for the group MPLS - LPLS ($F = 7.48$, $F^1 = 6.00$, $df = 2$, 516) the mean difference is at 0.05 level. It shows that all the three groups of Learning Style *differ significantly* in mean achievement scores in the objective - Comprehension.

In the objective - Application, Approaches to Studying yielded significant F-values. Out of the three groups based on Approaches to Studying the HDAS - MDAS group ($F = 7.76$, $F^1 = 6.00$, $df = 2$, 506) reported significant mean difference at 0.05 level and the HDAS - LDAS group ($F = 9.66$, $F^1 = 9.42$, $df = 2$, 200) at 0.01 level. But the F-ratio obtained for the group MDAS - LDAS ($F = 1.33$, $F^1 = 6.00$, $df = 2$, 507) is not greater than the values of F^1 required to be significant even at 0.05 level. It shows that the mean achievement scores in Application *significantly differ* for the groups HDAS - MDAS and HDAS - LDAS.

The F-ratio obtained when the group means in the objective - Synthesis were compared, the pair MPLS - LPLS was found significant at 0.75 level ($F = 3.00$, $F^1 = 2.78$, $df = 2$, 519). At the same time, the F-ratio recorded by the group HPLS - MPLS ($F = 2.37$, $F^1 = 6.00$, $df = 2$, 506) and

HPLS - LPPS ($F = 0.01$, $F^1 = 6.08$, $df - 2, 166$) are not found significant. Thus the group MPLS - LPLS *differ significantly* in the mean achievement scores for the objective Synthesis.

The Independent Variables Learning Style and Approaches to Studying recorded significant F-values in Achievement in Social Sciences (Total Score). Among the three groups based on Learning Style, HPLS - LPLS group ($F = 11.40$, $F^1 = 9.42$, $df - 2, 169$) and MPLS - LPLS group ($F = 13.99$, $F^1 = 9.24$, $df - 2, 516$) obtained F-ratios greater than the values of F^1 required to be significant at 0.01 level. But the F-ratio for the group HPLS - MPLS ($F = 2.50$, $F^1 = 6.00$, $df - 2, 531$) is not found significant even for the critical value at 0.05 level. It reveals that the groups HPLS - LPLS and MPLS - LPLS *differ significantly* in the mean achievement scores in Social Sciences (Total Score).

Table 4.17 shows that all the three groups based on Approaches to Studying showed significant F-ratios in Total Score in Social Sciences. The F-ratios of HDAS - MDAS group ($F = 9.72$, $F^1 = 9.24$, $df - 2, 506$), HDAS - LDAS group ($F = 24.66$, $F^1 = 9.42$, $df - 2, 200$) and MDAS - LDAS group ($F = 10.00$, $F^1 = 9.24$, $df - 2, 504$) are greater than the values of F^1 required to be significant at 0.01 level. It is thus clear that all the three groups of Approaches to Studying *differ significantly* in their mean achievement scores in Social Sciences (Total Score).

4.2.7. Analysis of Variance for Achievement in Social Sciences (Objective wise and Total Score) for Urban Sample (N = 306)

Three-way ANOVA was executed on Urban Sample to find out the influence of Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) of Pupils Studying in Urban Schools. Summary of Three-way ANOVA for Urban Sample is presented in Table 4.18.

TABLE 4.18

**Summary of Three-way ANOVA
for Achievement in Social Sciences (Objective wise
and Total Score) By Learning Style By Approaches
to Studying By Classroom Climate for Urban Sample (N = 306)**

Dependent Variable	Sources of Variation	Main Effects			Two-way interaction			Three-way interaction
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
KNOWLEDGE	SS	6.29	47.99	1.59	22.98	31.44	21.12	50.09
	df	2	2	2	4	4	4	8
	MS	3.14	23.99	0.795	5.75	7.86	5.28	6.26
	F	0.507	3.869*	0.128	0.926	1.267	0.851	1.009
COMPREHENSION	SS	18.37	82.36	22.48	33.54	91.72	58.65	148.97
	df	2	2	2	4	4	4	8
	MS	9.18	41.18	11.24	8.38	22.93	14.66	18.62
	F	0.505	2.265	0.618	0.461	1.261	0.807	1.024
APPLICATION	SS	1.15	16.43	2.88	20.29	19.82	18.42	36.33
	df	2	2	2	4	4	4	8
	MS	0.574	8.22	1.44	5.07	4.95	4.61	4.54
	F	0.138	1.970	0.346	1.217	1.188	1.104	1.089
ANALYSIS	SS	0.833	1.85	2.65	3.90	16.96	3.45	24.78
	df	2	2	2	4	4	4	8
	MS	0.41	0.93	1.33	0.976	4.24	0.86	3.10
	F	0.231	0.514	0.736	0.542	2.352	0.478	1.719
SYNTHESIS	SS	0.85	2.79	1.28	7.23	12.80	5.81	13.46
	df	2	2	2	4	4	4	8
	MS	0.43	1.39	0.64	1.81	3.20	1.45	1.68
	F	0.245	0.801	0.369	1.038	1.84	0.835	0.967
EVALUATION	SS	0.21	0.87	1.74	0.617	2.83	2.48	5.23
	df	2	2	2	4	4	4	8
	MS	0.11	0.43	0.87	0.154	0.71	0.62	0.65
	F	0.068	0.275	0.550	0.098	0.45	0.394	0.414
ACHIEVEMENT IN SOCIAL SCIENCES (TOTAL SCORE)	SS	58.91	329.56	7.05	203.07	486.39	280.74	400.63
	df	2	2	2	4	4	4	8
	MS	29.45	164.78	3.53	50.77	121.60	70.18	50.08
	F	0.430	2.407	0.052	0.742	1.776	1.025	0.732

LS - Learning Style; AS - Approaches to Studying; CC - Classroom Climate

* $P < 0.05$

4.2.7.1. Main Effects of Independent Variables

Three-way ANOVA for Urban Sample was utilised to examine the main effects of three Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) of Urban Pupils.

Main Effect of Learning Style

Table 4.18 reveals that the F-values obtained for the main effect of Learning Style on Achievement in Social Sciences (Objective wise and Total Score) for Urban Sample are below the table value of 3.02 for the df 2, 279. It shows that the *main effect of Learning Style is not Significant on Achievement in Social Sciences* (Objective wise and Total Score).

Main Effect of Approaches to Studying

As per Table 4.18 the F-ratio obtained for the main effect of Approaches to Studying was found to be significant on the objective wise achievement in Knowledge ($F = 3.869$, $df = 2, 279$, table value - 3.02, $p < 0.05$). This result indicates that *Achievement in the objective - Knowledge changes when the levels of Approaches to Studying change*.

It can also be noted from Table 4.18 that the F-ratios obtained for the main effect of Approaches to Studying on Achievement in the objectives Comprehension (2.265), Application (1.970), Analysis (0.514), Synthesis (0.801) and Evaluation (0.275) and Total Score (2.047) are found below the table value even at 0.05 level. It can be inferred that Achievement in these objectives and Total Score is not changed when the levels of Approaches to Studying change.

Main Effect of Classroom Climate

Table 4.18 further reveals that the F-values obtained for the main effect of Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) are below the tabled value (3.02) for the df - 2,279. Thus it implies that the main effect of Classroom Climate is not significant even at 0.05 level, showing that *Variation in Achievement in Social Sciences (Objective wise and Total Score) is not attributable to variations in the levels of Classroom Climate.*

4.2.7.2. Two-way Interactions

Table 4.18 shows that all the three Two-way interactions (Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate) has no significant F-ratios even at 0.05 level (df - 4,279, table value - 2.39). This shows that the six objective wise achievement and Total *Achievement in Social Sciences of Urban Sample are independent of the combined effect of Learning Style x Approaches to Studying, Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate.*

4.2.7.3. Three-way Interaction

Three-way interaction of Learning Style x Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) yielded no significant F-values. The F-ratios were found to be below the tabled value of 1.96 (df - 8, 279, $P < 0.05$).

It is evident from this result that *variation in Achievement in Social Sciences (Objective wise and Total Score) for the Urban Sample is*

independent of the combined effect of Learning Style x Approaches to Studying x Classroom Climate.

4.2.7.4. Graphical Representation of Interactions in Urban Sample

The pattern of relationships between the Independent and Dependent Variables for Urban Sample is presented in Figures 4-17, 4-18 and 4-19. Achievement in Social Sciences (Objective wise and Total Score) is represented as the ordinate and the three levels of Classroom Climate - HFCC, MFCC and LFCC as the abscissa of the graph. The lines of the graph were represented by the three levels of Approaches to Studying - HDAS, MDAS and LDAS. The graph is constructed in the background of the three levels of Learning Style - HPLS, MPLS and LPPS.

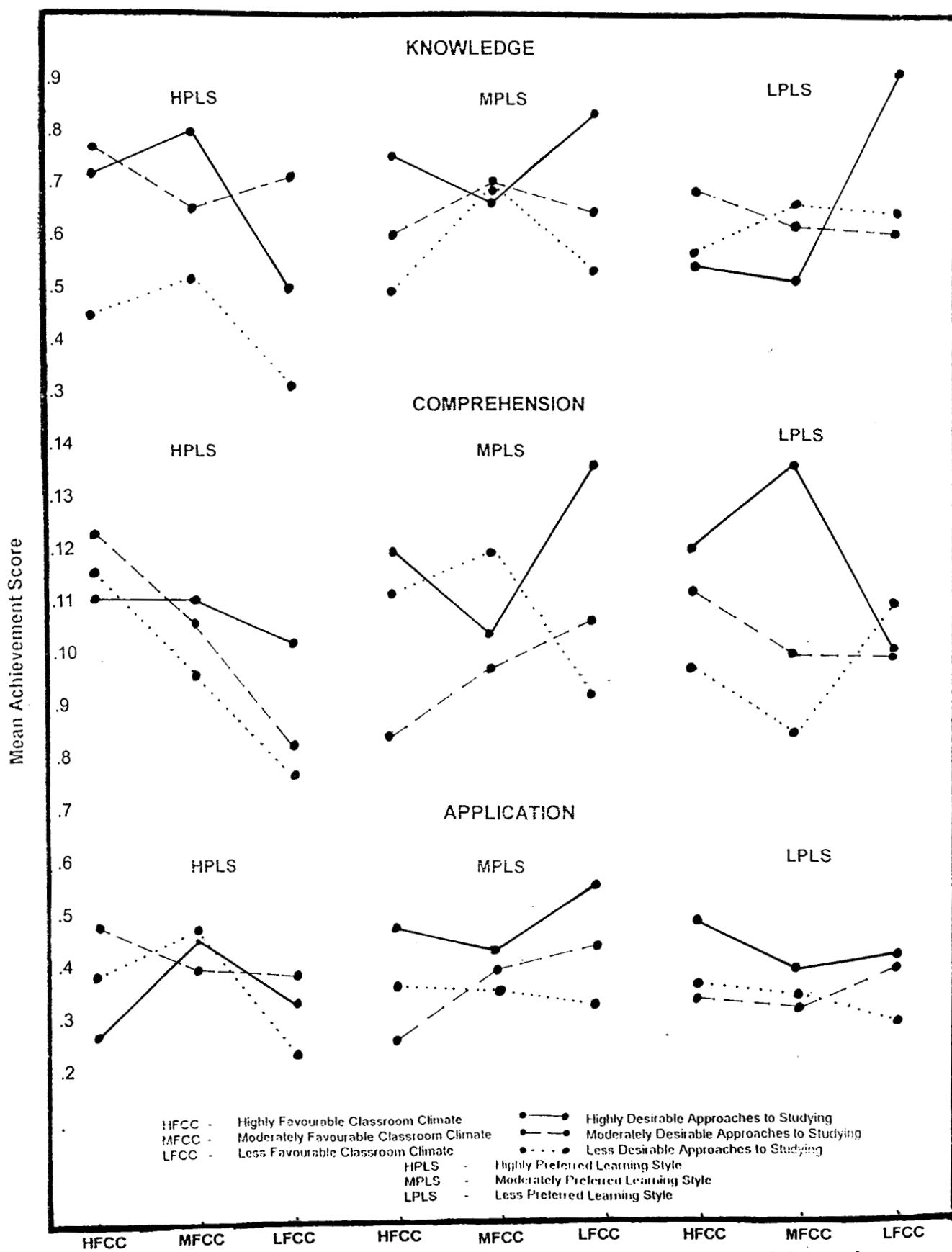


FIGURE 4-17 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Knowledge, Comprehension and Application) for Urban Sample

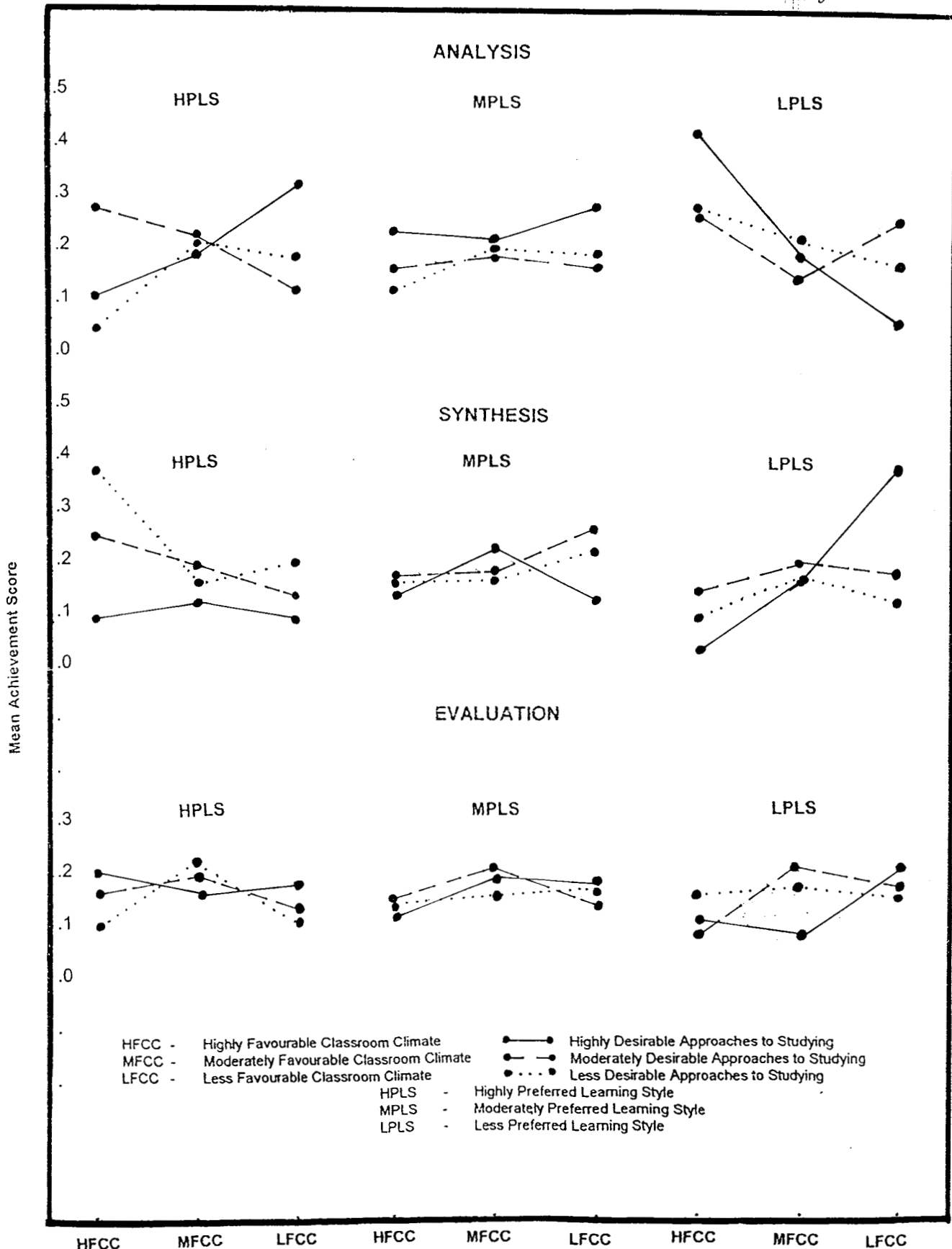


FIGURE 4-18 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Analysis, Synthesis and Evaluation) for Urban Sample

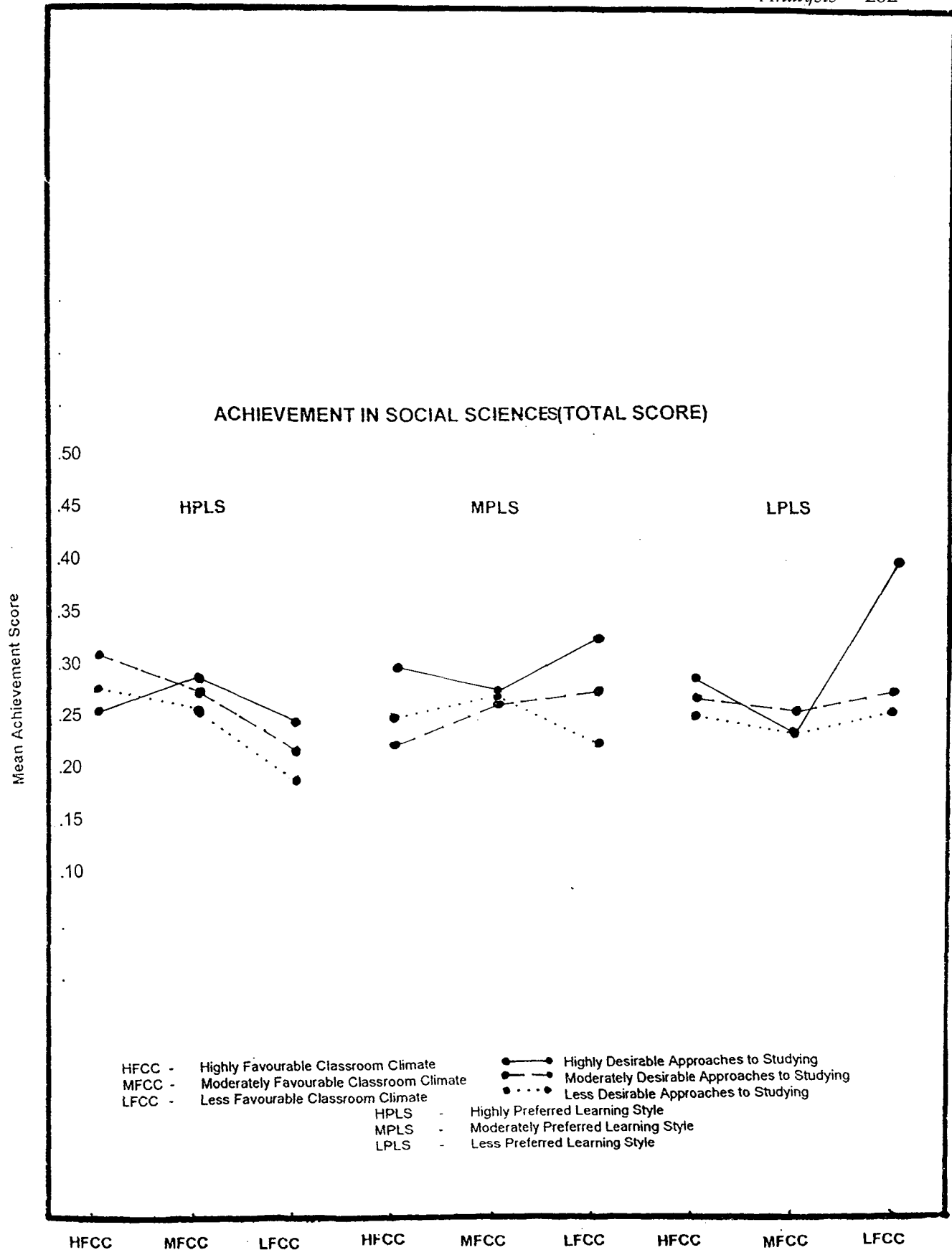


FIGURE 4-19 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Total Score) for Urban Sample

Figure 4-17 gives the graphical representation of the pattern of interaction in the objectives – Knowledge, Comprehension and Application. It can be observed from the graph that in Knowledge, higher level of achievement is attributable to HDAS pupils with LFCC in MPLS and LPLS. But the MDAS pupils are benefitted by HFCC in HPLS and LPLS, while for the LDAS pupils achievement is supported by MFCC.

In the objective Comprehension also HDAS pupils show better performance, but it is contributed differently by the three levels of Classroom Climate. The HFCC helped MDAS pupils to obtain higher achievement scores, while LDAS pupils did not show a specific pattern in their achievements.

In the objective - Application also HDAS pupils received higher achievement scores. For the MDAS pupils the level of achievement is high with LFCC in MPLS and LPLS groups. But the LDAS pupils failed to show any specific pattern in their achievements.

The graphical representation of Achievement in the objectives – Analysis, Synthesis and Evaluation are presented in Figure 4-18. In Analysis, achievement scores are high for HDAS pupils with LFCC in HPLS and MPLS. But MDAS Pupils were benefitted by HFCC in HPLS and LPLS groups. At the same time MFCC supported LDAS pupils to achieve higher scores.

In the objective Synthesis HDAS pupils showed better performance with MFCC, while MDAS pupils were benefitted by LFCC in MPLS and LPLS. But no common trend in achievement is visible for LDAS pupils.

The pattern of relationship in Evaluation reveals that MDAS pupils obtained high achievement scores with MFCC in all the three levels of Learning Style. But the HDAS and LDAS pupils did not show any common trend in achievement.

Pattern of interaction for Achievement in Social Sciences (Total score) is presented in Figure 4-19. The graph shows that Achievement in Social Sciences (Total Score) is high for HDAS pupils with LFCC when preferred MPLS and LPLS. For the pupils who adopted MDAS higher achievement scores were offered by HFCC in HPLS and LPLS. But no common trend in the pattern of achievement for LDAS pupils is visible in the graph.

The pattern of relationships presented graphically for the Urban Sample shows that *pupils with Highly Desirable Approaches to Studying generally obtained high achievement scores*. Though the pattern of achievement varies along with different levels of Classroom Climate LFCC and LPLS could be identified as the most contributing levels for high achievement with HDAS.

4.2.7.5. *Post-hoc Comparison of Group Means*

Three-way ANOVA for Urban Sample revealed that the Independent Variable, Approaches to Studying has a significant main effect on the objective wise Achievement in Knowledge ($P < 0.05$). Inorder to find out exactly in which level of Approaches to Studying the significant differences lie, Scheffe' test of Post-hoc comparison was executed.

The mean achievement scores in the objective Knowledge based on the three levels of Approaches to Studying (HDAS - MDAS, HDAS - LDAS

and MDAS - LDAS) were compared and results examined. Results of Post-hoc comparison is presented in Table 4.19.

TABLE 4.19

**Results of Scheffe' Test of Post -hoc
Comparison Between Means of Achievement in
Social Sciences (Objective wise and Total Score) Based on
Three Groups of Approaches to Studying for Urban Sample (N = 306)**

Dependent Variable	Groups Compared	Means		F	Values of F ¹		Level of Significance
		M ₁	M ₂		0.05	0.01	
Knowledge	HDAS - MDAS	7.73	7.16	1.90	6.04	9.32	NS
	HDAS - LDAS	7.73	6.41	6.96	6.14	9.58	0.05
	MDAS - LDAS	7.16	6.41	3.93	6.04	9.32	NS

HDAS - Highly Desirable Approaches to Studying
MDAS - Moderately Desirable Approaches to Studying
LDAS - Less Desirable Approaches to Studying

Table 4.19 shows that when the mean achievement score in the objective - Knowledge was compared, the pair HDAS - LDAS ($F = 6.96$) reported significant mean differences ($P < 0.05$) as the F-value is greater than the values of F¹ required to be significant. Hence it can be noted that the groups HDAS - LDAS *differ significantly* in their mean achievement scores in the objective Knowledge.

4.2.8. Analysis of Variance for Achievement in Social Sciences (Objective wise and Total Score) for Government Sample (N=314)

In order to find out the effect of Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) of pupils studying in Government Schools, Three-way ANOVA was executed. Summary of Three-way ANOVA for Government Sample is presented in Table 4.20.

TABLE 4.20

**Summary of Three-way ANOVA
for Achievement in Social Sciences (Objective wise
and Total Score) By Learning Style By Approaches
to Studying By Classroom Climate for Government Sample (N = 314)**

Dependent Variable	Sources of Variation	Main Effects			Two-way interaction			Three-way interaction
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
KNOWLEDGE	SS	33.65	24.53	14.42	22.69	62.48	11.63	26.15
	df	2	2	2	4	4	4	8
	MS	16.82	12.67	7.21	5.67	15.62	2.908	2.29
	F	2.702	1.970	1.158	0.911	2.509*	0.467	0.525
COMPREHENSION	SS	77.91	5.96	74.89	68.61	145.53	9.98	145.87
	df	2	2	2	4	4	4	8
	MS	38.96	2.98	37.45	17.15	36.38	2.49	18.23
	F	2.185	0.167	2.100	0.962	2.041	0.140	1.023
APPLICATION	SS	27.61	7.58	23.32	12.02	37.68	6.02	14.44
	df	2	2	2	4	4	4	8
	MS	13.80	3.79	11.66	3.01	9.42	1.51	1.81
	F	3.00	0.849	2.612	0.673	2.110	0.337	0.404
ANALYSIS	SS	1.22	5.78	4.48	10.26	4.04	10.19	13.72
	df	2	2	2	4	4	4	8
	MS	0.61	2.89	2.24	2.56	1.01	2.55	1.71
	F	0.364	1.721	1.334	1.53	0.601	0.516	1.02
SYNTHESIS	SS	4.43	1.49	10.79	12.01	13.65	3.98	28.98
	df	2	2	2	4	4	4	8
	MS	2.21	0.75	5.39	3.00	3.41	0.99	3.62
	F	1.270	0.428	3.00	1.718	1.95	0.57	2.07*
EVALUATION	SS	7.29	1.11	3.25	5.16	3.27	2.15	5.74
	df	2	2	2	4	4	4	8
	MS	3.64	0.55	1.62	1.29	0.82	0.54	0.72
	F	2.39	0.364	1.06	0.85	0.54	0.35	0.47
ACHIEVEMENT IN SOCIAL SCIENCE (TOTAL SCORE)	SS	576.18	119.75	335.89	367.18	861.51	75.43	542.70
	df	2	2	2	4	4	4	8
	MS	288.09	59.87	167.95	91.79	215.38	18.86	67.84
	F	4.139*	0.86	2.413	1.32	3.095*	0.271	0.97

LS - Learning Style; AS - Approaches to Studying; CC - Classroom Climate

* P < 0.05

4.2.8.1. Main Effects of Independent Variables

The main effects of three Independent Variables on Dependent Variables for Government Sample were studied and the results are discussed.

Main Effect of Learning Style

As per Table 4.20 the main effect of Learning Style is found significant on Total Achievement in Social Sciences ($F = 4.139$, $df = 2, 287$, Table value = 3.02, $P < 0.05$). It can be noted from the results that *Achievement in Social Sciences (Total Score) vary when the levels of Learning Style change.*

F-ratios obtained for the objectives - Knowledge (2.702), Comprehension (2.185), Application (3.00), Analysis (0.364), Synthesis (1.270) and Evaluation (2.39) are found to be less than the tabled value even at 0.05 level. This results show that Achievement in these objectives for Government Sample is *not affected by the changes in the levels of Learning Style.*

Main Effect of Approaches to Studying

Table 4.20 shows that all the F-values obtained for the main effect of Approaches to Studying on Achievement in Social Sciences (Objective wise and Total Score) for Government Sample are found not significant. All values are below the table value (3.02) even at 0.05 level ($df = 2, 287$). This results indicate that *Achievement in Social Sciences (Objective wise and Total Score) for Government Sample is independent of the changes in the levels of Approaches to Studying.*

Main Effect of Classroom Climate

As per Table 4.20 the F-values obtained for the main effect of Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) were also not found significant even at 0.05 level for df - 2, 287. It points out that the *Achievement in Social Sciences* (Objective wise and Total Score) is *no way influenced by the variations in the levels of Classroom Climate*.

4.2.8.2. Two-way Interactions

Of the three Two-way Interactions (Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate) significant F-values were obtained by the Two-way interactions of Learning Style x Classroom Climate for Achievement in the objective - Knowledge ($F = 2.509$, df - 4,287, table value = 2.39) and Total score ($F = 3.095$, df - 4,287, table value = 2.39) at 0.05 level. It shows that the *combined effect of Learning Style and Classroom Climate can change the Achievement in Social Sciences* (Knowledge and Total Score).

On all the other objectives viz., Comprehension, Application, Analysis, Synthesis and Evaluation no significant F-value for the interaction of Learning Style x Classroom Climate is noticed. It can be assumed that Achievement in these objectives is *independent* of the combined effect of Learning Style x Classroom Climate.

No significant interaction effect of Learning Style x Approaches to Studying and Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) even at

0.05 level is found, as the obtained F-values were below the tabled value of 2.39 for the df - 4, 287. This helps to infer that the *Combined effect of Learning Style x Approaches to Studying and Approaches to Studying x Classroom Climate cannot influence the Achievement in Social Sciences* (Objective wise and Total Score).

4.2.8.3. Three-way Interaction

Significant Three-way interaction of Learning Style x Approaches to studying x Classroom Climate on the objective wise achievement in Synthesis was obtained ($F = 2.07$, df - 8,287, table value = 1.96, $P < 0.05$). It can be noted from the results that *Achievement in the objective - Synthesis is subjected to change by the combination of three variables - Learning Style, Approaches to Studying and Classroom Climate*.

On the other objectives F-ratios obtained for the interaction effect of Learning Style x Approaches to Studying x Classroom Climate are found not significant even at 0.05 level. It reveals that the *Three-way interaction of Learning Style x Approaches to Studying x Classroom Climate has no joint effect on Achievement in these objectives*.

4.2.8.4. Graphical Representation of Interactions in Government sample

The pattern of relationships between Independent and Dependent Variables for Government Sample has been studied and presented graphically in Figures 4-20, 4-21, and 4-22.

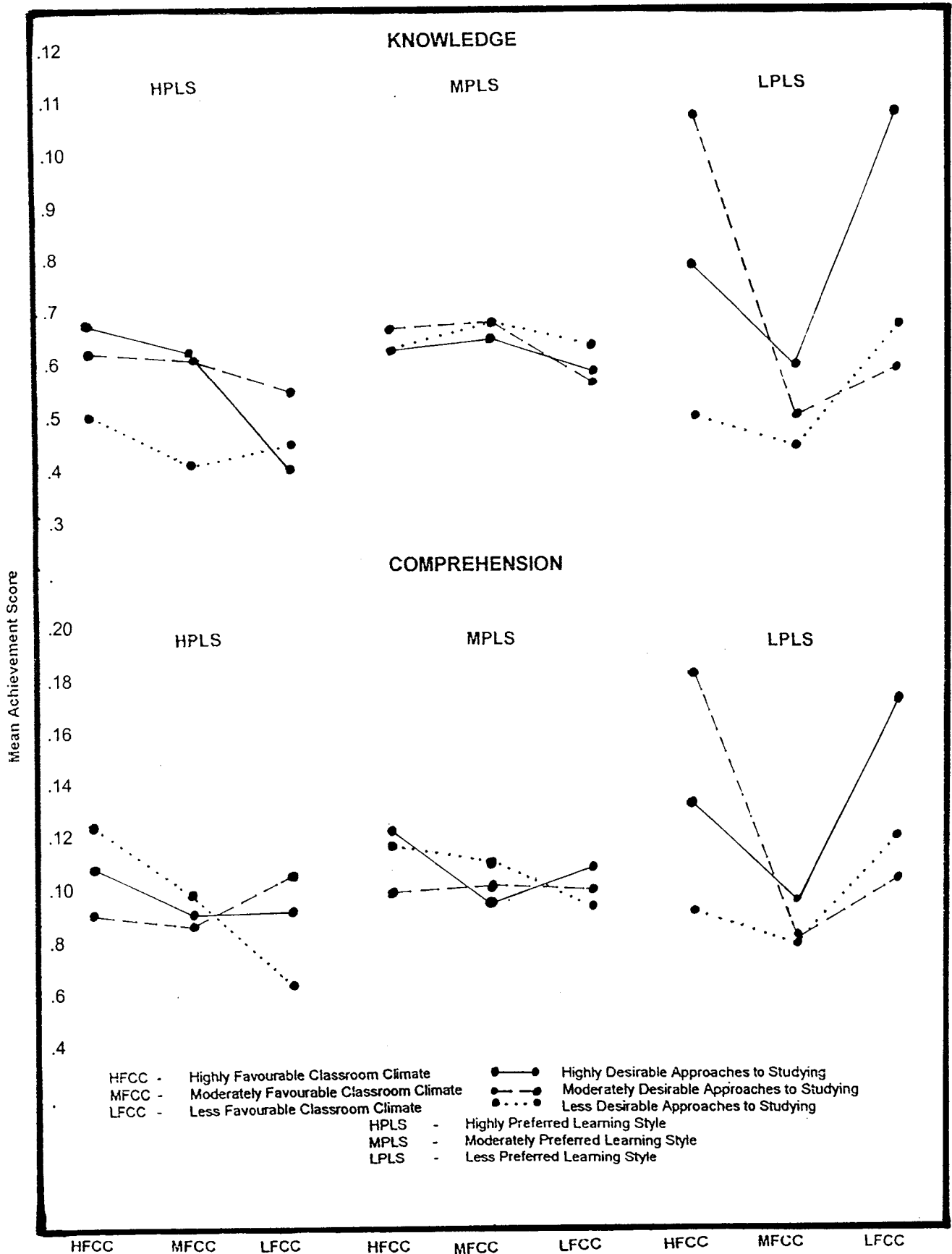


FIGURE 4-20 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Knowledge and Comprehension) for Government Sample

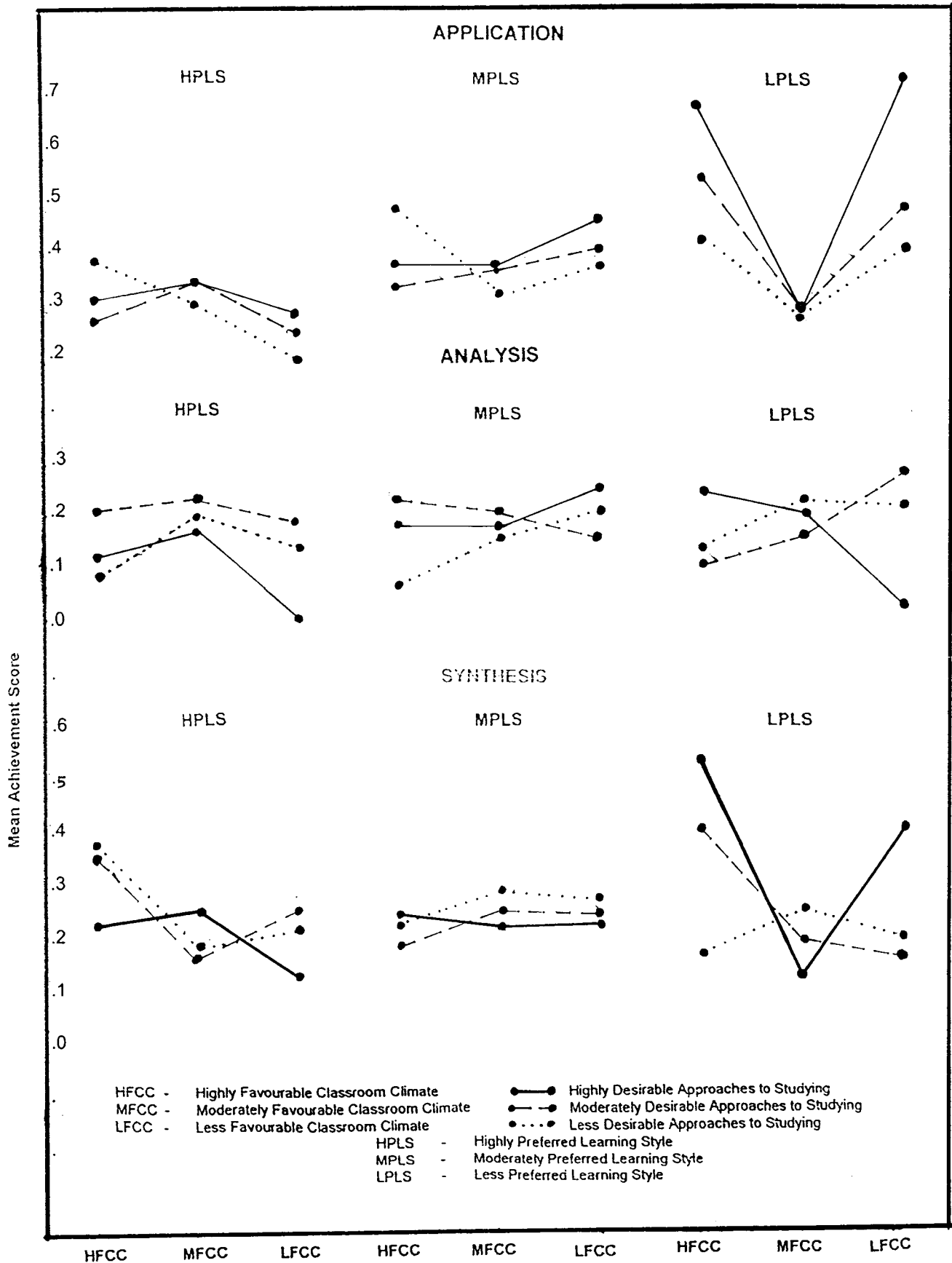


FIGURE 4-21. Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Application, Analysis and Synthesis) for Government Sample

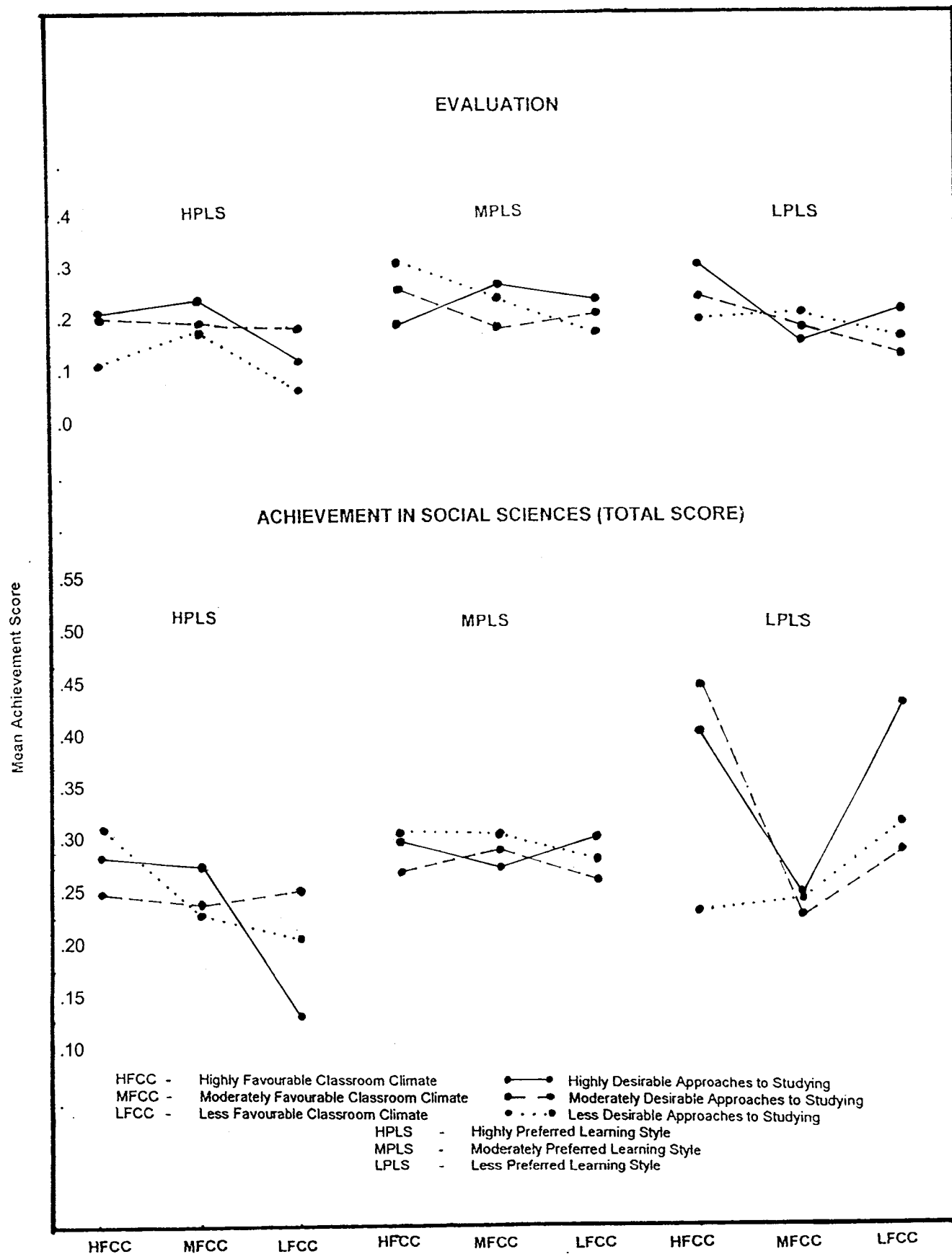


FIGURE 4-22. Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objective - Evaluation and Total Score) for Government Sample

The mean scores of Achievement in Social Sciences (Objective wise and Total Score) has been plotted as the ordinate and the three levels of Classroom Climate - HFCC, MFCC and LFCC as the abscissa of the graph. The Three levels of Approaches to Studying - HDAS, MDAS and LDAS are represented by the lines of the graph. The background of the graph is the three levels of Learning Style - HPLS, MPLS and LPLS.

Figure 4-20 shows the graphical representation of objective wise Achievement in Knowledge and Comprehension. In Knowledge no common trend in the pattern of achievement is visible. High achievement scores can be observed for LPLS pupils. Here the HDAS pupils with LFCC and MDAS pupils with HFCC obtained high mean scores.

In Comprehension also high performance can be noted for pupils who adopted LPLS. When HFCC supported MDAS pupils LFCC supported HDAS pupils to achieve high scores. In HPLS and MPLS, HFCC contributed high achievement scores for HDAS and LDAS pupils.

Graphical representations of interactions in the objectives - Application, Analysis and Synthesis are presented in Figure 4-21. LPLS offered high achievement scores in Application also. HDAS pupils with LFCC and MDAS pupils with HFCC showed high performance in LPLS. LDAS pupils were also benefitted by HFCC in HPLS and MPLS.

In the objective Analysis the graph reveals that MDAS pupils show better performance in all the three levels of Learning Style with differentiated contributions of the three levels of Classroom Climate.

Higher level of performance can be seen once again for the LPLS pupils in the objective Synthesis. Here HFCC helped HDAS and MDAS pupils to achieve high scores. In HPLS and MPLS pupils with LDAS obtained higher achievement scores.

As per Figure 4-22 in Evaluation better performance can be observed for pupils with HDAS when adopted MFCC in HPLS and MPLS. But HFCC supported MDAS pupils to achieve high scores.

The pattern of relationships as given in Figure 4-22 for Total Achievement in Social Sciences reveals *high level of achievement* for pupils who adopted LPLS. When HFCC favoured MDAS pupils HDAS pupils were supported by LFCC to show high performance. HFCC offered high scores for HDAS and LDAS pupils in HPLS and MPLS.

Graphical representation of interactions for Government Sample shows *varying patterns* across the objective wise scores and Total Achievement in Social Sciences. But the general trend is that the pupils who preferred HDAS and LFCC with LPLS are showing *better performances*.

4.2.8.5. *Post-hoc Comparison of Group Means*

Results of Three-way ANOVA for Government Sample revealed that the Independent Variable Learning Style has significant main effect on Achievement in Social Sciences (Total Score, $P < 0.05$). Group means are compared using Scheffe' test of Post-hoc comparison.

The mean achievement scores based on three levels of Learning Style (HPLS, MPLS & LPLS) were compared and results examined. Results of the Post-hoc comparison are summarised in Table 4.21.

TABLE 4.21

**Results of Scheffe' Test of Post -hoc
Comparison Between Means of Achievement in
Social Sciences (Objective wise and Total Score) Based on
Three Groups of Learning Style for Government Sample (N = 306)**

Dependent Variable	Groups Compared	Means		F	Values of F ¹		Level of Significance
		M ₁	M ₂		0.10	0.05	
Achievement in Social Sciences (Total Score)	HPLS - MPLS	23.64	26.25	4.70	4.60	6.04	0.10
	HPLS - LPLS	23.64	23.82	0.14	5.54	6.18	NS
	MPLS - LPLS	26.26	23.82	3.13	4.60	6.04	NS

HPLS - Highly Preferred Learning Style

MPLS - Moderately Preferred Learning Style

LPLS - Less Preferred Learning Style

Table 4.21 reveals that the mean achievement scores in Social Sciences (Total Score) when compared the groups HPLS - MPLS yielded significant group difference ($F = 4.70$) at 0.10 level of significance. Thus the results of Post-hoc comparison for Government sample show that the group HPLS - MPLS *differentiates* with regard to the mean Achievement scores in Social Sciences.

4.2.9. Analysis of Variance for Achievement in Social Sciences (Objective wise and Total Score) for Private Sample (N = 603)

To examine the influence of Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) for the pupils studying in Private Schools Three-way ANOVA is carried out. Sums of squares, mean square variance and the corresponding degrees of freedom were calculated. Summary of 3 x 3 x 3 ANOVA is presented in Table 4.22.

TABLE 4.22

**Summary of Three-way ANOVA
for Achievement in Social Sciences (Objective
wise and Total Score) By Learning Style By Approaches
to Studying By Classroom Climate for Private Sample (N = 603)**

Dependent Variable	Sources of Variation	Main Effects			Two-way interaction			Three-way interaction
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
KNOWLEDGE	SS	29.39	68.39	0.84	45.59	21.92	20.36	57.26
	df	2	2	2	4	4	4	8
	MS	14.69	34.19	0.42	11.40	5.48	5.10	7.16
	F	2.71	6.31**	0.078	2.10	1.01	0.94	1.32
COMPREHENSION	SS	253.51	11.76	42.35	151.69	36.68	53.83	163.77
	df	2	2	2	4	4	4	8
	MS	126.76	5.58	21.17	37.92	9.17	13.46	20.47
	F	7.69**	0.36	1.28	2.30	0.56	0.82	1.24
APPLICATION	SS	68.96	32.11	1.92	15.04	8.64	23.20	17.12
	df	2	2	2	4	4	4	8
	MS	34.48	16.05	0.96	3.76	2.16	5.80	2.14
	F	7.96**	3.71*	0.22	0.87	0.50	1.34	0.49
ANALYSIS	SS	2.09	0.92	4.47	3.92	1.56	10.47	16.93
	df	2	2	2	4	4	4	8
	MS	1.04	0.46	2.24	0.98	0.39	2.62	2.12
	F	0.56	0.25	1.20	0.53	0.21	1.41	1.14
SYNTHESIS	SS	2.06	0.09	2.05	2.22	2.15	1.62	18.61
	df	2	2	2	4	4	4	8
	MS	1.03	0.04	1.02	0.56	0.56	0.40	2.33
	F	0.58	0.02	0.58	0.31	0.30	0.23	1.31
EVALUATION	SS	4.11	6.71	1.57	10.71	7.25	1.25	9.65
	df	2	2	2	4	4	4	8
	MS	2.05	3.35	0.78	2.68	1.81	0.31	1.21
	F	1.26	2.05	0.48	1.64	1.11	0.19	0.74
ACHIEVEMENT IN SOCIAL SCIENCES (TOTAL SCORE)	SS	115.50	211.13	64.84	531.27	184.235	136.78	602.67
	df	2	2	2	4	4	4	8
	MS	577.75	105.57	32.42	132.82	46.06	34.19	75.33
	F	9.13**	1.67	0.51	2.10	0.73	0.54	1.19

LS - Learning Style; AS – Approaches to Studying; CC - Classroom Climate

* P < 0.05; ** P < 0.01

4.2.9.1. Main Effects of Independent Variables

This section deals with the description of the main effect of three Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) for Private Sample.

Main Effect of Learning Style

The main effect of Learning Style on Achievement in Social Sciences (Objective wise and Total Score) for Private Sample is presented in Table 4.22. The main effects of Learning Style in the objective - Comprehension ($F = 7.69$), Application ($F = 7.96$) and Total Score ($F = 9.13$) are found to be significant at 0.01 level for $df = 2, 576$ (table value = 4.62). These results imply that the *Achievement in Social Sciences* (Comprehension, Application and Total Score) *varies when the levels of Learning Style change*.

It can also be noted from Table 4.22 that the main effect of Learning Style on objective wise achievement in Knowledge ($F = 2.71$), Analysis ($F = 0.56$), Synthesis ($F = 0.58$) and Evaluation ($F = 1.26$) was found to be not significant even at 0.05 level as the F-values were below the tabled value of 3.00. It can be inferred that *Achievement in these objectives is not changeable when the levels of Learning Style change*.

Main Effect of Approaches to Studying

Significant F-ratios for the main effect of Approaches to Studying were found on the objective wise Achievement in Knowledge ($F = 6.31$, $df = 2, 576$, table value = 4.62, $P < 0.01$) and Application ($F = 3.71$, $df = 2, 576$, table value = 3.00, $P < 0.05$). This result is indicative of the fact that the

Achievement in the objectives - Knowledge and Application is subjected to changes when the levels of Approaches to Studying change.

It can also be observed from Table 4.22 that the F-ratios obtained for the Achievement in the objectives - Comprehension (0.36), Analysis (0.25), Synthesis (0.02), Evaluation (2.05) and Total Score (1.67) are below the tabled value of 3.00 to be significant at 0.05 level. It points out that *Achievement in these objectives and Total Score is independent of the changes in the levels of Approaches to Studying.*

Main Effect of Classroom Climate

No significant main effect of Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) was reported as per Table 4.22 even at 0.05 level as the obtained F-values are below the tabled value of 3.00 for df 2,576. It can be assumed from the results that the *Achievement in Social Sciences* (Objective wise and Total Score) *is not affected by the changes in the levels of Classroom Climate.*

4.2.9.2. Two-way Interactions

Table 4.22 reveals the F-value of two-way interactions of Learning Style x Approaches to Studying; Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score). In all the three two-way interactions no significant F-ratio is reported even at 0.05 level as the F-values are below the tabled value of 2.39 for the df - 4,576. These results reveal that *Achievement in Social Sciences* (Objective wise and Total Score) *is independent of variations in the variables Learning Style x Approaches*

to Studying, Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate in combination of the two.

4.2.9.3. Three-way Interaction

As per Table 4.22 no significant F-ratio was found for the three-way interaction of Learning Style x Approaches to Studying x Classroom Climate on Achievement in Social Sciences (Objective wise and Total Score) for Private Sample. All the F-ratios obtained were found to be below the tabled value required for significance at 0.05 level (Table value - 1.95, df - 8, 576).

It is evident from the results that the *variation in Achievement in Social Sciences* (Objective wise and Total Score) *for Private Sample is independent of the combined effect of the variables Learning Style x Approaches to Studying x Classroom Climate.*

4.2.9.4. Graphical Representation of Interactions in Private Sample

The graphical pattern of relationship between Independent and Dependent Variables has been presented in Figures 4-23, 4-24, and 4-25. On the graphs the mean achievement scores of Dependent Variables have been plotted as the ordinate and the three levels of Classroom Climate (HFCC, MFCC and LFCC) as the abscissa. The lines of the graph represented the three levels of Approaches to Studying (HDAS, MDAS & LDAS) and the background of the graphs are treated the three levels of Learning Style (HPLS, MPLS & LPLS).

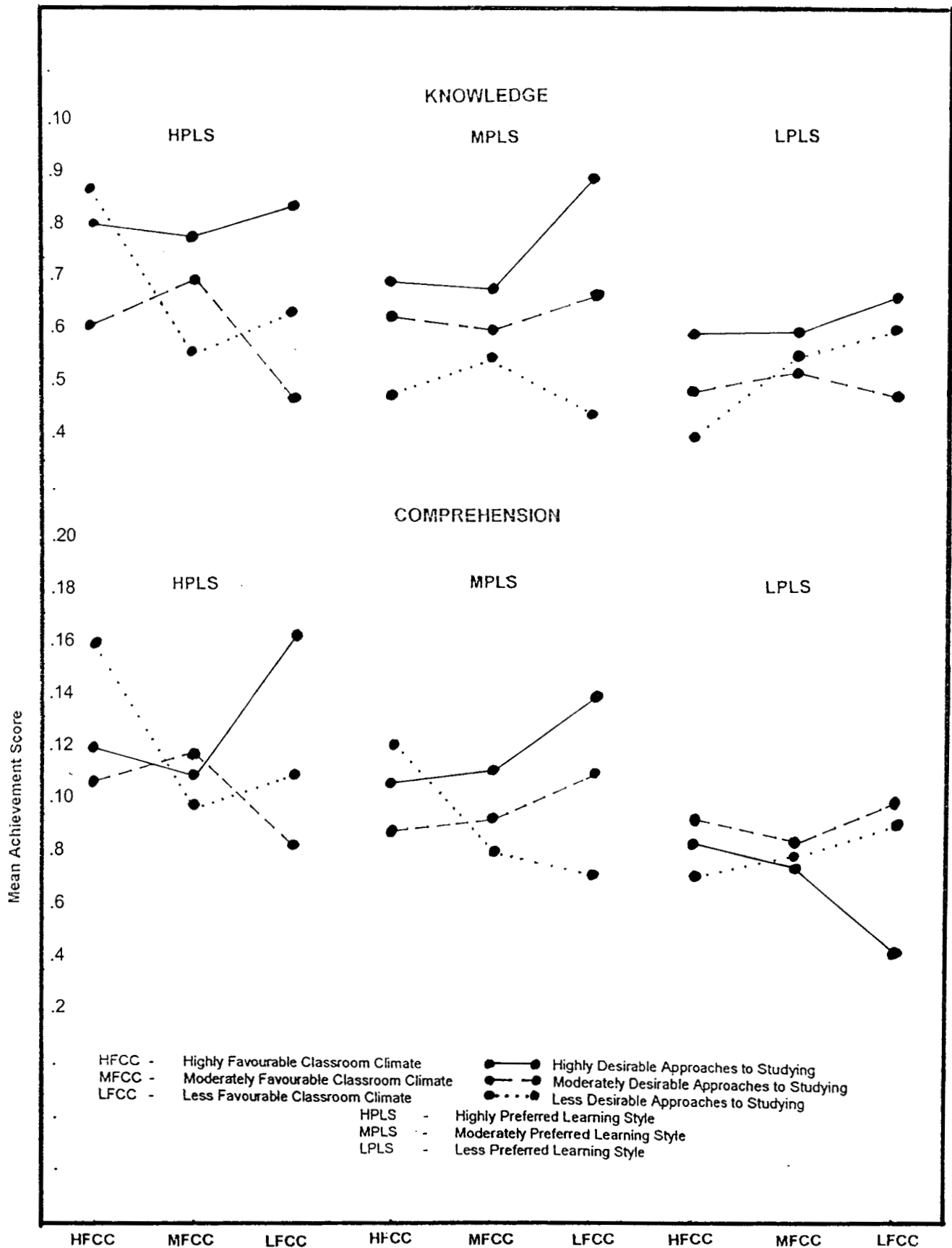


FIGURE 4-23 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Knowledge and Comprehension) for Private Sample

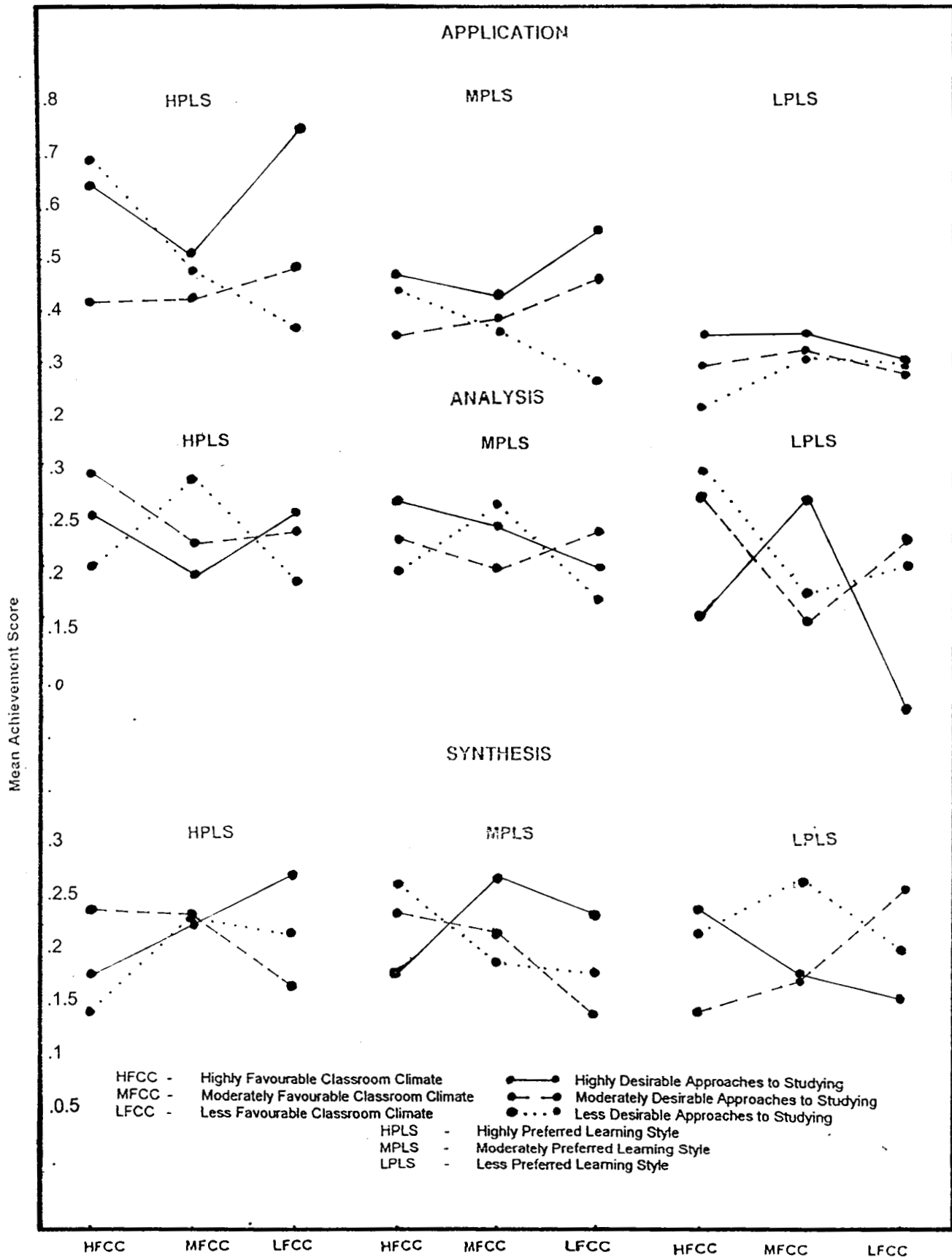


FIGURE 4-24 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Application, Analysis and Synthesis) for Private Sample

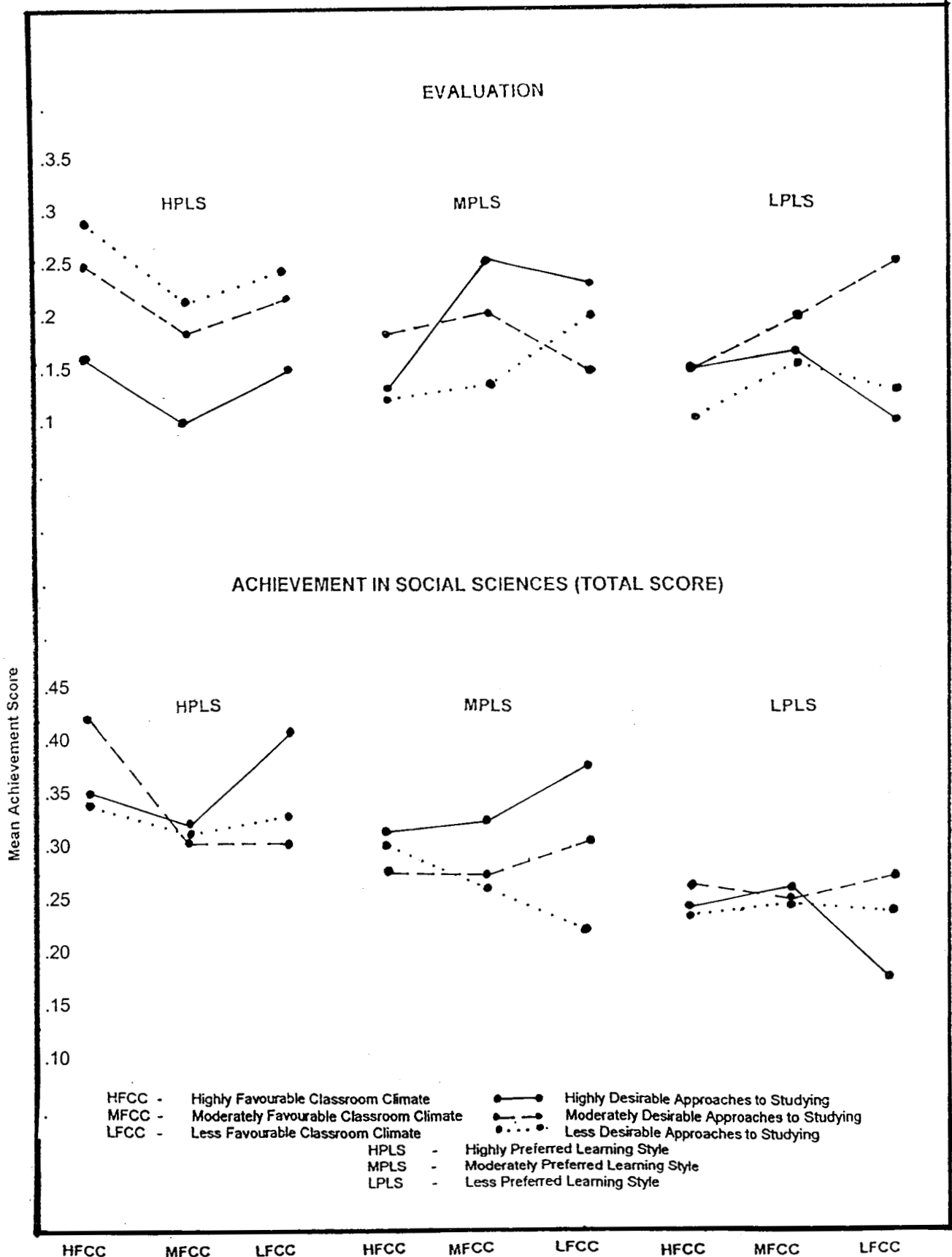


FIGURE 4-25 Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectives - Evaluation and Total Score) for Private Sample

Figure 4-23 gives the graphical representations of the pattern of relationships in the objectives - Knowledge and Comprehension. In the objective - Knowledge higher level of achievement is attributable to HDAS pupils with LFCC. However LDAS pupils obtained high scores with HFCC when adopted HPLS.

In Comprehension also LDAS pupils obtained high achievement scores with HFCC and HPLS. But HDAS pupils revealed better performance with LFCC in HPLS and MPLS.

As shown in Figure 4-24 in the objective Application high level of achievement is visible for HDAS pupils. In HPLS and MPLS pupils achieved high scores with HDAS and LFCC. At the same time HFCC supported LDAS pupils to attain higher achievement scores.

In the objective Analysis as per Figure 4-24 the overall achievement of LDAS pupils is higher. The MDAS pupils showed better performance with the help of HFCC when adopted HPLS and LPLS. In the Objective Synthesis also higher level of performance is associated with LDAS pupils in MPLS and LPLS. But HDAS pupils obtained high achievement scores in HPLS with LFCC.

In the graphical representation for the objective Evaluation as shown in Figure 4-25, there is no common trend in the pattern of relationship. High level of performance is visible for LDAS pupils in HPLS, HDAS pupils in MPLS and MDAS pupils in LPLS.

As per Figure 4-25 for Achievement in Social Sciences (Total) high level of achievement can be observed for HDAS pupils with LFCC in HPLS

and MPLS. But the LDAS pupils were supported by HFCC to achieve higher scores in HPLS and MPLS.

The patterns of interactions in Private Sample are different in attainment in Social Sciences (Objective wise and Total score). Even then in Private Sample for the pupils who adopted *Highly Preferred Learning Style, Highly Desirable Approaches to Studying and Highly Favourable Classroom Climate obtained higher scores in Achievement*. However the combination - Highly Preferred Learning Style, Highly Desirable Approaches to Studying and Less Favourable Classroom Climate contributed high level of achievement.

4.2.3.5. Post-hoc Comparison of Group Means

As per Table 4.22 the Three-way ANOVA for Private Sample revealed significant main effects of Learning Style on Achievement in the objectives - Comprehension ($P < 0.01$), Application ($P < 0.01$) and Total Score ($P < 0.01$) and Approaches to Studying on the objectives - Knowledge ($P < 0.01$) and Application (0.05). Scheffe' test of Post-hoc Comparison was used to analyse each possible pair of groups which differentiates significantly with regard to the mean achievement scores. The results of Post-hoc comparisons based on the three levels of Learning Style and Approaches to Studying are presented in Table 4.23.

TABLE 4.23

**Results of Scheffe' Test of Post -hoc
Comparison Between Means of Achievement in Social
Sciences (Objective wise and Total Score) Based on Three Groups
of Learning Style and Approaches to Studying for Private Sample (N = 603)**

Dependent Variable	Groups Compared	Means		F	Values of F ¹		Level of Significance
		M ₁	M ₂		0.05	0.01	
Knowledge	HDAS - MDAS	7.64	6.56	1.49	6.00	9.24	NS
	HDAS - LDAS	7.64	5.68	28.86	6.08	9.42	0.01
	MDAS - LDAS	6.56	5.68	12.28	6.00	9.24	0.01
Compre- hension	HPLS - MPLS	11.63	9.75	17.67	6.00	9.24	0.01
	HPLS - LPLS	11.63	9.11	17.64	6.08	9.42	0.01
	MPLS - LPLS	9.75	9.11	1.70	6.00	9.24	NS
Application	HPLS - MPLS	4.57	3.76	13.12	6.00	9.24	0.01
	HPLS - LPLS	4.57	3.14	22.72	6.08	9.42	0.01
	MPLS - LPLS	3.76	3.14	6.41	6.00	9.24	0.05
Application	HDAS - MDAS	4.64	3.77	10.51	6.00	9.24	0.01
	HDAS - LDAS	4.64	3.43	83.46	6.08	9.42	0.01
	MDAS - LDAS	3.77	3.43	0.035	6.00	9.24	NS
Achievement in Social Sciences (Total Score)	HPLS - MPLS	29.54	25.85	17.68	6.00	9.24	0.01
	HPLS - LPLS	29.54	23.37	57.68	6.08	9.42	0.01
	MPLS - LPLS	25.85	23.37	6.61	6.00	9.24	0.05

NS - Not Significant

HDAS - Highly Desirable Approaches to Studying
MDAS - Moderately Desirable Approaches to Studying
LDAS - Less Desirable Approaches to Studying

HPLS - Highly Preferred Learning Style
MPLS - Moderately Preferred Learning Style
LPLS - Less Preferred Learning Style

As per Table 4.23 when mean achievement scores for the objective - Knowledge were compared the pairs HDAS - LDAS ($F = 28.86$) and MDAS - LDAS ($F = 12.28$) significant mean differences is revealed ($P < 0.01$) as the corresponding F-ratios are greater than the value of F_1 required to be significant. In the objective - Comprehension significant mean differences ($P < 0.01$) are found between the groups HPLS - MPLS ($F = 17.67$) and HPLS - LPLS ($F = 17.64$). In the objective - Application when the mean achievement scores based on Learning Style were compared the groups HPLS - MPLS ($F = 13.12$, $P < 0.01$), HPLS - LPLS ($F = 22.72$, $P < 0.01$) and MPLS - LPLS, ($F = 6.41$, $P < 0.05$) differentiated significantly.

Table 4.23 further shows that in the objective - Application, the mean achievement scores based on Approaches to Studying when compared the groups HDAS - MDAS ($F = 10.51$, $P < 0.01$) and HDAS - LDAS ($F = 83.46$, $P < 0.01$) yielded significant mean differences. For Achievement in Social Sciences (Total Score) the mean achievement scores based on three groups of Learning Style when compared significant group differences were noticed for the groups HPLS - MPLS ($F = 17.68$, $P < 0.01$), HPLS - LPLS ($F = 57.68$, $P < 0.01$) and MPLS - LPLS ($F = 6.61$, $P < 0.05$).

Results of Post-hoc comparison for Private Samples thus revealed that the comparison of group means in the objectives - *Knowledge, Comprehension, Application and Total Achievement in Social Sciences* showed significant group differences.

4.3. DISCUSSION OF THE RESULTS OF ANOVA FOR ACHIEVEMENT

The present study is intended to find out the influence of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils. Keeping this in view, the analysis using Three-way ANOVA was carried out.

The F-values obtained in the Forty Nine Three-way ANOVA conducted (seven for Total sample and seven each for each of the six Sub-samples based on Sex, Locale and Types of Management of the School) are summarised and consolidated in Table 4.24 and the results are discussed.

TABLE 4.24

F-Values for the Main and Interaction Effects of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objectivewise and Total score) for Secondary School Pupils

Sample	Dependent Variable	Main Effects F-Ratios			Two-way Interactions F-Ratios			Three-way Interaction F-Ratios
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
Total (N = 917)	Knowledge	0.769	7.155**	0.036	0.48	1.301	1.032	0.843
	Comprehension	2.228	2.200	0.848	0.232	0.175	0.255	1.136
	Application	1.531	5.134**	0.065	0.454	0.216	0.65	0.641
	Analysis	0.004	1.078	0.93	2.07	0.62	2.799*	1.278
	Synthesis	1.024	1.055	0.00	0.784	1.204	0.762	0.513
	Evaluation	1.283	2.546	1.211	0.677	0.319	0.883	0.727
	Achievement in Social Sciences (Total)	2.385	3.584*	0.247	0.153	0.47	0.114	0.775
Boys (N = 442)	Knowledge	0.394	1.922	0.803	0.227	0.819	1.012	1.097
	Comprehension	1.253	0.482	3.127*	1.383	1.738	1.650	1.277
	Application	1.014	0.589	0.295	0.435	0.433	0.493	0.292
	Analysis	0.32	0.73	2.15	0.74	1.65	1.49	1.65
	Synthesis	0.86	0.18	2.56	0.83	1.45	0.47	1.15
	Evaluation	0.05	0.04	1.97	0.85	1.06	1.18	1.31
	Achievement in Social Sciences (Total)	0.82	0.45	2.26	0.31	1.01	1.34	1.04

contd.....

Sample	Dependent Variable	Main Effects F-Ratios			Two-way Interactions F-Ratios			Three-way Interaction F-Ratios
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
Girls (N = 475)	Knowledge	2.158	3.214*	1.401	0.453	0.655	1.018	0.894
	Comprehension	3.497*	1.298	0.155	0.371	0.625	0.715	1.497
	Application	2.549	3.518*	0.773	0.839	0.728	1.146	0.857
	Analysis	0.236	0.774	0.710	1.414	0.626	0.919	1.198
	Synthesis	0.647	0.005	0.248	0.779	1.153	0.835	0.968
	Evaluation	0.552	2.607	0.373	0.676	0.358	0.887	0.521
	Achievement in Social Sciences (Total)	3.862*	2.696	0.696	0.673	0.694	0.986	0.876
Rural (N = 611)	Knowledge	2.018	7.369*	0.114	0.731	0.168	1.644	0.821
	Comprehension	3.727*	2.094	0.847	1.028	0.716	1.253	1.676
	Application	1.741	4.193*	0.133	0.988	1.356	1.264	0.829
	Analysis	0.182	1.123	0.446	0.678	0.153	1.758	0.679
	Synthesis	3.345*	0.918	0.269	0.835	0.809	1.425	1.552
	Evaluation	1.300	1.742	0.208	1.094	0.435	0.807	0.789
	Achievement in Social Sciences (Total)	3.705*	4.387*	0.511	1.014	0.939	1.139	1.288
Urban (N = 306)	Knowledge	0.507	3.869*	0.128	0.926	1.267	0.851	1.009
	Comprehension	0.505	2.265	0.618	0.461	1.261	0.807	1.024
	Application	0.138	1.970	0.346	1.217	1.188	1.104	1.089
	Analysis	0.231	0.514	0.736	0.542	2.352	0.478	1.719
	Synthesis	0.245	0.801	0.369	1.038	1.84	0.835	0.967
	Evaluation	0.068	0.275	0.550	0.098	0.45	0.394	0.414
	Achievement in Social Sciences (Total)	0.430	2.407	0.052	0.742	1.776	1.025	0.732

contd.....

Sample	Dependent Variable	Main Effects F-Ratios			Two-way Interactions F-Ratios			Three-way Interaction F-Ratios
		LS	AS	CC	LS x AS	LS x CC	AS x CC	LS x AS x CC
Government (N = 314)	Knowledge	2.702	1.970	1.158	0.911	2.509*	0.467	0.525
	Comprehension	2.185	0.167	2.100	0.962	2.041	0.140	1.023
	Application	3.00	0.849	2.612	0.673	2.110	0.337	0.404
	Analysis	0.364	1.721	1.334	1.53	0.601	0.516	1.02
	Synthesis	1.270	0.428	3.00	1.718	1.95	0.57	2.07*
	Evaluation	2.39	0.364	1.06	0.85	0.54	0.35	0.47
	Achievement in Social Sciences (Total)	4.139*	0.86	2.413	1.32	3.095*	0.271	0.97
Private (N = 603)	Knowledge	2.71	6.31**	0.078	2.10	1.01	0.94	1.32
	Comprehension	7.69**	0.36	1.28	2.30	0.56	0.82	1.24
	Application	7.96**	3.71*	0.22	0.87	0.50	1.34	0.49
	Analysis	0.56	0.25	1.20	0.53	0.21	1.41	1.14
	Synthesis	0.58	0.02	0.58	0.31	0.30	0.23	1.31
	Evaluation	1.26	2.05	0.48	1.64	1.11	0.19	0.74
	Achievement in Social Sciences (Total)	9.13**	1.67	0.51	2.10	0.73	0.54	1.19

* $P < 0.05$; ** $P < 0.01$

LS - Learning Style
AS - Approaches to Studying
CC - Classroom Climate

A scrutiny of the summary of Three way ANOVA reveals the following:

1. For the Independent Variable *Learning Style* main effect on Achievement in Social Sciences (Objective wise and Total score) was noticed for Girls, Rural, Government and Private samples. Out of seven ANOVA for each sample *two* for Girls (Comprehension and Total score), *three* for Rural (Comprehension, Synthesis and Total score), *one* for Government (Total score) and *three* for Private Sample (Comprehension, Application and Total score) reported significant F-values. Hence it can be interpreted that variation in Achievement in Social Sciences (in the objectives and Total Achievement in Social Sciences as mentioned earlier) is due to changes in the levels of Learning Style for the sub-samples Girls, Rural, Government and Private. This effect was not observed in the case of Total Sample, Boys and Urban Sub-samples. It indicates that the variation in Achievement in Social Sciences (Objective wise and Total score) for these samples is not depended on changes in the different levels of Learning Style.

This result is in tune with the findings of Leiden, *et al.* (1990), Thompson and O'Brien (1991), Orr and Davidson (1993), Harasym (1995), Howie (1996), Santhosh Kumar (1997), Day, *et al.* (1998) and Marzalek and Lockard (1999) and Seng and Yeo (2000). But this is in contradiction to the findings of Green, *et al.* (1990), Cooper and Miller (1992), Barbara (1993), Dunn and Griggs (1995), Lindvall (1995), Hall and Hyle (1996), Matthews (1996), Rehna (1996), Ikegulu (1997), Kumar (1997a), Burns, *et al.* (1998), Mac Kinnon (1999), Garton, *et al.* (2000) and Dunn, *et al.* (2001).

When group difference was studied with regard to mean achievement scores in Achievement in Social Sciences (Objective wise and Total score), superiority of HPLS group was evident in all the comparisons showing significant mean differences, as high mean achievement was associated with it. MPLS gave a better mean achievement when compared to LPLS.

The graphical representation of interactions also showed higher performance of HPLS group. Marked difference between the extreme groups (HPLS-LPLS) was also observed.

2. In *Approaches to Studying* significant main effect on Achievement in Social Sciences (Objective wise and Total score) was observed for the Total Sample and Sub-samples of Girls, Rural, Urban and Private. Out of seven ANOVA for each sample *three* for Total Sample (Knowledge, Application and Total score), *two* for Girls (Knowledge and Application), *three* for Rural (Knowledge, Application and Total score), *one* for Urban (Knowledge) and *two* for Private (Knowledge and Application) obtained significant F-values. Thus it can be assumed that variation in Achievement in Social Sciences (in the objectives and Total Achievement mentioned here) is due to changes in the levels of Approaches to Studying for the Total Sample and Sub-samples Girls, Rural, Urban and Private. But this effect was not found for the sub-samples Boys and Government. It implies that the variation in Achievement in Social Sciences in these two sub-samples is not caused by changes in the different levels of Approaches to Studying.

It supports the findings of Lyn, *et al.* (1989), Jones and Jones (1996), Rehna (1996) and Provost and Bond (1997). But this result is in

contradiction to the research findings of Duckwall (1990), Ekins (1992), Kumar (1993), Richardson (1995), Kumar (1998), Richardson, *et al.* (1999) and Pimparyon, *et al.* (2000).

When group difference with regard to mean achievement scores in Achievement in Social Sciences (Objectivewise and Total score) was studied the HDAS group was found superior in all comparisons as high mean achievement scores were associated with it. The MDAS group found to have better mean achievement when compared with LDAS.

Graphical representation of interactions also revealed higher level of Achievement for the higher group (HDAS). Marked difference was found to exist between the extreme groups (HDAS-LDAS).

3. In Classroom Climate significant main effect on Achievement in Social Sciences (Objective wise and Total score) was noticed only for Boys sample. Out of *seven* ANOVA the objective Comprehension reported significant F-ratio. It indicates that variation in Achievement in Social Sciences (Objective-Comprehension) is due to changes in the levels of Classroom Climate for Boys. However this effect was not observed for the Total Sample and the other Sub samples viz., Girls, Rural, Urban, Government and Private showing that variation in Achievement in Social Sciences in these samples is not influenced by changes in the different levels of Classroom Climate.

This result goes in tune with the findings of Kumar (1995), Suresan (1997), Dunn and Harris (1998) and Lee, *et al.* (1999). But findings of Weir and May (1990), Short and Short (1991), Pierce (1994), Yuen-Yee (1994), Goh

and Fraser (1995), Narayanan (1996), Sunitha (1997), Hudley (1998) and Bhargavi (1999) are in contradiction to the findings of the present investigation.

Results of the post-hoc comparison revealed that the mean achievement scores in the objective - Comprehension for Boys for the HFCC group was higher. But when MFCC was compared with LFCC higher mean achievement was found with LFCC group.

Graphical representation also showed higher level of performance for HFCC group and marked difference between the extreme groups (HFCC-LFCC).

4. In three Two-way interactions studied, the interaction of *Learning Style* x *Classroom Climate* obtained *two* significant F-ratios for Government Sample (Knowledge and Total score) and *one* significant F-ratio in the Two-way interaction of *Approaches to Studying* x *Classroom Climate* for Total sample in the objective Analysis. So it can be concluded that variation in Achievement in Social Sciences (in these objectives and Total score) is caused by the Two-way interactions of Learning Style x Classroom Climate for Government Sample and Approaches to Studying x Classroom Climate for Total Sample.

But the Two-way interaction of *Learning Style* x *Approaches to Studying* did not obtain significant F-ratio for any sample. The Two-way interaction of Learning Style x Classroom Climate for all samples except Government and the Two-way interaction of Approaches to Studying x Classroom Climate in all Sub-samples did not report significant F-values.

Hence it implies that *variations in Achievement in Social Sciences* (Objectivewise and Total score) *in these samples is not depended on the Two-way interactions* of Learning Style x Approaches to Studying, Learning Style x Classroom Climate and Approaches to Studying x Classroom Climate.

5. In the Three-way interactions of *Learning Style x Approaches to Studying x Classroom Climate* a significant F-ratio was reported only for Government sample in the objective – Synthesis. It indicates that the variation in Achievement in Social Sciences in the objective – Synthesis for Government Sample is caused by the interaction effect of Learning Style x Approaches to Studying x Classroom Climate. But in all the other samples the Three-way interactions did not show significant F-ratios indicating that variations in Achievement in Social Sciences (Objective wise and Total score) is not influenced by the Three-way interaction effect of Learning Style x Approaches to Studying x Classroom Climate.

5. Pattern of interaction effects of Independent Variables on Dependent Variables when studied graphically revealed the following features.

Graphical representation of interactions of three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) revealed *varying patterns* across different objectives.

In Total sample higher level of Achievement can be attributed to the combination of *Highly Preferred Learning Style* (HPLS), *Highly Desirable Approaches to Studying* (HDAS) and *Highly Favourable Classroom Climate* (HFCC). In the Sub-sample Boys also this trend is observable. But

Girls showed a general trend of high Achievement with Highly Preferred Learning Style and Highly Desirable Approaches to Studying when associated with Less Favourable Classroom Climate. Rural sample showed that higher level of Achievement is possible with Highly Desirable Approaches to Studying and Highly Favourable Classroom Climate irrespective of Learning Style. But in Urban sample Less Preferred Learning Style and Less Favourable Classroom Climate could be identified as the most contributing levels for high Achievement with HDAS. In Government sample also higher level of Achievement is attained by the combination of Less Preferred Learning Style, Highly Desirable Approaches to Studying and Less Favourable Classroom Climate. But in Private Sample high level of Achievement is visible when Highly Preferred Learning Style and Highly Desirable Approaches to Studying supported by Less Favourable Classroom Climate.

However the general trend reveals that higher level of achievement is associated with *Highly Preferred Learning Style, Highly Desirable Approaches to Studying* and *Highly Favourable Classroom Climate*.

Deviation from parallelism and cross over of lines are the two prominent features evident in all the graphs. Absence of constant difference in outcomes between different levels accounts for the lack of parallelism.

4.4. MULTIPLE REGRESSION ANALYSIS - STEP WISE

This statistical technique has been employed to find out the set of predictor variables (Independent) that best predicts the criterion variable (Dependent).

4.4.1. PREDICTION OF ACHIEVEMENT IN SOCIAL SCIENCES USING INDEPENDENT VARIABLES

The investigator has made an attempt here to predict Achievement in Social Sciences (Criterion Variable) using the set of three Independent Variables (Predictor Variables) viz., *Learning Style*, *Approaches to Studying* and *Classroom Climate* in the descending order of the influence.

In this section, stepwise regression analysis by ANOVA approach has been done not only to select the set of variables that best predicts the criterion variable, but also to eliminate superfluous predictor variables. The analysis has been done using SPSS Program and the details of relevant results at each step are presented.

The data of intercorrelation of criterion variable (Achievement in Social Sciences) with three predictor variables are given in Table 4.25.

TABLE 4.25

Correlation Matrix for Achievement in Social Sciences

Variables	Y Achievement in Social Sciences	X₁ Learning Style	X₂ Approaches to Studying	X₃ Classroom Climate
Y - Achievement in Social Sciences	1.00	0.130*	0.20*	0.056
X₁ - Learning Style		1.00	0.144	0.122
X₂ - Approaches to Studying			1.00	0.268
X₃ - Classroom Climate				1.00

* $P < 0.05$

It can be observed from Table 4.25 that variable X₂ (Approaches to Studying) obtained the highest correlation coefficient ($r = 0.2$) with the criterion variable. Hence it is selected to enter first in the analysis.

The results of step wise regression analysis for Achievement in Social Sciences is summarised and presented in Table 4.26.

TABLE 4.26
Results of Multiple Regression Analysis - Stepwise for Achievement in Social Sciences

Step No.	Predictor Variable	R	R ²	S Er	F-value for R	B	Constant B ₀	β	r	R ² x100 shared variance	Increment in percentage variance	t-value	Significance of t
1.	Approaches to Studying	0.20	0.036	8.21	33.86	0.217	17.47	0.174	0.20	3.60	--	5.322	0.01
2.	Learning Style	0.216	0.0465	8.168	22.29 (2,914)	0.141	10.99	0.105	0.130	4.65	1.05	3.222	0.01

R - Multiple Correlation

r - Zero order correlation

β - Standardised Partial Regression Coefficient

B - Partial Regression Coefficient

Step I

Table 4.26 reveals that the multiple correlation (R) is 0.20 and this value is significant beyond 0.01 level, F -value being 33.86 for $df = 2, 914$. This points out the existence of a linear relationship. The strength of association between Achievement in Social Sciences and Approaches to Studying can be verbally interpreted as low since the value obtained for coefficient of determination is only 18.9 percent.

Table 4.26 further shows that multiple R^2 is 0.036. This shows that 3.6 percent of variance in Achievement in Social Science of the sample is accounted by whatever is measured by the variable X_2 , i.e., Approaches to Studying. The remaining percentage of variance is attributed to variables not measured in this regression equation. This variable is positively related with Achievement in Social Sciences.

The partial regression coefficient (B) is 0.217. This value indicates that scores of Achievement in Social Sciences would change by 0.217 units for every unit change in the Independent Variable, Approaches to Studying.

Step II

After entering Approaches to Studying the next predictor variable entered in step II is Learning Style (X_1).

The result of analysis at Step II show that the value of multiple correlation (R) is 0.216 and the value is significant at 0.01 level ($F = 22.29$, $df = 2, 914$). The strength of association between Achievement in Social Science and Learning Style can be verbally interpreted as low since the value obtained for coefficient of determination is only 21.6 percent.

Table 4.26 shows that multiple R^2 is 0.0465 which indicates that the two Independent Variables Approaches to Studying and Learning Style put together could explain 4.6 percentage of variance of Achievement in Social Sciences. The remaining percentage of variance must be attributed to variables not measured in this equation. The percentage has been raised from 3.6 to 4.65 the increment being 1.05.

The relative contribution of the variables X_2 (Approaches to Studying) and X_1 (Learning Style) in terms of variance predicted by each variable was determined and given in table 4.26. It can be noted that of the 4.65 percent of variance 3.6 percent is accounted by the variable X_2 (Approaches to Studying) and the remaining 1.05 percent of variance is accounted by the variable X_1 (Learning Style).

As shown in the Table 4.26 the standardised partial regression coefficients (Beta weights) for the predictor variables are 0.174 (Approaches to Studying) and 0.105 (Learning Style). The best predictor variable holds the highest beta weights. In this case as Approaches to Studying has the highest beta weight it is the *best predictor* of Achievement in Social Sciences.

The partial regression coefficient (B) is 0.217 for Approaches to Studying and 0.141 for Learning Style. These values indicate that the scores of Achievement in Social Sciences would change by 0.217 units for every unit change in the variable Approaches to Studying and 0.141 unit for every unit change in the variable Learning Style.

The value of the constant that would go into the Multiple Regression equation that could be written to predict Achievement in Social Sciences at this stage is 10.99. The regression equation can be written as

$$Y' = B_0 + B_1X_1 + B_2X_2$$

i.e.,
$$Y' = 10.99 + 0.217 X_2 + 0.141 X_1$$

where Y' refers to the score of Achievement in Social Sciences, X_2 the score of Approaches to Studying and X_1 the score of Learning Style. This equation helps to find out the individual predictor value Y , given the value of X_2 and X_1 .

It can be observed that the predictive accuracy is reached at an end using *two* out of the three predictor variables.

As per Table 4.26 the t-values for the predictor variables Approaches to Studying and Learning Style are 5.322 and 3.222 respectively and found to be significant and hence these variables are fully suitable for multiple regression analysis.

Results of the analysis revealed that out of the three predictor variables *Approaches to Studying* has emerged to be the best predictor of Achievement and it was Learning Style that appeared to be the *next best predictor* of Achievement. The third variable Classroom Climate has relatively lesser role in predicting Achievement in Social Sciences.

Chapter 5

SUMMARY FINDINGS AND SUGGESTIONS

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- ❖ *Study in Retrospect*
 - ❖ *Procedure*
 - ❖ *Major Findings of the Study*
 - ❖ *Tenability of Hypotheses*
 - ❖ *Suggestions for Improving Educational Practice*
 - ❖ *Suggestions for Further Research*
-

CHAPTER 5

SUMMARY FINDINGS AND SUGGESTIONS

This chapter highlights the significant findings, their educational implications and suggestions for further research.

5.1. STUDY IN RETROSPECT

Various aspects in the different stages of the present investigation like the problem, variables, objectives, hypotheses, methodology used are reviewed retrospectively.

5.1.1. RESTATEMENT OF THE PROBLEM

As stated earlier the present study was intended to explain the *main* and *interaction* effects of Learning style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences of Secondary School Pupils. Thus the study is entitled as "*Interaction Effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences of Secondary School Pupils*".

5.1.2. VARIABLES SELECTED FOR THE STUDY

The following were the variables selected for the study.

5.1.2.1. Independent Variables

The Independent Variables selected for the study were

1. *Learning Style* (Four components viz., Environmental, Emotional, Sociological, Physical and Total score).
2. *Approaches to studying* (Four components viz., Meaning Orientation, Reproducing Orientation, Achieving Orientation, Non-Academic Orientation and Total score) and
3. *Classroom Climate* (Total score only).

5.1.2.2. Dependent Variables

The Dependent Variables selected for the study were *Achievement in Social Sciences* (Six Objective wise scores viz., Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation and Total Score).

5.1.3. OBJECTIVES

Following are the objectives formulated for the study.

- 5.1.3.1. To study *whether there exists* any sex difference in Learning Style (Componentwise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 5.1.3.2. To study *whether there exists* any sex difference in Approaches to Studying (Componentwise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.

- 5.1.3.3. To study *whether there exists* any sex difference in Classroom Climate (Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 5.1.3.4. To study *whether there exists* any sex difference in Achievement in Social Sciences (Objective wise and Total score) or not for the Total sample and Subsamples based on Locale and Type of management of school.
- 5.1.3.5. To study the *main* and *interaction* effects of the three Independent variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Total sample.
- 5.1.3.6. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Boys.
- 5.1.3.7. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Girls.
- 5.1.3.8. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Rural sample.

- 5.1.3.9. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Urban sample.
- 5.1.3.10. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Government sample.
- 5.1.3.11. To study the *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Private sample.
- 5.1.3.12. To find out the *best predictor* of Achievement in Social Sciences from the set of three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate.

5.1.4. HYPOTHESES

The following hypotheses were framed and tested for the present study.

- 5.1.4.1. There will be *significant* sex difference in Learning Style (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.

- 5.1.4.2. There will be *significant* sex difference in Approaches to Studying (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 5.1.4.3. There will be *significant* sex difference in Classroom Climate (Total score) for the Total sample and Subsamples based on Locale and Type of management of school.
- 5.1.4.4. There will be *significant* sex difference in Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for the Total sample and Subsamples based on Locale and Type of management of school.
- 5.1.4.5. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for the Total sample.
- 5.1.4.6. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Boys.
- 5.1.4.7. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Girls.

- 5.1.4.8. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Rural sample.
- 5.1.4.9. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Urban sample.
- 5.1.4.10. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Government sample.
- 5.1.4.11. The main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be *significant* for Private sample.
- 5.1.4.12. Achievement in Social Sciences can be *predicted* using the set of three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate.

5.2. PROCEDURE

The procedure adopted for the present study is described as follows.

5.2.1. SAMPLE FOR THE STUDY

The study was conducted on a representative sample of 917 pupils of standard IX of Secondary Schools from four districts of Kerala state. Due representation to Sex (Boy/Girl), Locale (Rural/Urban) and Type of Management of schools (Govt./Private) were given through proportionate stratified sampling technique.

5.2.2. TOOLS USED

The tools used for collecting the required data were the following.

1. *Learning Style Inventory* (LSI - Kumar, et. al., 1996.)
2. *Approaches to Studying Inventory* (ASI - Kumar & Das, 2001)
3. *Scale of Classroom Climate* (SCC - Usha & Sunitha, 1997)
4. *Achievement Test in Social Sciences* (ATSS - Kumar & Das, 2001)

5.2.3. STATISTICAL TECHNIQUES USED FOR THE ANALYSIS OF DATA

Following statistical techniques were utilized for the processing of data in the present study.

5.2.3.1. *Test of Significance of Difference Between Means*

To study the sex difference in Independent Variables and Dependent Variables this statistical procedure was used.

5.2.3.2. *ANOVA with 3 x 3 x 3 Factorial Design*

To understand whether variation in Dependent Variables be attributable to variation in the levels of Independent Variables Three-way ANOVA with 3 x 3 x 3 factorial design was employed.

5.2.3.3. *Scheffé Test of Post-hoc Comparison*

ANOVA is followed by post hoc comparison of criterion means through Scheffé procedure. This was done to examine which levels of the Independent Variables those have a significant main effect actually cause variation in the Dependent Variables.

5.2.3.4. *Multiple Regression Analysis – Step wise*

This statistical technique was used to predict the criterion (dependent) variable from the set of predictor (independent) variables.

5.3. MAJOR FINDINGS OF THE STUDY

The major findings of the study are briefly discussed in this section. These are the results of mean difference analysis, identification of learning style preference and study approaches, 49 ANOVA executed (seven for Total Sample and seven each for each of the six Sub-samples viz., Boys, Girls, Rural, Urban Government and Private) to examine the *main* effect and the *interaction* effects of the Independent Variables on Achievement in Social Sciences (Objective wise and Total score) and Multiple Regression Analysis – Stepwise intended to find out the predictor variable.

5.3.1. SEX DIFFERENCE IN INDEPENDENT VARIABLES

The results of test of significance of difference between means to study the sex difference on the three independent variables are presented as follows.

5.3.1.1. Sex Difference in Learning Style

In the Independent Variable, Learning Style significant sex difference could be observed in the components *Emotional Style area* (Government sample), *Social Style area* (Total and Urban samples) and *Physical Style area* (Total, Rural and Private samples). The t-values showing sex difference are presented as follows in the decreasing order of magnitude.

Variable	Sample	t-value	Level of significance
Physical	Rural	2.60	0.01
Physical	Private	2.60	0.01
Social	Total	2.57	0.01
Physical	Total	2.32	0.05
Social	Urban	2.28	0.05
Emotional	Government	2.06	0.05

It was further observed that *no significant sex difference* could be observed in all samples for Emotional Style area, in Total, Rural, Urban and Private samples for Social Style area, in Urban and Government samples for Physical Style area and in all samples for Learning Style (Total score).

5.3.1.2. Sex Difference in Approaches to Studying

In Approaches to Studying there was significant sex difference in the components *Meaning Orientation* in Private sample, *Non-Academic Orientation* in Total sample and *Approaches to Studying (Total)* in Rural

sample. The significant t values are presented as follows in the decreasing order of magnitude.

Variable	Sample	t-value	Level of significance
Meaning Orientation	Private	2.52	0.05
Non-Academic Orientation	Total	2.06	0.05
Approaches to Studying (Total)	Rural	1.99	0.05

No significant sex difference was found for Meaning Orientation in Total, Rural, Urban and Government samples, for Reproducing Orientation and Achieving Orientation in all samples and for Approaches to Studying (Total score) in Total, Urban, Government and Private samples.

5.3.1.3. Sex Difference in Classroom Climate

In the Independent Variable Classroom Climate significant sex difference was observed in all samples at *0.01 level*. The details of t -values obtained are presented as follows in the decreasing order of significance.

Independent Variable	Sample	t-value	Level of significance
Classroom Climate	Total	6.02	0.01
	Rural	5.37	0.01
	Private	5.14	0.01
	Government	3.13	0.01
	Urban	2.92	0.01

5.3.2. SEX DIFFERENCE IN DEPENDENT VARIABLES

In the Dependent Variable, Achievement in Social Sciences (Objectivewise and Total score) *significant sex difference* could be found in Total, Rural and Government samples for the objectives Knowledge, Comprehension, Application, Synthesis and Total score. In Urban sample there was significant sex difference for the objectives Comprehension, Synthesis and Total score and in Private sample for Synthesis and Total score. The significant t-values obtained are listed as follows in the decreasing order of magnitude.

Dependent Variable	Sample	t-value	Level of significance
Knowledge	Rural	5.99	0.01
Achievement in Social Sciences (Total)	Government	5.84	0.01
Synthesis	Total	5.32	0.01
Comprehension	Government	5.03	0.01
Achievement in Social Sciences (Total)	Total	4.92	0.01
Achievement in Social Sciences (Total)	Rural	4.81	0.01
Knowledge	Government	4.64	0.01
Synthesis	Rural	4.40	0.01
Comprehension	Total	4.11	0.01
Knowledge	Total	4.04	0.01
Synthesis	Government	4.00	0.01
Synthesis	Private	3.74	0.01
Application	Government	3.41	0.01
Comprehension	Urban	3.31	0.01
Comprehension	Rural	3.06	0.01
Synthesis	Urban	3.00	0.01
Achievement in Social Sciences (Total)	Urban	2.35	0.05
Application	Total	2.23	0.05
Application	Rural	2.00	0.05
Achievement in Social Sciences (Total)	Private	1.94	0.05

No significant sex difference could be observed for the objectives Analysis and Evaluation in Total, Rural and Government samples. In Urban sample for the objectives Knowledge, Application, Analysis and Evaluation and in Private sample for the objectives Knowledge, Comprehension, Application, Analysis and Evaluation also *no significant sex difference* was noticed.

5.3.3. IDENTIFICATION OF LEARNING STYLE PREFERENCES

Learning style preferences of pupils (Total and all Subsamples) were identified with the help of mean and standard deviation. It revealed that the most preferred Learning Style component was *Physical style*, which was followed by Emotional Style and Environmental Style. The least preference was associated with the Sociological style.

5.3.4. IDENTIFICATION OF STUDY APPROACHES

While identifying study approaches of pupils (Total and all Subsamples) it was revealed that the highly preferred study approach was *Achieving Orientation*. The next study approaches preferred were Reproducing Orientation and Non-Academic Orientation respectively. The least preferred study approach was Meaning Orientation.

5.3.5. MAIN EFFECTS OF INDEPENDENT VARIABLES

The main effects of three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) are discussed here.

5.3.5.1. Main Effect of Learning Style

The Independent Variable Learning Style yielded significant main effect on Achievement in Social Sciences (Objective wise and Total score) in *Nine* ANOVA for the Sub-samples *Girls* (Comprehension and Total Score), *Rural* (Comprehension, Synthesis and Total score), *Government* (Total score) and *Private* (Comprehension, Application and Total score). Details of the significant F-values are presented as follows in the decreasing order of magnitude.

Sl. No.	Sample	N	Dependent Variable	F-Values
1.	Private	603	Achievement in Social Sciences (Total score)	9.13**
2.	Private	603	Application	7.96**
3.	Private	603	Comprehension	7.69**
4.	Government	314	Achievement in Social Sciences (Total score)	4.139*
5.	Girls	475	Achievement in Social Sciences (Total score)	3.862*
6.	Rural	611	Comprehension	3.727*
7.	Rural	611	Achievement in Social Sciences (Total score)	3.705*
8.	Girls	475	Comprehension	3.497*
9.	Rural	611	Synthesis	3.345*

** $P < 0.01$

* $P < 0.05$

5.3.5.2. Main Effect of Approaches to Studying

Significant main effect of Approaches to Studying on Achievement in Social Sciences (Objective wise and Total score) was found in *eleven* ANOVA as *three* for Total Sample (Knowledge, Application and Total score) *two* for Girls (Knowledge and Application) *three* for Rural (Knowledge, Application and Total score), *one* for Urban (Knowledge) and *two* for Private (Knowledge and Application). The significant F-values are given in the decreasing order of importance as follows.

Sl. No.	Sample	N	Dependent Variable	F-values
1.	Rural	611	Knowledge	7.369**
2.	Total	917	Knowledge	7.155**
3.	Private	603	Knowledge	6.31**
4.	Total	917	Application	5.134**
5.	Rural	611	Achievement in Social Sciences (Total score)	4.387*
6.	Rural	611	Application	4.193*
7.	Urban	306	Knowledge	3.869*
8.	Private	603	Application	3.71*
9.	Total	917	Achievement in Social Sciences (Total score)	3.584*
10.	Girls	475	Application	3.518*
11.	Girls	475	Knowledge	3.214*

** $P < 0.01$

* $P < 0.05$

5.3.5.3. Main Effect of Classroom Climate

For the Independent Variable Classroom Climate significant main effect is found to exist in only *one* ANOVA for Boys in Comprehension. The significant F-value is presented as follows.

Sl.No.	Sample	N	Dependent Variable	F - value
1.	Boys	442	Comprehension	3.127*

*P < 0.05.

5.3.6. TWO-WAY INTERACTIONS

Two-way interaction of Learning Style x Classroom Climate reported *two* significant F- ratios for Government Sample in Total score and Knowledge; and Approaches to Studying x Classroom Climate in *one* for Total Sample in Analysis. The significant F-ratios of two-way interactions are presented as follows in the decreasing order of magnitude.

Sl. No.	Sample	N	Dependent Variable	F-value LSxCC	F-value AS xCC
1.	Government	314	Achievement in Social Sciences (Total score)	3.095*	-
2.	Total	917	Analysis	-	2.799*
3.	Government	314	Knowledge	2.509*	-

P < 0.05

LS - Learning Style

AS - Approaches to Studying

CC - Classroom Climate

5.3.7. THREE-WAY INTERACTION

Three-way interaction of Learning Style x Approaches to Studying x Classroom Climate yielded *one* significant F value in Government Sample for Synthesis and it is shown as follows.

Sl. No.	Sample	N	Dependent Variable	F - value LS x AS x CC
1.	Government	314	Synthesis	2.07**

* $P < 0.05$

LS - Learning Style

AS - Approaches to Studying

CC - Classroom Climate

5.3.8. GROUP DIFFERENCE IN MEAN ACHIEVEMENT IN SOCIAL SCIENCES

Scheffe' test of Post-hoc comparison was carried out wherever significant main effect of Learning Style, Approaches to Studying and Classroom Climate on Achievement in Social Sciences (Objective wise and Total score) found to exist. Results of Scheffe' test enabled the investigator to identify *group difference in mean achievement in Social Sciences* (Objective wise and Total score) for relevant groups based on the Independent Variables.

5.3.8.1. Group Difference in Mean Achievement in Social Sciences (Objective wise and Total score) Based on Learning Style

Scheffé test of Post-hoc comparison was carried out on *Nine* significant F-ratios in Learning Style obtained for the samples - Girls, Rural Government and Private out of forty nine ANOVA. F-values obtained in

Scheffé test are arranged in the decreasing order of magnitude in case of each sample and presented as follows:

Sample	N	Dependent Variable	Groups Compared	F-Value	Level of Significance
Girls	475	Comprehension	HPLS – LPLS	11.87	0.01
			HPLS – MPLS	9.03	0.05
			MPLS – LPLS	2.70	NS
Girls	475	Total Score	HPLS – LPLS	14.86	0.01
			HPLS – MPLS	7.37	0.05
			MPLS – LPLS	7.16	0.05
Rural	611	Comprehension	HPLS – LPLS	16.79	0.01
			HPLS – MPLS	9.34	0.01
			MPLS – LPLS	7.48	0.05
Rural	611	Synthesis	MPLS – LPLS	3.00	0.75
			HPLS – MPLS	2.37	NS
			HPLS – LPLS	0.01	NS
Rural	611	Total Score	MPLS – LPLS	13.99	0.01
			HPLS – LPLS	11.40	0.01
			HPLS – MPLS	2.50	NS
Govt.	314	Total Score	HPLS – MPLS	4.70	0.10
			MPLS – LPLS	3.13	NS
			HPLS – LPLS	0.14	NS
Private	603	Comprehension	HPLS – MPLS	17.67	0.01
			HPLS – LPLS	17.64	0.01
			MPLS – LPLS	1.70	NS
Private	603	Application	HPLS – LPLS	22.72	0.01
			HPLS – MPLS	13.12	0.01
			MPLS – LPLS	6.41	0.05
Private	603	Total Score	HPLS – LPLS	57.68	0.01
			HPLS – MPLS	17.68	0.01
			MPLS – LPLS	6.61	0.05

HPLS – Highly Preferred Learning Style; MPLS – Moderately Preferred Learning Style; LPLS – Less Preferred Learning Style.

NS : Not Significant

Results of the Post-hoc comparison of three groups, formed on the basis of Learning Style, viz., HPLS, MPLS and LPLS revealed the following:

1. 20 groups out of 27 groups compared obtained significant difference in mean achievement.
2. Significant mean differences in Achievement could be noticed in all the pairs of the groups compared (HPLS-MPLS; HPLS-LPLS; MPLS-LPLS) for Total score in Girls, Comprehension in Rural and Application and Total Score in Private Samples.
3. The groups compared viz., MPLS-LPLS in the objective - Comprehension (Girls), HPLS-MPLS; HPLS-LPLS in Synthesis (Rural), HPLS-MPLS in Total Score (Rural), MPLS-LPLS; HPLS-LPLS in Total Score (Govt.) and MPLS-LPLS in Comprehension (Private) do not show any significant difference between their means.
4. Comparison of mean achievement scores in Social Sciences (Objective wise and Total score) showed the superiority of *HPLS* group over MPLS and LPLS groups and of *MPLS* group over LPLS group.

It can thus be concluded that the groups - HPLS, MPLS and LPLS are *dissimilar* in their performance and their achievement in Social Sciences *varies* with regard to the three groups based on Learning Style (HPLS-MPLS; HPLS-LPLS; MPLS-LPLS).

5.3.8.2. Group Difference in Mean Achievement in Social Sciences (Objective wise and Total score) Based on Approaches to Studying

In Approaches to Studying out of 49 ANOVA *eleven significant* main effects were reported for Total Sample and Sub samples of Girls, Rural and Private. The mean achievement scores in Social Sciences (Objective wise

and Total score) based on Approaches to Studying (HDAS, MDAS and LDAS) were compared using Scheffé test of post-hoc comparison. The F-values obtained in the Scheffé test are arranged in the decreasing order of magnitude in each sample is presented as follows.

Sample	N	Dependent Variable	Groups Compared	F Value	Level of Significance
Total	917	Knowledge	HDAS – LDAS	29.46	0.01
			MDAS – LDAS	12.02	0.01
			HDAS – MDAS	2.80	NS
Total	917	Application	HDAS – LDAS	13.42	0.01
			HDAS – MDAS	10.83	0.01
			MDAS – LDAS	1.83	NS
Total	917	Total Score	HDAS – MDAS	13.18	0.01
			MDAS – LDAS	9.47	0.01
			HDAS – LDAS	1.07	NS
Girls	475	Knowledge	HDAS – MDAS	13.18	0.01
			MDAS – LDAS	9.47	0.01
			HDAS – LDAS	1.07	NS
Girls	475	Application	HDAS – LDAS	7.29	0.05
			MDAS – LDAS	4.08	NS
			HDAS – MDAS	2.05	NS
Rural	611	Knowledge	HDAS – LDAS	24.95	0.01
			MDAS – LDAS	10.31	0.01
			HDAS – MDAS	9.69	0.01
Rural	611	Application	HDAS – LDAS	9.66	0.01
			HDAS – MDAS	7.76	0.05
			MDAS – LDAS	1.33	NS

Sample	N	Dependent Variables	Groups Compared	F Value	Level of Significance
Rural	611	Total Score	HDAS – LDAS	24.66	0.01
			MDAS – LDAS	10.00	0.01
			HDAS – MDAS	9.72	0.01
Urban	306	Knowledge	HDAS – LDAS	6.96	0.05
			MDAS – LDAS	6.93	NS
			HDAS – MDAS	1.90	NS
Private	603	Knowledge	HDAS – LDAS	28.86	0.01
			MDAS – LDAS	12.28	0.01
			HDAS – MDAS	1.49	NS
Private	603	Application	HDAS – LDAS	83.46	0.01
			HDAS – MDAS	10.51	0.01
			MDAS – LDAS	0.035	NS

HDAS – Highly Desirable Approaches to Studying; MDAS – Moderately Desirable Approaches to Studying; LDAS – Less Desirable Approaches to Studying.

NS : Not Significant.

Results of Post-hoc comparison of three groups, formed on the basis of Approaches to Studying (HDAS, MDAS & LDAS) showed the following.

1. The mean achievement scores in 21 out of the 33 groups compared were significantly different.
2. Significant difference in mean achievement could be noticed in all the three groups compared (HDAS – MDAS; HDAS – LDAS; MDAS – LDAS) for the objective – Knowledge and Total Score in Rural Sample.

3. The groups compared viz., HDAS-MDAS in the objective - Knowledge (Total Sample), MDAS - LDAS in the objective - Application (Total sample), HDAS-LDAS in Total Score (Total sample), MDAS-LDAS and HDAS-MDAS in Knowledge (Girls), MDAS-LDAS and HDAS-MDAS in Application (Girls), MDAS-LDAS in Application (Rural), MDAS-LDAS and HDAS-MDAS in Knowledge (Urban), HDAS-MDAS in Knowledge (Private) and MDAS-LDAS in Application (Private) do not show any significant difference between their means.
4. Comparison of mean achievement scores in Social Sciences (Objective wise and Total score) revealed the superiority of HDAS group over MDAS and LDAS groups and MDAS group over LDAS group.

Hence it can be inferred that the groups HDAS, MDAS and LDAS are dissimilar in their performance and Achievement in Social Sciences varies on account of the three groups based on Approaches to Studying.

5.3.8.3. Group Difference in Mean Achievement in Social Sciences (Objective wise and Total score) based on Classroom Climate

In Classroom Climate only *one* significant F-ratio was found in the objective - Comprehension for Boys. The mean achievement scores based on Classroom Climate (HFCC, MFCC and LFCC) were compared using Scheffé test of Post-hoc comparison. The results of post-hoc comparison are given as follows in the decreasing order of magnitude.

Sample	N	Dependent Variable	Groups compared	F Values	Level of significance
BOYS	442	Comprehension	HFCC-MFCC	9.09	0.05
			HFCC-LFCC	5.32	NS
			MFCC-LFCC	0.69	NS

HFCC - Highly Favourable Classroom Climate; MFCC - Moderately Favourable Classroom Climate; LFCC - Less Favourable Classroom Climate.

NS - Not significant.

Results of this post-hoc comparison shows that the group HFCC-MFCC differ significantly in mean achievement. But the comparison of the groups HFCC-LFCC and MFCC-LFCC did not show any significant difference between their mean achievement scores. The results further show that the mean achievement scores are higher for HFCC, followed by LFCC and MFCC.

The results revealed that the groups HFCC, MFCC and LFCC are dissimilar in their performance and its mean achievement score is found to vary with the levels compared.

5.3.9. MULTIPLE REGRESSION ANALYSIS - STEP WISE

Multiple Regression Analysis - Stepwise revealed that from the set of three Independent Variables, viz., Learning Style, Approaches to Studying and Classroom Climate, the best predictor variable of Achievement in Social Sciences was found to be *Approaches to Studying* and the second predictor variable was *Learning Style* with high percentage variance and *t* values. The shared variance, increment in percentage variance and *t* values obtained in two steps are presented as follows:

Step No.	Predictor Variable	Shared variance	Increment in percentage variance	t-value	Significance of t
1.	Approaches to Studying	3.60	--	5.322	0.01
2.	Learning Style	4.65	1.05	3.222	0.01

5.4. TENABILITY OF HYPOTHESES

On the light of the major findings the tenability of hypotheses set for the present study is examined as follows.

5.4.1. The first hypothesis was that *there will be significant sex difference in Learning Style (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.*

Out of 25 t-values studied to understand sex difference in Learning Style for Total Sample and Subsamples based on Locale and Type of management of school in *six* comparisons significant sex difference was noted. So this hypothesis is partially substantiated.

5.4.2. The second hypothesis was that *there will be significant sex difference in Approaches to Studying (Componentwise and Total score) for the Total sample and Subsamples based on Locale and Type of management of school.*

In Approaches to Studying out of 25 t-values studied to understand sex difference for Total Sample and Subsamples based on Locale and Type

of management of School *four* were found significant. So this hypothesis is also partially substantiated.

5.4.3. The third hypothesis was that *there will be significant sex difference in Classroom Climate (Total score) for the Total sample and Subsamples based on Locale and Type of management of school.*

All the *five t* values studied to test sex difference in Classroom Climate for Total Sample and Subsamples based on Locale and Type of management of school were found significant. So this hypothesis is accepted.

5.4.4. The fourth hypothesis was that *there will be significant sex difference in Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for the Total sample and Subsamples based on Locale and Type of management of school.*

In Achievement in Social Sciences (Objectivewise and Total score) significant sex difference was found in 20 out of 35 comparisons (*three* for the objective Knowledge, *four* for Comprehension, *three* for Application, *five* for Synthesis and *five* for Total score). This result clearly shows that there exist significant sex difference in Achievement in Social Sciences (Objectivewise and Total score) for Total sample and Subsamples. Hence this hypothesis is also accepted.

5.4.5. The fifth hypothesis was *the main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total Score) of Secondary School Pupils will be significant for the Total Sample*

The *main* and *interaction* effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) for Total Sample were found significant in Four ANOVA out of seven employed. This includes *three main effects* and *one interaction effect*. The main effects were in Approaches to Studying (3/7 ANOVA) for the objectives - Knowledge and Application and for Total score. The significant two-way interaction effect was obtained in Approaches to Studying x Classroom Climate (1/7 ANOVA) in the objective - Analysis. Altogether in total sample *four* F-values were found significant out of seven ANOVA. Hence the hypothesis is partially substantiated.

5.4.6. Hypothesis six stated that *the main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be significant for Boys*

The main and interaction effects of Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils for Boys is found significant only in *one* ANOVA out of seven. The significant main effect was for Classroom Climate (1/7 ANOVA) for Comprehension. Out of seven ANOVA only one F-value was found significant for Boys. So this hypothesis is rejected.

5.4.7. The seventh hypothesis was *the main and interaction effects of three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be significant for Girls.*

The results of Three-way ANOVA revealed that the main and interaction effects of Independent Variables on Achievement in Social Sciences (Objective wise and Total score) for Girls show *four* significant main effects. Learning Style reported *two* significant main effects out of *seven* ANOVA (Comprehension and Total score) and Approaches to Studying also yielded *two* significant main effects out of *seven* ANOVA (Knowledge and Application). As *four* significant main effect F-ratios were found for Girls out of *seven* ANOVA this hypothesis is also substantiated partially.

5.4.8 Hypothesis eight was *the main and interaction effects of three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be significant for Rural sample*

In Rural sample *Six* significant F-values were obtained by the main effects of Independent Variables on Achievement in Social Sciences (Objective wise and Total score). Among these *three* significant main effects were noted for Learning Style out of seven ANOVA (Comprehension, Synthesis and Total score). Approaches to Studying also has *three* significant main effects (Knowledge, Application and Total score) out of seven ANOVA. Altogether *Six* F- ratios were found significant out of Seven ANOVA for Rural Sample and hence this hypothesis is accepted to a greater extent.

5.4.9. The ninth hypothesis stated that *the main and interaction effects of the three Independent Variables on Achievement in Social Sciences*

(Objective wise and Total score) of Secondary School Pupils will be significant for Urban Sample.

The main and interaction effects of Independent Variables on Dependent Variables for Urban Sample were found significant in only *one* ANOVA (Approaches to Studying for Knowledge). Since only one F-value was found significant out of seven ANOVA this hypothesis is rejected.

5.4.10. The tenth hypothesis was *the main and interaction effects of the three Independent Variables on Dependent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be significant for Government Sample.*

For Government Sample it is noted that *one* significant main effect of Learning Style for Total Achievement, *two significant two way interactions* of Learning Style x Classroom Climate for Knowledge and Total Achievement and *one significant three-way interaction* of Learning Style x Approaches to Studying x Classroom Climate for Synthesis. Altogether *Four* F-values were found significant out of seven ANOVA for Urban Sample and hence the sixth hypothesis is accepted to a certain extent.

5.4.11. The eleventh hypothesis stated that *the main and interaction effects of the three Independent Variables on Achievement in Social Sciences (Objective wise and Total score) of Secondary School Pupils will be significant for Private Sample*

In Private Sample *Five* significant F-ratios could be observed for the main effects of Independent Variables on Achievement in Social Sciences

(Objective wise and Total score). Among this *three* significant main effect of Learning Style were noted (Comprehension, Application and Total Achievement) and *two* significant main effects of Approaches to Studying for Knowledge and Application. Out of seven ANOVA, *Five* F-ratios were found significant and hence the hypothesis is accepted to a greater extent.

5.4.12. The twelfth hypothesis was that *Achievement in Social Sciences can be predicted using the set of three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate.*

Out of the three Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate used for predicting Achievement in Social Sciences, *Approaches to Studying* was found to be the best predictor of achievement. The *second predictor variable* found was Learning Style. Hence this hypothesis is accepted.

5.5. SUGGESTIONS FOR IMPROVING EDUCATIONAL PRACTICE

Based on the results of the present investigation, the following suggestions were framed with a view to improve the practice of teaching and learning in the secondary school classrooms.

The findings revealed that changes in Independent Variables viz., Learning Style, Approaches to Studying and Classroom Climate independently and in combination mildly influenced Achievement in Social Sciences of Secondary School Pupils. This may be due to several intervening variables, that can hardly be controlled. Learning to a great extent depends upon a large number of facilitating and debilitating factors such as the *pupils aptitude and effect, socio familial background,*

instructional methods, cognitive style, classroom climate and pupils' style of learning and approaches to studying. Many investigators reported positive and negative relationships between these variables and academic achievement.

In the present study, the Independent Variable, Learning Style is based on the theory that an individual responds to educational experiences with consistent behaviour and performance patterns (Irvin & York, 1995). The complexity of the construct, the psychometric problems related to its measurement and the relationship between culture and teaching and learning process means that the body of research on Learning style may be interpreted and applied carefully.

Though the single effect of Learning Style on Achievement in Social Sciences is weak the study revealed that the two way interaction of *Learning Style with Classroom Climate* could boost up Achievement. It indicates the need to facilitate Learning Style and Classroom Climate in combination for improving Achievement. This finding warrants educators to evolve teaching and learning strategies combining climatic perceptions and Learning Styles of pupils.

It shows the necessity to reconstruct learning environment around students' Learning Styles as they are education relevant expressions of the uniqueness of the individual. So in order to carry out learning tasks successfully, it is important to provide multiple learning opportunities for students to suit their learning styles. The teachers need to achieve a *balance* between teaching strategies and the student's learning style.

However the two way interaction of Approaches to Studying x Classroom Climate revealed high level of Achievement. This finding is significant as Approaches to Studying and Classroom Climate form an *effective combination* for academic success. Thus the teaching and learning strategies need to be restructured involving learning approaches and classroom perceptions of students.

Hence it implies that the variety of factors that influence Approaches to Studying like intention, content and context, perception of the task and its setting, motives and academic self concept should be properly modified to facilitate a Highly Desirable Approaches to Studying that inturn improve the academic outcome. There is considerable evidence that the context the teacher sets up directly affects student's approach to learning.

Though experts and educationists have suggested for the adoption of the component, Meaning Orientation it is appeared that least significance is given to it by pupils. It necessitates a straight and steady shift in learning approach of students. First of all the goals of education should be diversified considering the future requirements rather than the present to encourage pupils to adopt Meaning Orientation. Learning needs to be viewed as an elegant, enlightened and life long process for the perfection of one's personal and social development. The investigative and scientific temperament of pupils may be utilised for this. Further the classrooms should be equipped with the modern facilities in tune with the technological advancement of the world and thus education should be made more vivid, enriched and experience based.

In the present investigation variation in the Independent Variable, Classroom Climate did not make significant differences in Achievement in Social Sciences of Secondary School Pupils. This finding goes in tune with the findings of Prasad (1988), Pandya (1991), Jack and Lizi (1993), Kumar (1995), Panikker (1996), Suresan (1997), Dunn and Harris (1988) and Lee, *et al.*, (1999). Though Classroom Climate did not reveal independent influence on academic achievement, significant interaction effect with Approaches to Studying and Learning Style on Achievement in Social Sciences could be noticed. This finding is significant as Classroom Climate in combination with Learning Style or Approaches to Studying can influence Achievement. It implies that in educational practice the involvement of climatic factors in combination with Learning Style and Approaches to Studying can yield wonderful results in Achievement.

Hence it indicates that the psychological and interpersonal atmosphere inside the classroom should be *conducive* and *congenial*. Both the physical facilities and academic activities that are rationally expected by a student are to be adapted to the needs and requirements to improve the learning outcome. Development of a child depends upon the continuous interaction between organism and environment (Piaget, 1973). This notion highlights the importance of Classroom Climate in learning process. Having a constructive classroom environment is an intrinsically valuable goal of schooling.

Even though the three Independent Variables, viz., Learning Style, Approaches to Studying and Classroom Climate independently influence Achievement in a lesser degree, when in combination *significant influence*

on Achievement is noticed. This finding appears to be remarkable as the interaction effect of these three Independent Variables can make positive influence on academic achievement. Hence this finding needs to be considered while framing educational programmes for future.

The graphical representation of interactions revealed that generally the higher groups (*Highly Preferred Learning Style, Highly Desirable Approaches to Studying* and *Highly Favourable Classroom Climate*) obtained high achievement scores. So deliberate efforts are required from the part of educators to activate and encourage pupils to adopt the pattern and characters of the higher groups.

Hence, cautious attempts may be made in schools to identify pupils' style preference and study approaches which are beneficial for their effective learning. This identification should be strictly in a psychometrical line using acceptable measuring instruments. The preferred learning style and distinct approaches to study thus identified may be utilized for teachers to design and select their teaching strategies. This can be done in all subject areas. Thereby effective and meaningful learning is possible in the classrooms because teaching is in accordance with the pupils' learning style and study approaches. Learning will be then tension free and a joyful event for the learners. But, teachers may be trained to teach in tune with the stylistic preference and approaches of the pupils to study.

Results of the present investigation further revealed that out of the three Independent Variables studied Approaches to Studying is the best predictor of Achievement in Social Sciences followed by Learning Style. This finding once again underlying the need to focus on Approaches to

Studying and Learning Style for improving student performance in classroom. Students may be inspired to accommodate and assimilate factors that strengthen these variables for better results than ever.

5.6. SUGGESTIONS FOR FURTHER RESEARCH

The findings of the present investigation are limited to its scope and limitations. The results can be made more elaborate if number of researches on the line of the present study are conducted. So the investigator suggests the following areas for further research.

1. Extension of the study to Higher Secondary School students, for whom the learning styles and study approaches are more definite and consistent.
2. Central schools and unaided schools, where CBSE syllabus is followed also may be covered for further investigation using these variables (Learning Style, Approaches to Studying and Classroom Climate).
3. Studies using these variables may be extended on subjects of Physical Sciences and Natural Sciences and results can be used for generalization.
4. Interaction of Learning Style and Approaches to Studying with other personality variables of students and teachers may be focussed.
5. Incorporation of the Cognitive Variables viz., Intelligence and Cognitive Style into the present study.
6. Factor analytic study of Learning Style and Approaches to Studying.

7. Impact of classroom factors on different academic subjects of Primary and Higher Secondary School pupils.
8. Interaction of environmental factors and other personality variables of learner with Learning Style and Approaches to Studying.
9. Influence of creativity and aspiration levels along with Learning Style and Approaches to Studying on scholastic achievement.
10. Effect of environmental factors, Achievement Motivation, and Cognitive Variables on Achievement in Social Sciences.
11. Style identification and match mismatch of pupils' learning style with teaching style in different curricular areas.
12. Whether or not Learning Style and Approaches to Studying are effectively discriminating High-achievers and Low-achievers in different subject area.
13. Large scale identification of Learning Styles and Study Approaches of Secondary and Higher Secondary Students.
14. Relationship of Personality types (Type A, Type B) and Learning Style of High School, Higher Secondary and College students may be attempted.
15. Relationship of Meaning, Achieving, Reproducing and Non-Academic Orientations with Achievement of School and College students.

16. A comprehensive study using Multiple Regression Analysis to find out the best predictor variable in different academic subjects taking the Components and Total scores of Learning Style, Approaches to Studying and Classroom Climate.
17. A path analytic study using the Components of Learning Style, Approaches to Studying and Classroom Climate on Achievement in different subject areas.

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A P P E N D I C E S

Appendix I

UNIVERSITY OF CALICUT DEPARTMENT OF EDUCATION LEARNING STYLE INVENTORY

Dr. P.K. Sudheesh kumar
Precetha. S., Rehna E.T., & sathy. P.

നിർദ്ദേശങ്ങൾ: താഴെ കൊടുത്തിരിക്കുന്ന ഓരോ പ്രസ്താവനയും ശ്രദ്ധാപൂർവ്വം വായിക്കുക. ഓരോ പ്രസ്താവനക്കും 3 വീതം പ്രതികരണങ്ങൾ കൊടുത്തിരിക്കുന്നു. 1. എല്ലായ്പ്പോഴും 2. ചിലപ്പോൾ മാത്രം 3. ഒരിക്കലുമില്ല. എന്നിങ്ങനെ ഓരോ പ്രസ്താവനയിലും പറയുന്ന കാര്യം നിങ്ങളെ സംബന്ധിച്ചിടത്തോളം യഥാർത്ഥത്തിൽ എത്രമാത്രം ശരിയാണെന്ന് തീരുമാനിക്കുക. ആ പ്രതികരണമാണ് രേഖപ്പെടുത്തേണ്ടത്. ഉത്തരക്കടലാസ് പ്രത്യേകം തന്നിട്ടുണ്ട്. തന്നിരിക്കുന്ന ഉത്തരക്കടലാസിൽ അതത് പ്രസ്താവനകളും നമ്പറിനെതിരെ നിങ്ങളുടെ ശരിയായ പ്രതികരണത്തിന് ചുവടെയുള്ള വൃത്തത്തിൽ 'X' ചിഹ്നം രേഖപ്പെടുത്തുക. പ്രസ്താവനകളുടെ ക്രമനമ്പർ നോക്കി ഉത്തരക്കടലാസിലെ അതേ നമ്പറിന് നേരെയുള്ള വൃത്തത്തിൽ വേണം 'X' ചിഹ്നം രേഖപ്പെടുത്താൻ. എല്ലാ പ്രസ്താവനകൾക്കും പ്രതികരണം രേഖപ്പെടുത്താൻ പ്രത്യേകം ശ്രദ്ധിക്കുമല്ലോ.

1. നിശബ്ദമായ ഒരു സ്ഥലത്തിരുന്ന് പഠിക്കുമ്പോൾ എനിക്ക് ഉറക്കം വരാറുണ്ട്.
2. നിശബ്ദമായ അന്തരീക്ഷത്തിൽ വളരെ പെട്ടെന്ന് പഠിക്കാൻ എനിക്ക് കഴിയുന്നുണ്ട്.
3. മങ്ങിയ പ്രകാശത്തിൽ പഠിക്കുമ്പോൾ ദീർഘനേരം പഠിക്കാൻ എനിക്ക് കഴിയാറില്ല.
4. ഫലപ്രദമായി പഠിക്കുവാൻ കസേരയിലിരുന്ന് പഠിക്കുന്നതിലാണ് എനിക്ക് താല്പര്യം.
5. പകൽ സമയത്ത് പഠിക്കുമ്പോൾ പഠനമുറിയുടെ കതകും ജനൽവാതിലുകളും ഞാൻ തുറന്നിടാറില്ല.
6. ചാരുകസേരയിൽ കിടന്ന് എനിക്ക് പഠിക്കാൻ കഴിയാറുണ്ട്.
7. നല്ല തണുപ്പുള്ള സമയങ്ങളിൽ പഠിക്കാൻ എനിക്ക് മടി അനുഭവപ്പെടാറുണ്ട്.
8. വേനൽകാലത്തെ ചൂടനേക്കാൾ മഴക്കാലത്തെ തണുപ്പാണ് പഠിക്കാനുള്ള നല്ല കാലാവസ്ഥയായി എനിക്ക് അനുഭവപ്പെടുന്നത്.
9. ശ്രദ്ധിച്ച് പഠിക്കുമ്പോൾ മറ്റൊരു ശബ്ദവും എനിക്ക് ശല്യമാകാറില്ല.
10. പകൽ സമയത്ത് അടഞ്ഞ മുറിക്കുള്ളിൽ ഇരുന്ന് പഠിക്കുന്നതിനേക്കാൾ തുറസ്സായ സ്ഥലത്തിരുന്ന് പഠിക്കാനാണ് എനിക്കിഷ്ടം.

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11. വെയിലിന് ചൂടു കൂടുമ്പോൾ പകൽ സമയത്തുള്ള എന്റെ പഠനം ഫലപ്രദമാകാറില്ല.
12. അന്നന്നു പഠിച്ചു തീർക്കാനുള്ള പാഠ്യ ഭാഗങ്ങൾ മുഴുവൻ പഠിച്ചു തീർക്കാതെ ഞാൻ എഴുന്നേൽക്കാറില്ല.
13. മറ്റുള്ളവർ നിർബന്ധിക്കുന്നതുകൊണ്ടാണ് ഞാൻ പഠിക്കുന്നത്.
14. ഒറ്റയിരുപ്പിന് പാഠങ്ങൾ പഠിച്ചു തീർക്കാൻ എനിക്ക് ബുദ്ധിമുട്ടാണ്.
15. അദ്ധ്യാപകർ ഏൽപ്പിക്കുന്ന പഠനകാര്യങ്ങൾ ഉദ്ദേശിച്ച നിലവാരത്തിൽ ചെയ്തു തീർക്കാൻ എനിക്ക് കഴിയാറുണ്ട്.
16. കഴിഞ്ഞ പരീക്ഷകളിൽ കിട്ടിയ മാർക്കിനേക്കാൾ കൂടുതൽ മാർക്ക് ലഭിക്കുവാനായി ഞാൻ നന്നായി പഠിക്കാറുണ്ട്.
17. പഠന സമയത്ത് ബുദ്ധിമുട്ടായി തോന്നുന്ന പാഠഭാഗങ്ങൾ ഞാൻ ഒഴിവാക്കാറുണ്ട്.
18. പഠനകാര്യങ്ങളിൽ അദ്ധ്യാപകരുടെ നിർദ്ദേശങ്ങൾ അക്ഷരംപ്രതി പാലിമണമെന്ന് എനിക്ക് നിർബന്ധമുണ്ട്.
19. ക്ലാസ്സിൽ ഓരോ ദിവസവും പഠിപ്പിക്കുന്ന കാര്യങ്ങൾ അന്നുതന്നെ പഠിക്കണമെന്ന് അദ്ധ്യാപകർ പറയുമെങ്കിലും ഞാൻ അത് ചെയ്യാറില്ല.
20. നന്നായി പഠിക്കണമെന്ന മാതാപിതാക്കളുടെ ആഗ്രഹത്തിനൊത്ത് എനിക്ക് ഉയരാൻ കഴിയാറുണ്ട്.
21. പുതിയ പാഠ്യഭാഗങ്ങൾ പഠിക്കാനായി അദ്ധ്യാപകർ നൽകുന്ന നിർദ്ദേശങ്ങൾ എനിക്ക് സ്വീകാര്യമല്ല.
22. പഠനത്തിനിടക്ക് വരുന്ന ഇടവേളകൾ ആദ്യം പഠിച്ച കാര്യങ്ങൾ മറക്കാൻ ഇടയാക്കുമെന്നാണ് എന്റെ അനുഭവം.
23. ഗഹനമായ ഒരു പാഠ്യപ്രശ്നത്തിന് പരിഹാരം കണ്ടെത്തേണ്ടിവരുമ്പോൾ എന്റെ കാഴ്ചപ്പാടാണ് എനിക്ക് പ്രധാനം.
24. നിത്യജീവിതത്തിലെ വസ്തുതകളും, സംഭവങ്ങളുമായി പാഠഭാഗങ്ങൾ ബന്ധിപ്പിച്ചാണ് ഞാൻ പഠിക്കാറുള്ളത്.
25. ചർച്ചകളിലൂടെയും പ്രവൃത്തികളിലൂടെയുമുള്ള പഠനരീതി എന്റെ പഠനസമയം നഷ്ടപ്പെടുത്താനേ ഉതകൂ.
26. പഠനകാര്യത്തിൽ മറ്റുള്ളവരുടെ പഠനശൈലി അനുകരിക്കുന്നതിനേക്കാൾ സ്വന്തം ശൈലി ഉപയോഗിക്കാൻ ഞാൻ ഇഷ്ടപ്പെടുന്നു.
27. സുഹൃത്തുമായിരുന്നു ചർച്ച ചെയ്ത് പഠിക്കുമ്പോൾ എളുപ്പത്തിൽ പഠിക്കാൻ എനിക്ക് കഴിയുന്നുണ്ട്.
28. പഠനത്തിൽ മിടുക്കരായ കുട്ടികളുടെ പഠനക്രമങ്ങൾ എന്നെ സ്വാധീനിക്കാറുണ്ട്.
29. സുഹൃത്തുക്കളുടെ പഠനരീതിയിൽ നിന്നും വ്യത്യസ്തമായ ഒരു ശൈലിയിൽ പഠിക്കാനാണ് എനിക്ക് താല്പര്യം.

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30. സുഹൃത്തുക്കളുമായി ഒരുമിച്ചിരുന്നു പഠിക്കുമ്പോൾ എന്റെ പഠനരീതിയിലുള്ള കുറവുകൾ ഞാൻ മനസ്സിലാക്കുന്നു.
31. റേഡിയോ, ടി.വി, എന്നിവയിലെ വിദ്യാഭ്യാസ പരിപാടികളിൽ എനിക്ക് ഉപയുക്തമായവ ഉണ്ടെന്ന് തോന്നിയിട്ടില്ല.
32. അതിരാവിലെയുള്ള പഠനം മറ്റു സമയങ്ങളിലുള്ള പഠനത്തേക്കാൾ എനിക്ക് ഫലപ്രദമായി അനുഭവപ്പെടാറുണ്ട്.
33. പാഠ്യവിഷയങ്ങളോട് ബന്ധപ്പെട്ട ചിത്രപ്രദർശനങ്ങൾ, പരീക്ഷണങ്ങൾ എന്നിവ നിരീക്ഷിച്ചാലും എന്റെ പഠനം എളുപ്പമാകാറില്ല.
34. ലഘുപരീക്ഷണങ്ങൾ സ്വയം ചെയ്തുന്നോക്കുന്നത് ശാസ്ത്ര തത്വങ്ങൾ മനസ്സിലാക്കാൻ എനിക്ക് സഹായകരമാകാറുണ്ട്.
35. പഠനത്തിനിടയിലുള്ള ചെറു ഇടവേളകൾ പഠിക്കാൻ ഉന്മേഷം നൽകാറുണ്ട്.
36. പഠനത്തിനിടയ്ക്ക് കുറച്ചുസമയം വിശ്രമിക്കുന്നത് എന്റെ പഠനത്തെ ഫലപ്രദമാക്കാറുണ്ട്.
37. പഠനത്തിനിടയിൽ ഭക്ഷണം കഴിക്കുന്നത് എന്റെ ശ്രദ്ധ തടസ്സപ്പെടുത്താറുണ്ട്.
38. രാവിലെയുള്ള പഠനം പാഠ്യഭാഗത്തെ വളരെവേഗം മനസ്സിലാക്കുന്നതിന് എന്നെ സഹായിക്കാറുണ്ട്.
39. വിശപ്പറിയാതെയുള്ള എന്റെ പഠനം ദീർഘനേരം നിലനിൽക്കാറുണ്ട്.
40. ശാസ്ത്രപാഠങ്ങളിൽ നിർദ്ദേശിച്ചിട്ടുള്ള പരീക്ഷണങ്ങൾ ഞാൻ ചെയ്തുന്നോക്കി പഠിക്കാറുണ്ട്.
41. പ്രഭാഷണങ്ങളും ചർച്ചകളും ശ്രദ്ധിച്ചു കേൾക്കുന്നത് എന്റെ പഠനം ഫലപ്രദമാക്കുന്നു.
42. അദ്ധ്യാപകൻ ക്ലാസിൽ കാണിച്ചു തന്ന പരീക്ഷണങ്ങൾ നിരീക്ഷിക്കുമെങ്കിലും അവ വിവരിച്ചു തന്നതാണ് എന്റെ പഠനത്തെ സഹായിക്കുന്നത്.
43. പുസ്തകത്തിൽ പാഠഭാഗങ്ങൾ വായിക്കുന്നതിനേക്കാൾ അദ്ധ്യാപകൻ ക്ലാസിൽ അവതരിപ്പിക്കുന്നത് കേട്ട് മനസ്സിലാക്കുന്നതാണ് എനിക്ക് കൂടുതൽ എളുപ്പം.
44. അദ്ധ്യാപകൻ പറഞ്ഞുതന്ന നോട്ടുകളെ ആധാരമാക്കി സ്വന്തമായി തയ്യാറാക്കുന്ന കുറിപ്പുകൾ പഠിക്കുന്നതാണ് എന്റെ പഠനരീതി.
45. മറ്റു പുസ്തകങ്ങൾ വായിച്ച് സ്വയം നോട്ടുകൾ തയ്യാറാക്കുന്നത് ആയാസകരമായി എനിക്ക് തോന്നാറുണ്ട്.

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Appendix - I A
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

LEARNING STYLE INVENTORY
RESPONSE SHEET

വിദ്യാർത്ഥിയുടെ പേര് വയസ്സ്

ക്ലാസ്

ക്ലാസ് നമ്പർ

ആൺകുട്ടി/പെൺകുട്ടി

No.	എല്ലായ്പ്പോഴും	ചിലപ്പോൾമാത്രം	ഒരിക്കലുമില്ല
1	☐	☐	☐
2	☐	☐	☐
3	☐	☐	☐
4	☐	☐	☐
5	☐	☐	☐
6	☐	☐	☐
7	☐	☐	☐
8	☐	☐	☐
9	☐	☐	☐
10	☐	☐	☐
11	☐	☐	☐
12	☐	☐	☐
13	☐	☐	☐
14	☐	☐	☐
15	☐	☐	☐

No.	എല്ലായ്പ്പോഴും	ചിലപ്പോൾമാത്രം	ഒരിക്കലുമില്ല
16	☐	☐	☐
17	☐	☐	☐
18	☐	☐	☐
19	☐	☐	☐
20	☐	☐	☐
21	☐	☐	☐
22	☐	☐	☐
23	☐	☐	☐
24	☐	☐	☐
25	☐	☐	☐
26	☐	☐	☐
27	☐	☐	☐
28	☐	☐	☐
29	☐	☐	☐
30	☐	☐	☐

No.	എല്ലായ്പ്പോഴും	ചിലപ്പോൾമാത്രം	ഒരിക്കലുമില്ല
31	☐	☐	☐
32	☐	☐	☐
33	☐	☐	☐
34	☐	☐	☐
35	☐	☐	☐
36	☐	☐	☐
37	☐	☐	☐
38	☐	☐	☐
39	☐	☐	☐
40	☐	☐	☐
41	☐	☐	☐
42	☐	☐	☐
43	☐	☐	☐
44	☐	☐	☐
45	☐	☐	☐

Appendix I B

UNIVERSITY OF CALICUT DEPARTMENT OF EDUCATION

LEARNING STYLE INVENTORY

Dr. P.K. Sudheesh Kumar,
Preetha, S., Rehna E.T. & Sathy, P.

Instructions: Read carefully each of the following statements. For each statement three types of responses are given: (1) Always (2) Sometimes (3) Never. Decide carefully your response and it has to be marked in a separate answer sheet provided, by putting 'X' in the relevant circle. Special care should be taken to mark response for every statement.

1. I feel sleepy while studying in a quiet place.
2. I can study quickly in a quiet atmosphere .
3. I cannot carry on with my studies for long, in dim vision.
4. For effective learning, I like to sit in a chair.
5. While studying during daytime, I do not keep the windows and doors of my study room open.
6. I can learn, while sitting in an easy chair.
7. I feel lazy in studying during cold seasons.
8. The chilly rainy atmosphere is preferable to the warm summer atmosphere for my studies.
9. I am not disturbed by any sound in utmost concentration.
10. I prefer studying in an open place, to studying in an enclosed room during day time.
11. My learning will not turn effective when the atmospheric temperature shoots up.
12. I study the daily portions that I am expected to cover for that day.

13. I learn on the compulsion of others.
14. I find it difficult to complete my studies at a stretch.
15. I can do the assigned works given by teachers in the expected standards.
16. I study well for achieving better marks than my previous ones.
17. I avoid difficult portions while studying.
18. I strictly abide by the instructions of my teachers in study matters.
19. Eventhough our teachers insist on our being up-to-date in studies, I seldom do so.
20. Often I succeed in rising upto the expectations of my parents regarding my studies.
21. I will not accept the instructions given by teachers for studying new portions.
22. The interval between the study periods is found to blur my memory of the things already studied.
23. When I have to find the solution for a serious academic problem, I go by my choice.
24. I learn by linking my lessons with things and incidents of daily life.
25. Learning through discussions and activities only robs my study time.
26. In studies I prefer my own style to that of others.
27. I can learn with ease, if I discuss matters with my friends.
28. The study methods of toppers influence me.
29. I like to study in a way which is different from that of my peers.
30. When I study in the company of my friends, I understand the defects in my study process.
31. Among the various educational programmes in radio and television, I could not find anyone to be of worth to me.
32. Studies in the early morning is found to be very effective for me than studies at other times of the day.
33. Observing the exhibitions and experiments related to the academic subjects will not facilitate my learning.
34. Conducting minor experiments by myself enables me to understand the scientific principles.

35. The short recesses during the study time boost up my enthusiasm to learn.
36. Taking rest for sometime during studies is found to be effective for my studies.
37. Eating while studying interrupts my concentration.
38. Studies in the morning is found to be effective for me.
39. I can study for long, if I am not haunted by hunger.
40. I learn by doing the experiments suggested in Science lessons.
41. Listening to talks and discussions make my studies effective.
42. Explanations given to the experiments help me to learn better than merely observing the experiments.
43. It is more easy for me to comprehend the lectures rather than reading the books.
44. My way of studying involves internalising the prepared short notes based on the notes given by the teacher.
45. It is difficult for me to prepare notes by reading other books.

Appendix I C

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

LEARNING STYLE INVENTORY
RESPONSE SHEET

Name of Student

Age

Class

Class No.

Boy / Girl

No	Always	Sometimes	Never
1	☐	☐	☐
2	☐	☐	☐
3	☐	☐	☐
4	☐	☐	☐
5	☐	☐	☐
6	☐	☐	☐
7	☐	☐	☐
8	☐	☐	☐
9	☐	☐	☐
10	☐	☐	☐
11	☐	☐	☐
12	☐	☐	☐
13	☐	☐	☐
14	☐	☐	☐
15	☐	☐	☐

No	Always	Sometimes	Never
16	☐	☐	☐
17	☐	☐	☐
18	☐	☐	☐
19	☐	☐	☐
20	☐	☐	☐
21	☐	☐	☐
22	☐	☐	☐
23	☐	☐	☐
24	☐	☐	☐
25	☐	☐	☐
26	☐	☐	☐
27	☐	☐	☐
28	☐	☐	☐
29	☐	☐	☐
30	☐	☐	☐

No	Always	Sometimes	Never
31	☐	☐	☐
32	☐	☐	☐
33	☐	☐	☐
34	☐	☐	☐
35	☐	☐	☐
36	☐	☐	☐
37	☐	☐	☐
38	☐	☐	☐
39	☐	☐	☐
40	☐	☐	☐
41	☐	☐	☐
42	☐	☐	☐
43	☐	☐	☐
44	☐	☐	☐
45	☐	☐	☐

Appendix II

UNIVERSITY OF CALICUT

DEPARTMENT OF EDUCATION

APPROACHES TO STUDYING INVENTORY

(Draft)

Dr. P.K. Sudheesh Kumar
&
K.K.Shanmugha Das

നിർദ്ദേശങ്ങൾ :

താഴെ കൊടുത്തിരിക്കുന്ന ഓരോ പ്രസ്താവനയും ശ്രദ്ധാപൂർവ്വം വായിക്കുക. ഓരോ പ്രസ്താവനയ്ക്കും 1. എല്ലായ്പ്പോഴും. 2. ചിലപ്പോൾ മാത്രം. 3. ഒരിക്കലുമില്ല എന്നിങ്ങനെ മൂന്ന് വീതം പ്രതികരണങ്ങൾ കൊടുത്തിരിക്കുന്നു. ഓരോ പ്രസ്താവനയും നിങ്ങളെ സംബന്ധിച്ചിടത്തോളം എത്രമാത്രം ശരിയാണെന്ന് തീരുമാനിക്കുക. ആ പ്രതികരണം പ്രത്യേകം തന്നിരിക്കുന്ന കടലാസിൽ ഓരോ പ്രസ്താവനയുടേയും നമ്പറിനുനേരെയുള്ള കോളത്തിൽ 'X' ചിഹ്നമിട്ട് രേഖപ്പെടുത്തുക. നിങ്ങൾ അടയാളപ്പെടുത്തിയ 'X' ചിഹ്നം തെറ്റായ സ്ഥാനത്താണെങ്കിൽ അതിനുചുറ്റും ഒരു വൃത്തം വരയ്ക്കുകയും (X) പുതിയ സ്ഥാനത്ത് 'X' ചിഹ്നം രേഖപ്പെടുത്തുകയും ചെയ്യുക. എല്ലാ പ്രസ്താവനകൾക്കും പ്രതികരണം രേഖപ്പെടുത്താൻ മറക്കരുത്.

മാതൃക:

ഞാൻ പതിവായി സ്വമേധയാ പഠനം നടത്തുന്നു.

എല്ലായ്പ്പോഴും	ചിലപ്പോൾ മാത്രം	ഒരിക്കലുമില്ല
	X	

1. പഠിക്കുമ്പോൾ എന്റെ മനസ്സിലുള്ള ചോദ്യങ്ങൾക്ക് ഉത്തരം കണ്ടെത്താനാണ് ഞാൻ ശ്രമിക്കുന്നത്.
2. പഠിക്കുന്ന കാര്യങ്ങൾ യഥാർത്ഥജീവിതത്തിൽ പ്രാവർത്തികമാണോ എന്നറിയാൻ എനിക്ക് താൽപര്യമില്ല.
3. പഠിക്കുന്ന വസ്തുതകളുടെ നിജസ്ഥിതി മനസ്സിലാക്കാൻ ഞാൻ സാധ്യമായ പരീക്ഷണങ്ങളും നിരീക്ഷണങ്ങളും നടത്താറുണ്ട്.
4. പഠിക്കുമ്പോൾ പാഠ്യവസ്തുവിന്റെ അടിസ്ഥാനം എന്താണെന്ന് മനസ്സിലാക്കാൻ ഞാൻ ശ്രമിക്കാറില്ല.
5. പഠിക്കുമ്പോൾ ഒരു വിഷയത്തിന് മറ്റു വിഷയങ്ങളുമായി എന്തെങ്കിലും ബന്ധമുണ്ടോ എന്ന് ഞാൻ പരിശോധിക്കാറില്ല.
6. ഒരു സിദ്ധാന്തമോ നിയമമോ പഠിക്കുമ്പോൾ അതിന് അത്തരത്തിലുള്ള മറ്റ് സിദ്ധാന്തങ്ങളും നിയമങ്ങളുമായുള്ള ബന്ധം കണ്ടെത്താൻ ഞാൻ ശ്രമിക്കാറുണ്ട്.
7. പഠിക്കുമ്പോൾ കണ്ടെത്തുന്ന വസ്തുതകളെ പരീക്ഷണ നിരീക്ഷണങ്ങളുടെ ഫലങ്ങളുമായി ഞാൻ താരതമ്യം ചെയ്തു നോക്കാറുണ്ട്.
8. നോട്ട് തയ്യാറാക്കുമ്പോൾ ഒരു പാഠ്യ വസ്തുവിന് മറ്റൊരു പാഠ്യവസ്തുവുമായി എന്തെങ്കിലും ബന്ധം കണ്ടെത്തിയാൽ അത് പ്രത്യേകം രേഖപ്പെടുത്താറില്ല.
9. ലഭ്യമായിരിക്കുന്ന തെളിവുകൾ ഉപയോഗിച്ച് തന്നിരിക്കുന്ന നിഗമനങ്ങൾ ശരിയാണോ എന്ന് ഞാൻ പരിശോധിക്കാറുണ്ട്.
10. നിഗമനങ്ങളുടെ സത്യാവസ്ഥ മനസ്സിലാക്കാൻ സാധ്യമായ പരീക്ഷണങ്ങൾ ചെയ്തു നോക്കാൻ ഞാൻ ശ്രമിക്കാറില്ല.

11. നിരീക്ഷണങ്ങളുടെയും ജീവിതാനുഭവങ്ങളുടെയും അടിസ്ഥാനത്തിൽ തന്നിരിക്കുന്ന നിഗമനങ്ങളെ ഞാൻ വിലയിരുത്തുന്നു.
12. തന്നിരിക്കുന്ന നിഗമനങ്ങൾ ശരിയാണോ എന്നറിയുന്നതിനാവശ്യമായ തെളിവുകൾ ശേഖരിക്കുന്ന പതിവ് എനിക്കില്ല.
13. ഞാൻ പതിവായി സ്വമേധയാ പഠനം നടത്തുന്നു.
14. പാഠഭാഗങ്ങൾ അദ്ധ്യാപകൻ ക്ലാസ്സിൽ പഠിപ്പിക്കുന്നതിന് മുമ്പ് ഞാൻ വായിക്കാറില്ല.
15. പാഠത്തോടൊപ്പം കൊടുത്തിരിക്കുന്ന മിക്ക അഭ്യാസങ്ങളും അദ്ധ്യാപകന്റെ നിർദ്ദേശമില്ലാതെ തന്നെ ഞാൻ ചെയ്യാറുണ്ട്.
16. പാഠങ്ങൾ കൂടുതലായി മനസ്സിലാക്കുന്നതിന് അതുമായി ബന്ധപ്പെട്ട മറ്റ് പുസ്തകങ്ങളും പ്രസിദ്ധീകരണങ്ങളും ഞാൻ വായിക്കാറില്ല.
17. പഠിച്ചുകൊണ്ടിരിക്കുമ്പോൾ പഠിച്ച കാര്യങ്ങൾ ഓർമ്മയിലുണ്ടോ എന്ന് ഞാൻ ഇടയ്ക്കിടെ പരിശോധിക്കാറുണ്ട്.
18. പഠിക്കാനിരിക്കുമ്പോൾ പരീക്ഷയിൽ ജയിക്കാനാവശ്യമായ വിവരങ്ങൾ മനസ്സിലാക്കുക മാത്രമാണ് എന്റെ ലക്ഷ്യം
19. ഞാൻ റിവിഷൻ നടത്തുന്നത് മറന്ന കാര്യങ്ങൾ വീണ്ടും ഓർമ്മിക്കുന്നതിനാണ്.
20. വായിക്കുന്ന കാര്യങ്ങൾ ഓർമ്മിച്ചു വെയ്ക്കുന്നതിനായി ഞാൻ ചില സൂത്രങ്ങൾ ഉപയോഗിക്കാറുണ്ട്.
21. അദ്ധ്യാപകർ ആവശ്യപ്പെടുന്ന പാഠഭാഗങ്ങൾ പതിവായി വായിക്കുന്ന ശീലം എനിക്കില്ല.
22. പാഠഭാഗത്തെക്കുറിച്ച് എനിക്കുണ്ടാകുന്ന സംശയങ്ങൾ അദ്ധ്യാപകരോട് ചോദിച്ച് നിവാരണം നടത്താറുണ്ട്.
23. പാഠഭാഗത്തെ ചോദ്യങ്ങളുടെ ഉത്തരങ്ങൾ തയ്യാറാക്കി ഞാൻ അദ്ധ്യാപകരെ കാണിക്കാറുണ്ട്.
24. പഠിക്കാൻ ബുദ്ധിമുട്ടുള്ള പാഠഭാഗങ്ങൾ ഒരിക്കൽക്കൂടി പഠിപ്പിക്കാൻ ഞാൻ അദ്ധ്യാപകരോട് ആവശ്യപ്പെടാറില്ല.
25. പരീക്ഷകളെ ഞാൻ പൊതുവെ ഭയപ്പെടാറില്ല.
26. എത്ര നന്നായി പഠിച്ചാലും പരീക്ഷയിൽ ഉയർന്ന മാർക്ക് കിട്ടില്ല എന്ന തോന്നൽ എനിക്കുണ്ട്.
27. പാഠഭാഗങ്ങൾ പൊതുവെ കടുപ്പമുള്ളതും പഠിക്കാൻ വിഷമമുള്ളതുമായി എനിക്ക് അനുഭവപ്പെടാറില്ല.
28. പരീക്ഷകളിൽ ഉയർന്ന മാർക്ക് വാങ്ങിയാലും നല്ല ഒരു ഭാവി ഉണ്ടാവില്ല എന്ന ഞാൻ കരുതുന്നു.
29. പഠിക്കുമ്പോൾ പരീക്ഷയിൽ ജയിക്കുക എന്ന ലക്ഷ്യം മാത്രമല്ല എന്റെ മനസ്സിലുണ്ടാവുക.
30. പരീക്ഷയിൽ തോൽക്കുമ്പോഴുണ്ടാകുന്ന അപമാനം ഒഴിവാക്കുന്നതിനുവേണ്ടിയാണ് ഞാൻ പഠിക്കുന്നത്.
31. പാഠ്യവിഷയങ്ങളിൽ പരമാവധി അറിവുനേടാൻ ഞാൻ ആഗ്രഹിക്കുന്നു.
32. മുതിർന്നവർ നിർബ്ബന്ധിക്കുമ്പോഴാണ് ഞാൻ പഠിക്കുന്നത്.
33. നല്ല ഒരു ജോലി നേടിയെടുക്കുന്നതിനുവേണ്ടിയാണ് ഞാൻ പഠിക്കുന്നത്.
34. പഠിച്ച കാര്യങ്ങൾ നിത്യജീവിതത്തിൽ പകർത്തുക എന്ന ലക്ഷ്യത്തോടെയാണ് ഞാൻ പഠിക്കുന്നത്.
35. രാഷ്ട്രപുരോഗതിക്കുവേണ്ടി പ്രവർത്തിക്കാൻ മികച്ച വിദ്യാഭ്യാസം ആവശ്യമാണെന്ന് ഞാൻ കരുതുന്നില്ല.
36. ഒരു വ്യക്തിക്ക് സമൂഹത്തിൽ ലഭിക്കുന്ന അംഗീകാരത്തിന് അയാളുടെ വിദ്യാഭ്യാസ നിലവാരവും കാരണമാണെന്ന് ഞാൻ വിശ്വസിക്കുന്നു.
37. പതിവായി ഹോം വർക്ക് ചെയ്യുന്ന ശീലം എനിക്കില്ല.
38. ക്ലാസ്സിൽ പഠിപ്പിക്കുന്ന പാഠഭാഗങ്ങൾ അതാതു ദിവസങ്ങളിൽ തന്നെ പഠിക്കുന്നതിനോട് എനിക്ക് യോജിപ്പില്ല.
39. ഒരു ടൈംടേബിൾ തയ്യാറാക്കി അതിനനുസരിച്ച് പഠിക്കുന്നത് നല്ലതാണെങ്കിലും എനിക്കതിനു കഴിയാറില്ല.
40. ഓരോ ദിവസത്തെയും പഠനപ്രവർത്തനങ്ങൾ നിശ്ചയിച്ച പ്രകാരം ഞാൻ പൂർത്തിയാക്കാറില്ല.
41. പഠിക്കാനുപയോഗിക്കുന്ന സമയം കൂടി കളിക്കാനാണ് എനിക്ക് താൽപര്യം.
42. പഠനം ഒരു മടുപ്പിക്കുന്ന അനുഭവമായി എനിക്ക് തോന്നാറില്ല.
43. എത്ര പഠിച്ചാലും പ്രയോജനമില്ലെന്ന് ഞാൻ കരുതുന്നില്ല.
44. പഠിക്കാതിരുന്നാലുള്ള പ്രശ്നങ്ങൾ ഒഴിവാക്കുന്നതിനു വേണ്ടിയാണ് ഞാൻ പഠിക്കുന്നത്.
45. പരീക്ഷകളിൽ ജയിക്കുക എന്നത് ഒരു വാശിയായിട്ടാണ് ഞാൻ കാണുന്നത്.
46. ക്ലാസ്സിലെ ഉയർന്ന റേങ്ക് നേടിയെടുക്കുക എന്ന ലക്ഷ്യത്തോടെയല്ല ഞാൻ പഠിക്കുന്നത്.
47. സമൂഹത്തിലെ ഉന്നത സ്ഥാനങ്ങൾ ലക്ഷ്യമാക്കിയാണ് ഞാൻ പഠിക്കുന്നത്.
48. ആത്മാർത്ഥമായി പരിശ്രമിച്ചാൽ ജീവിതത്തിൽ എന്തും നേടിയെടുക്കാം എന്ന വിശ്വാസമാണ് എന്നെ നയിക്കുന്നത്.
49. പാഠഭാഗത്തിലെ സമാന ആശയങ്ങളെ ഞാൻ നോട്ടുബുക്കിൽ പ്രത്യേകം രേഖപ്പെടുത്താറുണ്ട്.
50. പാഠഭാഗത്തിലെ ആശയങ്ങൾ ഉൾക്കൊള്ളിച്ചുകൊണ്ട് കഥകളോ കവിതകളോ ഉണ്ടാക്കാൻ ഞാൻ ശ്രമിക്കാറില്ല.

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51. പാഠഭാഗത്തിന്റെ ആശയങ്ങളുടെ പ്രത്യേകതകൾ നിരീക്ഷിച്ച് അവയുടെ വിശദാംശങ്ങൾ ഞാൻ ശേഖരിക്കാറുണ്ട്.
52. പാഠ്യവസ്തുവിന്റെ ഗുണഭോഷങ്ങളുടെ അടിസ്ഥാനത്തിൽ അവയെ വിലയിരുത്താൻ ഞാൻ ശ്രമിക്കാറില്ല.
53. പാഠഭാഗത്തിലെ പ്രധാന വസ്തുതകളുടെ ഒരു കുറിപ്പ് ഞാൻ തയ്യാറാക്കാറുണ്ട്.
54. നിഗമനങ്ങളെ വസ്തുതാപരമായ തെളിവുകൾ ഉപയോഗിച്ച് ഞാൻ പരിശോധിക്കാറുണ്ട്.
55. ആശയങ്ങളെ ഉൾക്കൊള്ളുന്നതിന് മുൻപ് അതിനാവശ്യമായ മുഴുവൻ വസ്തുതകളും ശേഖരിക്കാൻ ഞാൻ ശ്രമിക്കാറില്ല.
56. പാഠ്യവസ്തുവിലെ ആശയങ്ങളുടെ വിശദമായ അർത്ഥവും വ്യാപ്തിയും മനസ്സിലാക്കാൻ ഞാൻ ശ്രമിക്കാറില്ല.
57. പഠനം ആരംഭിച്ചാൽ എത്രയും പെട്ടെന്ന് നിഗമനങ്ങളിൽ എത്തിച്ചേരാൻ ഞാൻ ശ്രമിക്കുന്നു.
58. നിഗമനങ്ങളിൽ എത്തിച്ചേരുന്നതിനു മുൻപ് അതിനാവശ്യമായ വസ്തുതകൾ ഞാൻ വിശദമായി പരിശോധിക്കാറുണ്ട്.
59. പഠിക്കുമ്പോൾ ചില ഭാഗങ്ങൾ വിട്ടു കളഞ്ഞാലും നിഗമനങ്ങൾക്ക് ഞാൻ പ്രാധാന്യം കൊടുക്കുന്നു.
60. ശ്രദ്ധാപൂർവ്വവും വിശദവുമായ പഠനത്തിനു ശേഷമാണ് ഞാൻ നിഗമനങ്ങളിലേക്ക് കടക്കുന്നത്.
61. പാഠഭാഗത്തുനിന്നും ആശയങ്ങൾ ശേഖരിക്കുന്നതിനുമുൻപ് മുഴുവൻ വിശദാംശങ്ങളും ഞാൻ പരിശോധിക്കാറുണ്ട്.
62. ഒരു പാഠം പഠിക്കുന്നതിന് മറ്റുള്ളവർക്ക് ആവശ്യമുള്ളതിൽ കൂടുതൽ സമയം എനിക്കാവശ്യമാണ്.
63. ആശയങ്ങളും വസ്തുതകളും സ്വായത്തമാക്കുന്നതിനു മുൻപ് അതിന്റെ വിശദാംശങ്ങൾക്കു വേണ്ടി ഏറെ സമയം ഞാൻ ചെലവഴിക്കാറില്ല.
64. നിഗമനങ്ങളിൽ എത്തിച്ചേരുന്നതിനു മുൻപ് അതിന്റെ വിശദാംശങ്ങൾ വളരെയേറെ സമയം ഞാൻ വായിക്കാറുണ്ട്.

Appendix - II A
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
APPROACHES TO STUDYING INVENTORY
(DRAFT)
RESPONSE SHEET

വിദ്യാർത്ഥിയുടെ പേര് വയസ്സ്

ക്ലാസ് ക്ലാസ് നമ്പർ ആൺകുട്ടി/പെൺകുട്ടി

Sl. No.	എല്ലായ്പ്പോഴും	ചിലപ്പോഴൊക്കെ	ഒരിക്കലുമില്ല	Sl. No.	എല്ലായ്പ്പോഴും	ചിലപ്പോഴൊക്കെ	ഒരിക്കലുമില്ല	Sl. No.	എല്ലായ്പ്പോഴും	ചിലപ്പോഴൊക്കെ	ഒരിക്കലുമില്ല
1				22				43			
2				23				44			
3				24				45			
4				25				46			
5				26				47			
6				27				48			
7				28				49			
8				29				50			
9				30				51			
10				31				52			
11				32				53			
12				33				54			
13				34				55			
14				35				56			
15				36				57			
16				37				58			
17				38				59			
18				39				60			
19				40				61			
20				41				62			
21				42				63			
								64			

Appendix II.B
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

APPROACHES TO STUDYING INVENTORY (DRAFT)

Dr. P.K. Sudheesh Kumar
&
K.K. Shanmugha Das

Instructions: Read carefully each of the following statements. Three types of responses are given for each statement: (1) *Always* (2) *Sometimes* (3) *Never*. Decide your response to each statement and mark it in a separate response sheet provided by putting X in the relevant column. If you marked incorrectly put a circle around it (X) and mark X at the right place. Please mark your response for every statement.

Example :

1. Usually I study by myself

Always	Sometimes	Never
	X	

-
1. While studying I try to find out answers to the questions in my mind.
 2. I am not interested to know whether the learned ideas can be applied or not in real life.
 3. I conduct practically possible experiments and observations related to my lessons.
 4. While studying I do not try to understand the basis of content matter.
 5. While studying I do not check whether one subject is related with any other subjects or not.
 6. While studying a theory or law I am trying to find out its relations with other such theories and laws.
 7. The facts that I find out while studying is compared with the results of experiments and observations.
 8. While preparing notes if I notice that one content matter is related to another I do not record it separately.

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9. Using the available evidences I check whether the given conclusions are correct or not.
 10. I do not conduct practicable experiments to find out the genuineness of conclusions.
 11. I evaluate the conclusions on the basis of observations and experiences.
 12. I do not have the habit of collecting evidences to check the validity of conclusions.
 13. Usually I study by myself.
 14. I do not read my lessons before the teacher teaches them in the class.
 15. I do the exercises given with the lessons without a direction from my teacher.
 16. I do not read the other related books and publications to study more about my lessons.
 17. While studying I frequently check whether the learned facts are there in my mind or not.
 18. When I study my intention is to collect the information required for a pass in the examination.
 19. I conduct revision to recollect the forgotten facts.
 20. I adopt certain techniques for remembering the facts learned.
 21. I do not have the habit of reading the lessons as directed by the teacher.
 22. I clear my doubts about the lessons by asking teachers.
 23. I prepare answers to the questions given with the lessons and show them to my teacher.
 24. I do not demand my teachers to teach the difficult topics once again.
 25. I am not afraid of examinations.
 26. I am not hopeful of scoring high marks even if studied well.
 27. I do not feel that the lessons are tough and difficult to learn.
 28. Even if I scored high marks in the examinations I am not hopeful of a good future.
 29. While studying, my goal is not simply to pass the examination.
 30. I study to avoid the humiliation of failure in the examination.
 31. I like to acquire a thorough knowledge of the content matter.
 32. I study because of the compulsion of elders.
- 

33. I study for acquiring a good job.
34. I study for applying the acquired knowledge in real life.
35. I do not think that good education is required to work for the country.
36. I believe that education is also responsible for one's recognition in society.
37. I do not have the habit of doing home work regularly.
38. I do not like to study the lessons taught in the class on the same day itself.
39. Eventhough it is good to learn according to a timetable, I cannot to do so.
40. I do not complete the learning tasks of each day as scheduled.
41. I like to play even during the time meant for studying.
42. I do not feel that studying is a tedious experience.
43. I do not think that studying much is worth less.
44. I study to keep myself out of troubles.
45. I take passing the examinations as a challenge.
46. While studying, my goal is not acquiring the highest rank in the class.
47. I study with an intention of acquiring higher positions in society.
48. I am directed by the belief that anything can be achieved by a sincere effort.
49. I have the habit of recording the similar concepts in content material in a note book.
50. I do not try to make stories or poetry connecting the concepts in lessons.
51. I have the habit of collecting the details of concepts by observing their peculiarities.
52. I do not try to evaluate the content matter on the basis of their merits and demerits.
53. I have the habit of preparing a note of important facts in lessons.
54. I check the conclusions using empirical evidences.
55. Before assimilating the ideas I do not collect the required facts for it.
56. I do not try to understand the detailed meaning and scope of concepts in content matter.
57. I am trying to arrive at conclusions as soon as the study is begun.
58. Before arriving at conclusions I thoroughly check the facts required for it.

59. Even if some portions are skipped while studying, I give importance to conclusions.
60. I arrive at conclusions only after cautious and detailed study.
61. Before accepting concepts from study materials I thoroughly check every details related to it.
62. To study a lesson I need more time than others.
63. Before assimilating facts and concepts I do not spend much time for their details.
64. Before arriving at conclusions I study its details for long time.

Appendix II c
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
APPROACHES TO STUDYING INVENTORY
(DRAFT)
RESPONSE SHEET

Name of Student

Age

Class

Class No.

Boy / Girl

SI No.	Always	Sometimes	Never	SI No.	Always	Sometimes	Never	SI No.	Always	Sometimes	Never
1				22				44			
2				23				45			
3				24				46			
4				25				47			
5				26				48			
6				27				49			
7				28				50			
8				29				51			
9				30				52			
10				31				53			
11				32				54			
12				33				55			
13				34				56			
14				35				57			
15				36				58			
16				37				59			
17				38				60			
18				49				61			
19				40				62			
20				41				63			
21				42				64			
				43							

Appendix III
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
APPROACHES TO STUDYING INVENTORY (Final)
Dr. P.K. Sudheesh Kumar & K.K. Shanmugha Das

നിർദ്ദേശങ്ങൾ :

താഴെ കൊടുത്തിരിക്കുന്ന ഓരോ പ്രസ്താവനയും ശ്രദ്ധാപൂർവ്വം വായിക്കുക. ഓരോ പ്രസ്താവനയ്ക്കും 1. എല്ലായ്പ്പോഴും. 2. ചിലപ്പോൾ മാത്രം. 3. ഒരിക്കലുമില്ല എന്നിങ്ങനെ മൂന്ന് വീതം പ്രതികരണങ്ങൾ കൊടുത്തിരിക്കുന്നു. ഓരോ പ്രസ്താവനയും നിങ്ങളെ സംബന്ധിച്ചിടത്തോളം എത്രമാത്രം ശരിയാണെന്ന് തീരുമാനിക്കുക. ആ പ്രതികരണം പ്രത്യേകം തന്നിരിക്കുന്ന കടലാസിൽ ഓരോ പ്രസ്താവനയുടേയും നമ്പരിനുനേരെയുള്ള കോളത്തിൽ 'X' ചിഹ്നമിട്ട് രേഖപ്പെടുത്തുക. നിങ്ങൾ അടയാളപ്പെടുത്തിയ 'X' ചിഹ്നം തെറ്റായ സ്ഥാനത്താണെങ്കിൽ അതിനുചുറ്റും ഒരു വൃത്തം വരയ്ക്കുകയും (X) പുതിയ സ്ഥാനത്ത് 'X' ചിഹ്നം രേഖപ്പെടുത്തുകയും ചെയ്യുക. എല്ലാ പ്രസ്താവനകൾക്കും പ്രതികരണം രേഖപ്പെടുത്താൻ മറക്കരുത്.

മാതൃക:

ഞാൻ പതിവായി സ്വമേധയാ പഠനം നടത്തുന്നു.

എല്ലായ്പ്പോഴും	ചിലപ്പോൾ മാത്രം	ഒരിക്കലുമില്ല
	X	

1. പഠിക്കുന്ന വസ്തുതകളുടെ നിജസ്ഥിതി മനസ്സിലാക്കാൻ ഞാൻ സാധ്യമായ പരീക്ഷണങ്ങളും നിരീക്ഷണങ്ങളും നടത്താറുണ്ട്.
2. പഠിക്കുമ്പോൾ പാഠ്യവസ്തുവിന്റെ അടിസ്ഥാനം എന്താണെന്ന് മനസ്സിലാക്കാൻ ഞാൻ ശ്രമിക്കാറില്ല.
3. പഠിക്കുമ്പോൾ ഒരു വിഷയത്തിന് മനു വിഷയങ്ങളുമായി എന്തെങ്കിലും ബന്ധമുണ്ടോ എന്ന് ഞാൻ പരിശോധിക്കാറില്ല.
4. പഠിക്കുമ്പോൾ കണ്ടെത്തുന്ന വസ്തുതകളെ പരീക്ഷണ നിരീക്ഷണങ്ങളുടെ ഫലങ്ങളുമായി ഞാൻ താരതമ്യം ചെയ്തു നോക്കാറുണ്ട്.
5. നിരീക്ഷണങ്ങളുടെയും ജീവിതാനുഭവങ്ങളുടെയും അടിസ്ഥാനത്തിൽ തന്നിരിക്കുന്ന നിഗമനങ്ങളെ ഞാൻ വിലയിരുത്തുന്നു.
6. തന്നിരിക്കുന്ന നിഗമനങ്ങൾ ശരിയാണോ എന്നറിയുന്നതിനാവശ്യമായ തെളിവുകൾ ശേഖരിക്കുന്ന പതിവ് എനിക്കില്ല.
7. പാഠത്തോടൊപ്പം കൊടുത്തിരിക്കുന്ന മിക്ക അഭ്യാസങ്ങളും അദ്ധ്യാപകന്റെ നിർദ്ദേശമില്ലാതെ തന്നെ ഞാൻ ചെയ്യാറുണ്ട്.
8. പാഠങ്ങൾ കൂടുതലായി മനസ്സിലാക്കുന്നതിന് അതുമായി ബന്ധപ്പെട്ട മറ്റ് പുസ്തകങ്ങളും പ്രസിദ്ധീകരണങ്ങളും ഞാൻ വായിക്കാറില്ല.
9. പഠിച്ചുകൊണ്ടിരിക്കുമ്പോൾ പഠിച്ച കാര്യങ്ങൾ ഓർമ്മയിലുണ്ടോ എന്ന് ഞാൻ ഇടയ്ക്കിടെ പരിശോധിക്കാറുണ്ട്.
10. പഠിക്കാനിരിക്കുമ്പോൾ പരീക്ഷയിൽ ജയിക്കാനാവശ്യമായ വിവരങ്ങൾ മനസ്സിലാക്കുക മാത്രമാണ് എന്റെ ലക്ഷ്യം.
11. അദ്ധ്യാപകർ ആവശ്യപ്പെടുന്ന പാഠഭാഗങ്ങൾ പതിവായി വായിക്കുന്ന ശീലം എനിക്കില്ല.
12. പാഠഭാഗത്തെക്കുറിച്ച് എനിക്കുണ്ടാകുന്ന സംശയങ്ങൾ അദ്ധ്യാപകരോട് ചോദിച്ച് നിവാരണം നടത്താറുണ്ട്.
13. എത്ര നന്നായി പഠിച്ചാലും പരീക്ഷയിൽ ഉയർന്ന മാർക്ക് കിട്ടില്ല എന്ന തോന്നൽ എനിക്കുണ്ട്.
14. പരീക്ഷകളിൽ ഉയർന്ന മാർക്ക് വാങ്ങിയാലും നല്ല ഒരു ഭാവി ഉണ്ടാവില്ല എന്ന ഞാൻ കരുതുന്നു.
15. പഠിക്കുമ്പോൾ പരീക്ഷയിൽ ജയിക്കുക എന്ന ലക്ഷ്യം മാത്രമല്ല എന്റെ മനസ്സിലുണ്ടാവുക.
16. മുതിർന്നവർ നിർബ്ബന്ധിക്കുമ്പോഴാണ് ഞാൻ പഠിക്കുന്നത്.
17. പഠിച്ച കാര്യങ്ങൾ നിത്യജീവിതത്തിൽ പകർത്തുക എന്ന ലക്ഷ്യത്തോടെയാണ് ഞാൻ പഠിക്കുന്നത്.
18. ഒരു വ്യക്തിക്ക് സമൂഹത്തിൽ ലഭിക്കുന്ന അംഗീകാരത്തിന് അയാളുടെ വിദ്യാഭ്യാസ നിലവാരവും കാരണമാണെന്ന് ഞാൻ വിശ്വസിക്കുന്നു.

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19. പതിവായി ഹോം വർക്ക് ചെയ്യുന്ന ശീലം എനിക്കില്ല.
20. ഒരു ടൈംടേബിൾ തയ്യാറാക്കി അതിനനുസരിച്ച് പഠിക്കുന്നത് നല്ലതാണെങ്കിലും എനിക്കതിനു കഴിയാറില്ല.
21. പഠിക്കാനുപയോഗിക്കുന്ന സമയം കൂടി കളിക്കാനാണ് എനിക്ക് താൽപര്യം.
22. പഠനം ഒരു മടുപ്പിക്കുന്ന അനുഭവമായി എനിക്ക് തോന്നാറില്ല.
23. പരീക്ഷകളിൽ ജയിക്കുക എന്നത് ഒരു വാശിയായിട്ടാണ് ഞാൻ കാണുന്നത്.
24. ആത്മാർത്ഥമായി പരിശ്രമിച്ചാൽ ജീവിതത്തിൽ എന്തും നേടിയെടുക്കാം എന്ന വിശ്വാസമാണ് എന്നെ നയിക്കുന്നത്.
25. പാഠഭാഗത്തിലെ സമാന ആശയങ്ങളെ ഞാൻ നോട്ടുബുക്കിൽ പ്രത്യേകം രേഖപ്പെടുത്താറുണ്ട്.
26. പാഠ്യവസ്തുവിന്റെ ഗുണഭാഷങ്ങളുടെ അടിസ്ഥാനത്തിൽ അവയെ വിലയിരുത്താൻ ഞാൻ ശ്രമിക്കാറില്ല.
27. നിഗമനങ്ങളെ വസ്തുതാപരമായ തെളിവുകൾ ഉപയോഗിച്ച് ഞാൻ പരിശോധിക്കാറുണ്ട്.
28. പാഠ്യവസ്തുവിലെ ആശയങ്ങളുടെ വിശദമായ അർത്ഥവും വ്യാപ്തിയും മനസ്സിലാക്കാൻ ഞാൻ ശ്രമിക്കാറില്ല.
29. നിഗമനങ്ങളിൽ എത്തിച്ചേരുന്നതിനു മുൻപ് അതിനാവശ്യമായ വസ്തുതകൾ ഞാൻ വിശദമായി പരിശോധിക്കാറുണ്ട്.
30. ശ്രദ്ധാപൂർവ്വവും വിശദവുമായ പഠനത്തിനു ശേഷമാണ് ഞാൻ നിഗമനങ്ങളിലേക്ക് കടക്കുന്നത്.
31. പാഠഭാഗത്തുനിന്നും ആശയങ്ങൾ ശേഖരിക്കുന്നതിനുമുൻപ് മുഴുവൻ വിശദാംശങ്ങളും ഞാൻ പരിശോധിക്കാറുണ്ട്.
32. ഒരു പാഠം പഠിക്കുന്നതിന് മനുള്ളവർക്ക് ആവശ്യമുള്ളതിൽ കൂടുതൽ സമയം എനിക്കാവശ്യമാണ്.

Appendix III A
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
APPROACHES TO STUDYING INVENTORY
(Final)
RESPONSE SHEET

വിദ്യാർത്ഥിയുടെ പേര്

വയസ്സ്

ക്ലാസ്സ്

ക്ലാസ് നമ്പർ

ആൺകുട്ടി/പെൺകുട്ടി

SI No.	എല്ലായ്പ്പോഴും	ചിലപ്പോഴൊക്കെ	ഒരിക്കലുമില്ല	SI No.	എല്ലായ്പ്പോഴും	ചിലപ്പോഴൊക്കെ	ഒരിക്കലുമില്ല
1				17			
2				18			
3				19			
4				20			
5				21			
6				22			
7				23			
8				24			
9				25			
10				26			
11				27			
12				28			
13				29			
14				30			
15				31			
16				32			

Appendix III B
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

APPROACHES TO STUDYING INVENTORY (FINAL)

Dr. P.K. Sudheesh Kumar
&
K.K. Shanmugha Das

Instructions: Read carefully each of the following statements. Three types of responses are given for each statement: (1) *Always* (2) *Sometimes* (3) *Never*. Decide your response to each statement and mark it in a separate response sheet provided by putting X in the relevant column. If you marked incorrectly put a circle around it ☒ and mark X at the right place. Please mark your response for every statement.

Example :

1. Usually I study by myself

Always	Sometimes	Never
	X	

-
1. I conduct practically possible experiments and observations related to my lessons.
 2. While studying I do not try to understand the basis of content matter.
 3. While studying I do not check whether one subject is related with any other subjects or not.
 4. The facts that I find out while studying is compared with the results of experiments and observations.
 5. I evaluate the conclusions on the basis of observations and experiences.
 6. I do not have the habit of collecting evidences to check the validity of conclusions.
 7. I do the exercises given with the lessons without a direction from my teacher.
 8. I do not read the other related books and publications to study more about my lessons.

9. While studying I frequently check whether the learned facts are there in my mind or not.
 10. When I study my intention is to collect the information required for a pass in the examination.
 11. I do not have the habit of reading the lessons as directed by the teacher.
 12. I clear my doubts about the lessons by asking teachers.
 13. I am not hopeful of scoring high marks even if studied well.
 14. Even if I scored high marks in the examinations I am not hopeful of a good future.
 15. While studying, my goal is not simply to pass the examination.
 16. I study because of the compulsion of elders.
 17. I study for applying the acquired knowledge in real life.
 18. I believe that education is also responsible for one's recognition in society.
 19. I do not have the habit of doing home work regularly.
 20. Eventhough it is good to learn according to a timetable, I cannot to do so.
 21. I like to play even during the time meant for studying.
 22. I do not feel that studying is a tedious experience.
 23. I take passing the examinations as a challenge.
 24. I am directed by the belief that anything can be achieved by a sincere effort.
 25. I have the habit of recording the similar concepts in content material in a note book.
 26. I do not try to evaluate the content matter on the basis of their merits and demerits.
 27. I check the conclusions using empirical evidences.
 28. I do not try to understand the detailed meaning and scope of concepts in content matter.
 29. Before arriving at conclusions I thoroughly check the facts required for it.
 30. I arrive at conclusions only after cautious and detailed study.
 31. Before accepting concepts from study materials I thoroughly check every details related to it.
 32. To study a lesson I need more time than others.
- 

Appendix III c
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
APPROACHES TO STUDYING INVENTORY
(Final)
RESPONSE SHEET

Name of Student

Age

Class

Class No.

Boy / Girl

SI No.	Always	Sometimes	Never	SI No.	Always	Sometimes	Never
1				17			
2				18			
3				19			
4				20			
5				21			
6				22			
7				23			
8				24			
9				25			
10				26			
11				27			
12				28			
13				29			
14				30			
15				31			
16				32			

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Appendix IV

UNIVERSITY OF CALICUT

DEPARTMENT OF EDUCATION

SCALE OF CLASSROOM CLIMATE

Dr. P. Usha,
Lecturer
Department of education
University of Calicut

Sunitha E.P.
M.Ed. student
Department of Education
University of Calicut

നിർദ്ദേശങ്ങൾ

താഴെ കൊടുത്തിരിക്കുന്ന പ്രസ്താവനകൾ നിങ്ങളുടെ ക്ലാസ്സുമുമ്പിലെ പഠനവുമായി ബന്ധപ്പെട്ടവയാണ്. ഓരോ പ്രസ്താവനയ്ക്കും മുന്നൂറുവീതം പ്രതികരണങ്ങൾ തന്നിട്ടുണ്ട്. 1 മുതൽ 20 വരെയുള്ള പ്രസ്താവനകൾക്ക് യോജിക്കുന്നു, തീർച്ചയില്ല, വിരോധിക്കുന്നു എന്നീ പ്രതികരണങ്ങളും 21 മുതൽ 58 വരെയുള്ള പ്രസ്താവനകൾക്ക് എല്ലായ്പ്പോഴും ഉണ്ട്, ചിലപ്പോൾ മാത്രം ഉണ്ട്, ഒരിക്കലുമില്ല എന്നീ പ്രതികരണങ്ങളുമാണ് തന്നിട്ടുള്ളത്.

ഓരോ പ്രസ്താവനയും ശ്രദ്ധാപൂർവ്വം വായിച്ച്, അതിൽ പറയുന്ന കാര്യങ്ങൾ നിങ്ങളെ സംബന്ധിച്ചിടത്തോളം യഥാർത്ഥത്തിൽ എത്രമാത്രം ശരിയാണെന്ന് തീരുമാനിക്കുക. ആ പ്രതികരണമാണ് തന്നിരിക്കുന്ന ഉത്തരകടലാസിൽ രേഖപ്പെടുത്തേണ്ടത്.

തന്നിരിക്കുന്ന ഉത്തരകടലാസിൽ അതാത് പ്രസ്താവനകളുടെ നമ്പറിനെതിരെ നിങ്ങളുടെ ശരിയായ പ്രതികരണത്തിന് ചുവടെയുള്ള കോളത്തിൽ X ചിഹ്നം രേഖപ്പെടുത്തുക. നിങ്ങൾ ആദ്യം അടയാളപ്പെടുത്തിയ X ചിഹ്നം തെറ്റായ സ്ഥാനത്താണെങ്കിൽ അതിനുപുറും വൃത്തം (X) വരയ്ക്കുകയും പുതിയ സ്ഥാനത്ത് X ചിഹ്നം രേഖപ്പെടുത്തുകയും ചെയ്യുക.

എല്ലാ പ്രസ്താവനകൾക്കും പ്രതികരണം രേഖപ്പെടുത്തുവാൻ മറക്കരുത്.

1. കുട്ടികൾക്ക് അദ്ധ്യാപകനോട് സ്വതന്ത്രമായി ഇടപെടാൻ കഴിയാറുണ്ട്.
2. ചില കുട്ടികളെ പ്രത്യേക പ്രാധാന്യത്തോടെയാണ് അദ്ധ്യാപകൻ കാണാറുള്ളത്.
3. എല്ലാ കുട്ടികൾക്കും കാണുവാൻ കഴിയുന്ന വിധത്തിലാണ് ക്ലാസ്സിൽ ബോർഡ് സ്ഥാപിച്ചിട്ടുള്ളത്.
4. ക്ലാസ്സിലെ ഗ്രൂപ്പുകളുടെ പ്രവർത്തനം വിവരിച്ചുവെക്കുവാൻ ഗ്രൂപ്പ് ലീഡർമാർക്ക് സൗകര്യമുണ്ട്.
5. എല്ലാ കുട്ടികൾക്കും വ്യക്തമായി കേൾക്കേണ്ട രീതിയിലാണ് അദ്ധ്യാപകൻ ക്ലാസ്സെടുക്കാറുള്ളത്.
6. അദ്ധ്യാപകനോട് സംശയം ചോദിക്കുവാൻ കുട്ടികൾക്ക് പേടിയാണ്.
7. പഠിപ്പിക്കുമ്പോൾ അദ്ധ്യാപകൻ ഞങ്ങളെ ഓരോരുത്തരെയും ശ്രദ്ധിക്കുന്നതുപോലെ തോന്നാറുണ്ട്.
8. ക്ലാസ്സിലെ ചില കുട്ടികൾ, നിസ്സാരവഴക്കുകൾക്ക് കാരണകാരായിത്തീർന്നിട്ടുണ്ട്.
9. കുട്ടികൾക്ക് ക്ലാസ്സിൽ പാടോടുകൾ പ്രവർത്തനങ്ങൾ സംഘടിപ്പിക്കാനുള്ള സൗകര്യമുണ്ട്.
10. ക്ലാസ്സിൽ ആവശ്യത്തിന് വെളിച്ചം ലഭിക്കുന്നുണ്ട്.
11. എനിക്ക് എന്റെ അദ്ധ്യാപകരെ ഇഷ്ടമാണ്.
12. ഈ ക്ലാസ്സിൽ നിന്നും മാറി മറ്റേതെങ്കിലും ക്ലാസ്സിൽ ചേർന്നു പഠിക്കുവാനാണ് എനിക്ക് താല്പര്യം.
13. എന്റെ ക്ലാസ്സിലെ ചില കുട്ടികൾ ആലാപനം ശ്രദ്ധിക്കപ്പെടാത്തവരാണ്.
14. ക്ലാസ്സിലെ പ്രവർത്തനവുമായി സഹകരിക്കാത്ത ചില കുട്ടികൾ എന്റെ ക്ലാസ്സിലുണ്ട്.
15. ക്ലാസ്സിലെ മികച്ച കുട്ടിയായിത്തീരുവാൻ ഓരോരുത്തരും മത്സരിക്കാറുണ്ട്.
16. എന്റെ ക്ലാസ്സിനുവേണ്ടി എന്തും ചെയ്യാൻ ഞാൻ തയ്യാറാണ്.
17. എന്റെ ക്ലാസ്സിനുള്ളതിനേക്കാൾ കൂടുതൽ എനിക്കു മറ്റു ക്ലാസ്സുകളിലാണുള്ളത്.
18. ക്ലാസ്സിൽ പഠനസാമഗ്രികൾ സൂക്ഷിക്കുവാനുള്ള സൗകര്യമുണ്ട്.
19. ക്ലാസ്സ് മുറിയിൽ എല്ലാ കുട്ടികൾക്കും ഇരിക്കുവാനുള്ള സൗകര്യമുണ്ട്.
20. അദ്ധ്യാപകൻ ക്ലാസ്സിലെ കുട്ടികളിൽ വിശ്വാസം കുറവാണ്.

21. അദ്ധ്യാപകൻ ക്ലാസ്സിൽ സൗഹൃദപൂർവ്വം പെരുമാറാറുണ്ട്.
22. പാഠഭാഗങ്ങൾ ക്ലാസ്സിൽ അവതരിപ്പിക്കുവാനായി അദ്ധ്യാപകൻ ചാർട്ടുകൾ, മോഡലുകൾ ആദിയായ പഠനോപകരണങ്ങൾ ക്ലാസ്സിൽ ഉപയോഗിക്കാറുണ്ട്.
23. ക്ലാസ്സിൽ കുട്ടികളുടെ തെറ്റുകൾ അദ്ധ്യാപകൻ തിരുത്താറുണ്ട്.
24. ഓരോ പാഠഭാഗം പഠിപ്പിക്കുമ്പോഴും നിത്യജീവിതത്തിൽ അവയുടെ പ്രാധാന്യം അദ്ധ്യാപകൻ മനസ്സിലാക്കിത്തരാറുണ്ട്.
25. കുട്ടികളുടെ കഴിവുകൾ പ്രകടിപ്പിക്കുവാൻ അദ്ധ്യാപകൻ ക്ലാസ്സിൽ അവസരം ഒരുക്കി തരാറുണ്ട്.
26. പഠനസംബന്ധമായ പല പ്രവർത്തനങ്ങളും സ്വയം ചെയ്യുവാൻ അദ്ധ്യാപകൻ കുട്ടികളെ സഹായിക്കാറുണ്ട്.
27. പാഠമെടുക്കുമ്പോൾ എല്ലാ കുട്ടികളും അദ്ധ്യാപകനെ ശ്രദ്ധിച്ചിരിക്കാറുണ്ട്.
28. അദ്ധ്യാപകൻ ക്ലാസ്സിൽ കൃത്യസമയത്ത് എത്താറുണ്ട്.
29. കുട്ടികളുടെ വികാരങ്ങൾക്ക് അദ്ധ്യാപകർ പരിഗണന നൽകാറുണ്ട്.
30. ഓരോ ഗ്രൂപ്പിലേയും കുട്ടികളുടെ പഠനം, ഹോംവർക്ക് എന്നിവ അദ്ധ്യാപകൻ ശ്രദ്ധിക്കാറുണ്ട്.
31. പാഠപുസ്തകങ്ങൾക്കുപുറമെ വിജ്ഞാനപ്രദമായ പല പുസ്തകങ്ങളും വായിക്കുവാൻ അദ്ധ്യാപകർ പ്രേരിപ്പിക്കാറുണ്ട്.
32. ക്ലാസ്സിൽ കുട്ടികൾക്കിടയിലുള്ള പ്രശ്നങ്ങൾ ദൂരീകരിക്കുവാൻ അദ്ധ്യാപകൻ സഹായിക്കാറുണ്ട്.
33. വിവിധതരമുള്ള പാഠഭാഗങ്ങൾ അദ്ധ്യാപകൻ വളരെ വിശദമായി പറഞ്ഞു തരാറുണ്ട്.
34. ക്ലാസ്സിലെ കുട്ടികൾ പരസ്പരം സഹായിക്കാറുണ്ട്.
35. പഠനത്തിൽ പിന്നോക്കം വരുന്ന കുട്ടികൾക്ക് അദ്ധ്യാപകൻ പ്രത്യേക ശ്രദ്ധയും നൽകാറുണ്ട്.
36. പഠിപ്പിക്കുന്നതിനിടയിൽ പഠന പുരോഗതി അറിയുവാൻ അദ്ധ്യാപകൻ ചോദ്യങ്ങൾ ചോദിക്കാറുണ്ട്.
37. കുട്ടികളുമായി സംസാരിക്കുവാൻ അദ്ധ്യാപകൻ സമയം കണ്ടെത്താറുണ്ട്.
38. വളരെ വ്യതിയാനം ചിട്ടയോടുകൂടിയാണ് അദ്ധ്യാപകൻ ബോർഡിൽ എഴുതുന്നത്.
39. ക്ലാസ്സിലെ മിക്കരായ കുട്ടികളെ മറ്റുള്ള കുട്ടികൾ അഭിനന്ദിക്കാറുണ്ട്.
40. ക്ലാസ്സുതറു വൃത്തിയാക്കി സൂക്ഷിക്കുവാൻ കുട്ടികൾ ഒരുമിച്ചു പ്രവൃത്തിക്കാറുണ്ട്.
41. വിജ്ഞാനപ്രദമായ പല കാര്യങ്ങളും അദ്ധ്യാപകൻ ക്ലാസ്സിൽ പറഞ്ഞു തരാറുണ്ട്.
42. ചാർട്ടുകൾ മോഡലുകൾ തുടങ്ങിയ പഠനസഹായികൾ നിർമ്മിക്കുവാൻ അദ്ധ്യാപകൻ കുട്ടികളെ പരിശീലിപ്പിക്കാറുണ്ട്.
43. കുട്ടികൾ പറയുന്ന കാര്യങ്ങൾ അദ്ധ്യാപകൻ ശ്രദ്ധാപൂർവ്വം കേൾക്കാറുണ്ട്.
44. ചിന്തോദ്ദീപകരായ പല ചോദ്യങ്ങളും അദ്ധ്യാപകൻ ക്ലാസ്സിൽ ചോദിക്കാറുണ്ട്.
45. ശാസ്ത്രസംബന്ധമായ പ്രവർത്തനങ്ങൾ സ്വയം ചെയ്യാൻ എടുത്തു നൽകുന്നതിന് ക്ലാസ്സിലെ കുട്ടികൾ തുറന്നു വരാറുണ്ട്.
46. ക്ലാസ്സിലെ ചർച്ചകളിൽ എല്ലാ കുട്ടികളും അഭിപ്രായം പറയാറുണ്ട്.
47. എനിക്ക് അദ്ധ്യാപകരോട് ദേഷ്യം തോന്നാറുണ്ട്.
48. ക്ലാസ്സിലെ മത്സരങ്ങളിൽ വിജയിക്കുന്നവർക്ക് അദ്ധ്യാപകൻ പ്രോത്സാഹനം നൽകാറുണ്ട്.
49. ക്ലാസ്സിലെ കൂട്ടുകാരോട് ഞാൻ സ്നേഹപൂർവ്വം ഞാൻ പെരുമാറാറുണ്ട്.
50. ക്ലാസ്സിലെ കുട്ടികൾ പരസ്പരം കലഹിക്കാറുണ്ട്.
51. അദ്ധ്യാപകൻ ക്ലാസ്സിൽ അച്ചക്കം നിലനിർത്താറുണ്ട്.
52. ക്ലാസ്സുകളുടെ ആരംഭത്തിൽതന്നെ പാഠഭാഗങ്ങളോട് ബന്ധപ്പെട്ട മുന്നറിവ് അദ്ധ്യാപകൻ പരിശോധിക്കാറുണ്ട്.
53. താൻ ചെയ്യുന്നതെല്ലാമാണ് ശരിയെന്ന് അദ്ധ്യാപകൻ കരുതാറുണ്ട്.
54. ക്ലാസ്സിലെ കുട്ടികൾ അദ്ധ്യാപകനെ അനുസരിക്കാറുണ്ട്.
55. എന്നെ ഈ വർഷം പഠിപ്പിക്കുന്ന അദ്ധ്യാപകൻ അടുത്ത വർഷവും പഠിപ്പിക്കണമെന്ന് ഞാനാഗ്രഹിക്കാറുണ്ട്.
56. എന്റെ ക്ലാസ്സിലെ കുട്ടികൾ എന്നോട് മോശമായാണ് പെരുമാറാറുള്ളത്.
57. പൊതുവായ പല കാര്യങ്ങളും കുട്ടികൾ ക്ലാസ്സിൽ ചർച്ച ചെയ്യാറുണ്ട്.
58. കുട്ടികൾ ക്ലാസ്സിൽ ഇരിക്കുന്ന സ്ഥാനം അദ്ധ്യാപകൻ വ്യത്യാസപ്പെടുത്താറുണ്ട്.

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Appendix IV A

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
SCALE OF CLASSROOM CLIMATE

RESPONSE SHEET

വിദ്യാർത്ഥിയുടെ പേര് വയസ്സ്

ക്ലാസ്

ക്ലാസ് നമ്പർ

ആൺകുട്ടി/പെൺകുട്ടി

No.	യോജിക്കുന്നു	തീർച്ചയില്ല	വിയോജിക്കുന്നു	No.	എല്ലായ്പ്പോഴും	ചിലപ്പോൾ മാത്രം	ഒരിക്കലുമില്ല	Sl. No.	എല്ലായ്പ്പോഴും	ചിലപ്പോൾ മാത്രം	ഒരിക്കലുമില്ല
1				21				41			
2				22				42			
3				23				43			
4				24				44			
5				25				45			
6				26				46			
7				27				47			
8				28				48			
9				29				49			
10				30				50			
11				31				51			
12				32				52			
13				33				53			
14				34				54			
15				35				55			
16				36				56			
17				37				57			
18				38				58			
19				39							
20				40							

Appendix IV B
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

SCALE OF CLASSROOM CLIMATE

Dr. P.Usha
Lecturer
Department of Education
University of Calicut

Sunitha. E.P.
M.Ed. Student
Department of Education
University of Calicut

INSTRUCTIONS

The statements given below are related to your classroom learning. For each statement, three responses are given. For statements 1 to 20 three responses such as 'agree', 'undecided' and 'disagree' and for statements 21 to 58 responses such as 'always', 'sometimes' and 'never' are provided.

Read each statement carefully and find out to what extent they are correct, according to you. The correct responses has to be marked in the given response sheet.

In the answersheet, mark 'X' against the correct response of each statement according to their serial number. In case you have marked 'X' in the wrong column, draw a circle ⊗ around it and mark for the correct response. Don't forget to mark your response to all statements.

1. The students are free to mingle with the teacher.
2. The teacher use to show special importance to some students.
3. The blackboard is kept in such a position that it can be seen by all students in the class.
4. The group leaders are free to evaluate the performance of the groups in the class.
5. The teacher takes the class in such a way that it can be heard clearly by all students.
6. Students are scared to ask doubts to the teacher.

7. We feel that the teacher is paying attention to each of us, while teaching.
8. Some of the students are being responsible to the petty quarrels in the class.
9. The students are free to organize extra-curricular activities in the class.
10. Enough light is available in the class.
11. I like my teachers.
12. I desire to move from this class to another for my studies.
13. Some of the students in my class are being unnoticed by anyone.
14. There are some students who do not co-operate with the activities in the class.
15. Each student in the class is competing to be the best.
16. I am ready to do anything for my class.
17. I have more friends in other classes than in my class.
18. Arrangements are available in the classroom for keeping the learning materials.
19. Seating arrangements are there, for all students in the class.
20. The teacher is having less confidence in the students of the class.
21. The teacher is friendly in the class.
22. The teacher uses teaching aids like charts and models for introducing the topics effectively.
23. The teacher corrects the mistakes of students in the class.
24. The teacher use to explain the importance of each topic in the day to day life.
25. The teacher provides opportunities for the students in expressing their abilities.

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26. The teacher helps the students in carrying out the different learning exercises by themselves.
27. All the students listen to the teacher, while teaching lessons.
28. The teacher comes to the class in time.
29. The teacher takes into consideration the feelings of students.
30. The teacher cares for the study, homework etc. of students in each group.
31. The teacher compels the students to read different books for knowledge, apart from text books.
32. The teacher helps the students for solving the problems among them.
33. Difficult portions of the lessons are well explained by the teacher.
34. Students in the class help each other.
35. The teacher gives special coaching to the students who are found poor in studies.
36. The teacher asks questions to know the progress in study during the class.
37. The teacher finds time to talk with the students.
38. The teacher writes on the board, neatly and orderly.
39. Brilliant students of the class are being congratulated by other students.
40. The students work together to keep the class very neat.
41. The teacher talks about informative topics in the class.
42. The teacher trains the students for preparing aids like charts and models.
43. The teacher use to attend carefully to the views of the students in the class.
44. The teacher use to ask several thought provoking questions in the class.

45. The students of the class come forward to take up the science related activities by themselves.
46. During discussion in the class, all students express their opinions.
47. I feel angry with my teachers.
48. The teacher encourages those who succeed in the class competitions.
49. I behave affectionately, to my friends in the class.
50. Students of the class quarrel each other.
51. The teacher maintains discipline in the class.
52. The teacher use to test the previous knowledge of the students before introducing a lesson.
53. The teacher thinks that all his activities are correct.
54. Students of the class obey the teacher.
55. I hope that the teacher of this year should teach me in the coming year also.
56. Students of my class behave badly with me.
57. Many of the common issues are being discussed by students in the class.
58. The teacher makes changes in the seating arrangement of the students.

Appendix IV C

UNIVERSITY OF CALICUT DEPARTMENT OF EDUCATION SCALE OF CLASSROOM CLIMATE

RESPONSE SHEET

Name of the Student:

Age:

Class :

Class. No:

Boy/Girl

No	Agree	Uncertain	Disagree	No	Always	Sometimes	Never	No	Always	Sometimes	Never
1				21				41			
2				22				42			
3				23				43			
4				24				44			
5				25				45			
6				26				46			
7				27				47			
8				28				48			
9				29				49			
10				30				50			
11				31				51			
12				32				52			
13				33				53			
14				34				54			
15				35				55			
16				36				56			
17				37				57			
18				38				58			
19				39							
20				40							

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
Achievement Test in Social Sciences for Secondary
School Pupils. (Draft)

Dr. P.K. Sudheesh Kumar
&
K.K.Shanmugha Das.

നിർദ്ദേശങ്ങൾ :

ഇത് ഒരു സോഷ്യൽ സയൻസ് ടെസ്റ്റാണ്. ഓരോ ചോദ്യത്തിനും A,B,C,D എന്നീ ക്രമത്തിൽ നാല് ഉത്തരങ്ങൾ വീതം കൊടുത്തിരിക്കുന്നു. അവയിൽ ഒന്ന് മാത്രമാണ് ശരി. ഓരോ ചോദ്യത്തിന്റെയും ശരിയായ ഉത്തരം കണ്ടുപിടിക്കുക. ഉത്തരങ്ങൾ അടയാളപ്പെടുത്താനായി തന്നിരിക്കുന്ന കടലാസിൽ ഓരോ ചോദ്യനമ്പരിനും നേരെ A,B,C,D എന്നീ അക്ഷരങ്ങൾ രേഖപ്പെടുത്തിട്ടുണ്ട്. നിങ്ങളുടെ ശരി ഉത്തരത്തെ കുറിക്കുന്ന അക്ഷരത്തിനുമുകളിൽ 'X' എന്ന അടയാളമിട്ട് ഉത്തരങ്ങൾ രേഖപ്പെടുത്തുക. നിങ്ങളുടെ ഉത്തരം തെറ്റായ സ്ഥാനത്താണ് അടയാളപ്പെടുത്തിയത് എങ്കിൽ അതിനുചുറ്റും ഒരു വൃത്തം വരയ്ക്കുകയും ~~X~~ ശരിയായ സ്ഥാനത്ത് ചിഹ്നം ഇടുകയും ചെയ്യുക. എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരം അടയാളപ്പെടുത്താൻ മറക്കരുത്.

മാതൃക:

Qn. No.1. ഇന്ത്യയുടെ തലസ്ഥാനം എവിടെയാണ് ?

A. തിരുവനന്തപുരം B. മുംബായ് C. ന്യൂഡൽഹി D. കൊൽക്കത്ത

A	B	C	D
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1. മെസോപ്പൊട്ടേമിയൻ നിയമങ്ങൾ ക്രോഡീകരിച്ചതാര് ?
 A. ഹമ്മുറാബി B. കുഹു C. അലക്സാണ്ടർ D. നന്നാർ
2. പുരാതന ഈജിപ്തിലെ ജനങ്ങൾ ഉപയോഗിച്ചിരുന്ന അക്ഷരമാലയുടെ പേരെന്ത് ?
 A. ക്യൂണിഫോം B. ടെറാക്കോട്ട C. അറബിക് D. ഹൈറോഗ്ലിഫിക്സ്
3. താഴെ പറയുന്നവരിൽ സുപ്രസിദ്ധ ഗ്രീക്ക് കവി ആര് ?
 A. ഹെറോഡോട്ടസ് B. സോഫോക്ലീസ് C. ഹോമർ D. അരിസ്റ്റോട്ടിൽ
4. അറബി സാമ്രാജ്യത്തിന്റെ ആദ്യ തലസ്ഥാനം എവിടെയായിരുന്നു. ?
 A. മെക്ക B. മദീന C. ദമാസ്ക്കസ് D. ജിദ്ദ
5. ഇംഗ്ലണ്ടിലെ മഹത്തായ വിപ്ലവം നടന്ന വർഷമേത് ?
 A. 1688 B. 1878 C. 1808 D. 1668
6. ഹർഷന്റെ കാലത്ത് ഇന്ത്യ സന്ദർശിച്ച ചൈനീസ് സഞ്ചാരി ആര് ?
 A. ഫാഹിയാൻ B. ഹുയാൻസാങ് C. മാഹുവാൻ D. സൺയാറ്റ്സൺ
7. അന്തരീക്ഷത്തിലെ ഏറ്റവും താഴെയുള്ള മണ്ഡലമേത് ?
 A. ട്രോപ്പോസ്ഫിയർ B. ഹെറ്ററോസ്ഫിയർ C. സ്ട്രാറ്റോസ്ഫിയർ D. അയനോസ്ഫിയർ
8. അന്തരീക്ഷമർദ്ദം അളക്കുന്നതിനുള്ള ഉപകരണമേത് ?
 A. തെർമോമീറ്റർ B. അമ്മീറ്റർ C. ബാരോമീറ്റർ D. ഹൈഗ്രോമീറ്റർ
9. "നാലുമണി മഴ" എന്ന പേരിൽ അറിയപ്പെടുന്നത് താഴെ കൊടുത്തിരിക്കുന്നവയിൽ ഏതാണ് ?
 A. ശൈലവൃഷ്ടി B. ചക്രവാതവൃഷ്ടി C. തീരദേശവൃഷ്ടി D. സംവഹനവൃഷ്ടി
10. ലോകത്തിലെ അറിയപ്പെടുന്ന ഏറ്റവും വലിയ ഗർത്തത്തിന്റെ പേരെന്ത് ?
 A. പ്യൂട്ടോറിക്കോ ഗർത്തം B. ചാലഞ്ചർ ഗർത്തം
 C. വാർട്ടൻ ഗർത്തം D. മറിയാന ഗർത്തം

11. രണ്ട് വേലിയേറ്റങ്ങൾക്കിടയിലുള്ള സമയ വ്യത്യാസം എത്ര ?
A. 12 മണിക്കൂർ 25 മിനുട്ട് B. 10 മണിക്കൂർ 50 മിനുട്ട്
C. 10 മണിക്കൂർ 25 മിനുട്ട് D. 12 മണിക്കൂർ 50 മിനുട്ട്.
12. ഉത്തര മധ്യരേഖാ സമുദ്രജല പ്രവാഹം ഏഷ്യയുടെ കിഴക്കൻ തീരത്ത് ഏതുപേരിൽ അറിയപ്പെടുന്നു ?
A. ഓയാഷിയോ B. ഹംബോൾട്ട് ശീതജലപ്രവാഹം
C. ബ്രിട്ടീഷ് കൊളംബിയ പ്രവാഹം D. കുറോഷിയോ
13. പവിഴ നിരകൾ താഴെ പറയുന്നവയിൽ ഏതു ജീവികളാൽ നിർമ്മിതിമാണ് ?
A. പവിഴക്കാലിക്കുരുവി B. ഒക്ടോപസ് C. കോറൽ പാളികൾ D. ഞണ്ടുകൾ
14. ജീവജാലങ്ങളുടെ വളർച്ചയ്ക്ക് അനുയോജ്യമായ സമുദ്ര ഭാഗമേത് ?
A. അഗാധ സമുദ്രതലം B. വൻകരത്തട്ട് C. സമുദ്രാചലം D. വൻകരക്കയറ്റം
15. കൽക്കരിയുടെ ലോക കയറ്റുമതിയിൽ നാലിൽ ഒരുഭാഗം കൈയ്യടക്കിയിരിക്കുന്ന രാജ്യമേത് ?
A. ആസ്ട്രേലിയ B. അമേരിക്ക C. ഇന്ത്യ D. സൗദി അറേബ്യ
16. താഴെ പറയുന്നവയിൽ പുനസ്ഥാപിക്കപ്പെടാത്ത വിഭവമേത് ?
A. മത്സ്യം B. വനം C. കൽക്കരി D. ജലം
17. ഭരതനാട്യത്തിന്റെ ജൻമദേശമേത് ?
A. ആന്ധ്രാപ്രദേശ് B. കേരളം C. മഹാരാഷ്ട്രം D. തമിഴ്നാട്
18. ഒളിമ്പിക്സ് ആരംഭിച്ചത് ഏത് ദേവനെ പ്രീതിപ്പെടുത്തുന്നതിന് വേണ്ടിയായിരുന്നു ?
A. സൂര്യൻ B. അപ്പോളോ C. പോസിഡൺ D. പെരിക്ലിസ്
19. ഇന്ത്യൻ പാർലമെന്റിന്റെ ഉപരിമണ്ഡലമേത് ?
A. രാജ്യസഭ B. ലോക്സഭ C. കാബിനറ്റ് D. ലെജിസ്ലേറ്റീവ് അസംബ്ലി
20. ഒരു സംസ്ഥാനത്തിലെ ഏറ്റവും ഉയർന്ന കോടതിയുടെ പേരെന്ത് ?
A. സുപ്രീം കോടതി B. ഹൈക്കോടതി C. മുൻസിഫ് കോടതി D. സെഷൻസ് കോടതി
21. സ്വകാര്യ സ്വത്തിനെ അടിസ്ഥാനപ്പെടുത്തിയുള്ള സമ്പദ് വ്യവസ്ഥ ഏത് പേരിൽ അറിയപ്പെടുന്നു ?
A. മുതലാളിത്ത സമ്പദ് വ്യവസ്ഥ B. സോഷ്യലിസ്റ്റ് സമ്പദ് വ്യവസ്ഥ
C. വികസര സമ്പദ് വ്യവസ്ഥ D. മിശ്രസമ്പദ് വ്യവസ്ഥ
22. ഇന്ത്യയിലെ കേന്ദ്രബേങ്ക് ഏത് ?
A. സ്റ്റേറ്റ് ബേങ്ക് ഓഫ് ഇന്ത്യ B. ഇന്ത്യൻ വ്യവസായ വികസന ബേങ്ക്
C. റിസർവ് ബേങ്ക് ഓഫ് ഇന്ത്യ D. യൂണിയൻ ബേങ്ക് ഓഫ് ഇന്ത്യ
23. ഉൽപ്പാദന പ്രക്രിയയിൽ സംഘാടനത്തിന് കിട്ടുന്ന പ്രതിഫലം എന്ത് ?
A. കുലി B. പലിശ C. പാട്ടം D. ലാഭം
24. ഉൽപ്പാദന പ്രക്രിയയിൽ ഉപയോഗിക്കുന്ന എല്ലാ പ്രകൃതി വിഭവങ്ങളും ഏതുപേരിൽ അറിയപ്പെടുന്നു ?
A. മൂലധനം B. ഭൂമി C. ഘടകങ്ങൾ D. സംഘാടക വസ്തുക്കൾ
25. നവീന ശിലായുഗത്തിൽ മനുഷ്യനെ സ്ഥിരതാമസത്തിന് പ്രേരിപ്പിച്ച സാഹചര്യം എന്ത് ?
A. ഭക്ഷ്യോല്പാദനവും കന്നുകാലി സംരക്ഷണവും എളുപ്പമാക്കാൻ.
B. ശത്രുക്കളെ പരാജയപ്പെടുത്താൻ C. രാജ്യഭരണം സുഗമമാക്കാൻ.
D. വേട്ടയാടൽ എളുപ്പമാക്കാൻ.
26. മെസോപ്പൊട്ടേമിയൻ കലണ്ടറിന്റെ ന്യൂനത അത് താഴെ പറയുന്ന ഒന്നിനെ അടിസ്ഥാനപ്പെടുത്തി യുള്ളതാണ് എന്നതാണ്. അതെന്താണ് ?
A. സൂര്യൻ B. മാസങ്ങൾ C. ചന്ദ്രൻ D. ഭൂമി
27. ഈജിപ്തു സംസ്കാരത്തിന്റെ എടുത്തുപറയത്തക്ക സവിശേഷതയെന്ത് ?
A. സാമൂഹിക - സാമ്പത്തിക പുരോഗതി B. കാർഷിക - വ്യവസായിക പുരോഗതി
C. മികച്ച രാജ്യരക്ഷാ തന്ത്രങ്ങൾ D. വാസ്തു ശില്പ രംഗത്തെ മികവ്
28. സംസ്കാരങ്ങൾ ഉടലെടുക്കാൻ അനുയോജ്യമായത് എങ്ങനെയുള്ള പ്രദേശങ്ങളാണ് ?
A. തീരപ്രദേശങ്ങൾ B. നദീതടങ്ങൾ C. പീഠഭൂമികൾ D. സമതലങ്ങൾ
29. പുരാതന ചൈനയിൽ താമര, കുതിര, വ്യാളി എന്നിവയുടെ രൂപങ്ങൾ മനോഹരമായി ആലേഖനം ചെയ്തുവെച്ചിരിക്കുന്നു. ഇത് സൂചിപ്പിക്കുന്നതെന്ത് ?
A. അവയെ ആരാധിച്ചിരുന്നു B. താവോ മത വിശ്വാസം
C. വാസ്തുശില്പ വിദ്യയിലെ നൈപുണ്യം D. അക്കാലത്ത് ചിത്രലിപി നിലനിന്നിരുന്നു.
30. ഗ്രീക്ക് നഗരരാഷ്ട്രം എന്നതുകൊണ്ട് എന്താണ് അർത്ഥമാക്കുന്നത് ?
A. ഒരു നഗരത്തെ കേന്ദ്രീകരിച്ചുകൊണ്ടുള്ള പ്രദേശം B. നഗരങ്ങൾ ധാരാളമുള്ള ഒരു രാജ്യം
C. നഗരങ്ങളെ മാത്രം ആശ്രയിച്ചു കഴിയുന്ന ഒരു രാജ്യം D. നഗരങ്ങളാൽ ചുറ്റപ്പെട്ട ഒരു പ്രദേശം

31. റോമാക്കാരുടെ ഒരു സുപ്രധാന സംഭാവനയാണ് റോമൻ നിയമങ്ങൾ എന്നു പറയാൻ കാരണമെന്ത്?
 - A. ലോക നിയമങ്ങളെ ക്രോഡീകരിച്ചാണ് റോമൻ നിയമങ്ങൾ ഉണ്ടാക്കിയത്.
 - B. പല രാജ്യങ്ങളും നിയമ നിർമ്മാണത്തിന് റോമൻ നിയമങ്ങൾ മാതൃകയാക്കി.
 - C. ലോകത്ത് ആദ്യമായി നിയമനിർമ്മാണം നടത്തിയത് റോമാക്കാരായിരുന്നു.
 - D. റോമൻ നിയമങ്ങൾ ലോകതാല്പര്യം സംരക്ഷിക്കുന്നു.
32. മോസസിന്റെ വരവിനുശേഷം ജൂതന്മാരുടെ മതവിശ്വാസത്തിനുണ്ടായ ഒരു പ്രധാന മാറ്റം എന്ത്?
 - A. ബഹുദൈവ വിശ്വാസികളായി.
 - B. യേശുക്രിസ്തുവിനെ ആരാധിച്ചു.
 - C. തെരഞ്ഞെടുക്കപ്പെട്ട ജനത എന്നു വിശ്വസിച്ചു.
 - D. ഏകദൈവ വിശ്വാസികളായി.
33. മരണാനന്തര ജീവിതത്തിൽ മുസ്ലീങ്ങൾ വിശ്വസിക്കുന്നു എന്നു പറയാൻ കാരണമെന്ത്?
 - A. അവർ മരണാനന്തര കർമ്മങ്ങൾ ചെയ്യുന്നു.
 - B. ലോകജീവിതകാലത്തെ കർമ്മങ്ങൾക്ക് പരലോകത്ത് പ്രതിഫലം ലഭിക്കും എന്നു വിശ്വസിക്കുന്നു.
 - C. മറ്റ് മതവിശ്വാസികൾ അങ്ങനെ വിശ്വസിക്കുന്നു.
 - D. മൃതശരീരങ്ങളിൽ വൃത്തിയുള്ള വസ്ത്രം അണിയിക്കുന്നു.
34. ഇൻകരുടെ സാമ്രാജ്യത്തിലെ മാഷ്യൂപിഷ്യൂ നഗരാവശിഷ്ടങ്ങൾ എന്ത് സൂചിപ്പിക്കുന്നു?
 - A. മികച്ച സാമൂഹ്യ ജീവിതം.
 - B. നിരവധി ധാന്യ സംഭരണകേന്ദ്രങ്ങൾ.
 - C. എഞ്ചിനീയറിംഗിലും വാസ്തുശില്പകലയിലുമുള്ള പ്രാവീണ്യം.
 - D. അതൊരു ക്ഷേത്രനഗരമായിരുന്നു.
35. റോമാസാമ്രാജ്യത്തിൽ കൃസ്തുമതത്തെ അംഗീകരിക്കാനിടയായ സാഹചര്യം എന്ത്?
 - A. കൃസ്തുമതം റോമിൽ സാർവത്രികമായി.
 - B. എല്ലാ റോമക്കാരും കൃസ്ത്യാനികളായി.
 - C. കൃസ്തുമത സഭ ആവശ്യപ്പെട്ടു.
 - D. കൃസ്ത്യാനികൾ ആശ്രമ ജീവിതം നയിച്ചു.
36. നവോത്ഥാനത്തെ ജ്ഞാനോദയം എന്ന് വിശേഷിപ്പിക്കുന്നതെന്തുകൊണ്ട്?
 - A. പല പുതിയ കണ്ടുപിടുത്തങ്ങളും നടത്തപ്പെട്ടു.
 - B. മദ്ധ്യകാല യൂറോപ്പിൽ സംഭവിച്ചു.
 - C. പൗരാണിക ഗ്രീക്ക് - റോമാ സംസ്കാരങ്ങളെ അടിസ്ഥാനമാക്കിയുള്ള പഠനം നടത്തപ്പെട്ടു.
 - D. ഇറ്റലിയിൽ തുടക്കം കുറിക്കപ്പെട്ടു.
37. ലാറ്റിൻ ഭാഷ മദ്ധ്യകാല യൂറോപ്യൻ സംസ്കാരത്തിന്റെ വാഹനമായിരുന്നു എന്നു പറയുന്നതെന്തുകൊണ്ട്?
 - A. അക്കാലത്ത് ലാറ്റിൻ ഭാഷ മാത്രമാണ് ഉപയോഗത്തിലിരുന്നത്.
 - B. ലാറ്റിൻ ഭാഷ മാത്രമാണ് അനുയോജ്യം എന്ന് വിശ്വസിച്ചു.
 - C. ലാറ്റിൻ പുരാതന റോമിലെ ഭാഷയായിരുന്നു.
 - D. വിവിധ സാംസ്കാരിക-സാഹിത്യ പ്രവർത്തനങ്ങളിൽ ലാറ്റിൻ വ്യാപകമായി ഉപയോഗിക്കപ്പെട്ടു.
38. ഇംഗ്ലണ്ടിൽ രാജാവും പാർലമെന്റും തമ്മിലുള്ള ഏറ്റുമുട്ടലിനിടയാക്കിയ സാഹചര്യമെന്ത്?
 - A. രാജാവ് ജനഹിതമനുസരിച്ച് ഭരിക്കുന്നതിൽ പരാജയപ്പെട്ടു.
 - B. പാർലമെന്റ് അംഗങ്ങൾ അധികാര മോഹികളായിരുന്നു.
 - C. ജനങ്ങൾ രാജാവിനെ അനുകൂലിച്ചു.
 - D. രാജാധികാരം ദൈവദത്തമാണെന്ന് പാർലമെന്റ് അംഗീകരിച്ചു.
39. ബുദ്ധ - ജൈനമതങ്ങളുടെ അടിസ്ഥാന തത്വങ്ങൾ എന്തൊക്കെ?
 - A. ദൈവവിശ്വാസവും പ്രാർത്ഥനയും.
 - B. അഹിംസയും കർമ്മശുദ്ധിയും.
 - C. യാഗങ്ങളും പൂജാകർമ്മങ്ങളും.
 - D. വിഗ്രഹാരാധനയും സന്യാസവും.
40. കനിഷ്കൻ പുറത്തിറക്കിയ നാണയങ്ങളിൽ പല വിഭാഗക്കാരുടെയും ദൈവങ്ങളുടെ ചിത്രങ്ങൾ ഉണ്ടായിരുന്നു. ഇതിൽ നിന്നും എന്തു മനസ്സിലാക്കാം?
 - A. കനിഷ്കൻ ബഹുദൈവവിശ്വാസിയായിരുന്നു.
 - B. കനിഷ്കന്റെ നാണയങ്ങൾ എല്ലാ വിഭാഗക്കാരും ഉപയോഗിച്ചിരുന്നു.
 - C. അദ്ദേഹം എല്ലാ മതങ്ങളെയും ബഹുമാനിച്ചിരുന്നു.
 - D. കനിഷ്കന്റെ ഭരണകാലം സമ്പൽസമൃദ്ധമായിരുന്നു.
41. ഒരു ഉത്തരവാദിത്തമുള്ള പൗരന്റെ ലക്ഷണം താഴെ പറയുന്നവയിൽ ഏതാണ്?
 - A. അവകാശങ്ങളെക്കാൾ പ്രാധാന്യം ചുമതലകൾക്ക് നൽകുന്നു.
 - B. അവകാശങ്ങൾ അനുഭവിക്കുന്നതോടൊപ്പം ചുമതലകൾ കൂടി നിർവ്വഹിക്കുന്നു.
 - C. എല്ലാ നിയമങ്ങളും അനുസരിച്ച് ജീവിക്കുന്നു.
 - D. രാഷ്ട്രത്തിനുവേണ്ടി ആത്മസമർപ്പണം ചെയ്യുന്നു.

42. ഒരു പഞ്ചായത്തിന്റെ അടിസ്ഥാനപരമായ ചുമതല എന്താണെന്ന് പറയാം ?
 A. ഒരു ഗ്രാമത്തിന്റെ സാമൂഹികവും സാമ്പത്തികവുമായ പുരോഗതിക്കു വേണ്ടി പ്രവർത്തിക്കുക.
 B. ഒരു ഗ്രാമത്തിലെ മുഴുവൻ ജനങ്ങളെയും ഭരണത്തിൽ പങ്കാളികളാക്കുക.
 C. ഗ്രാമത്തിലെ മുഴുവൻ ജനങ്ങൾക്കും അവസര സമത്വം ഉറപ്പു വരുത്തുക.
 D. പഞ്ചായത്ത് ഭരണസമിതിയെ യഥാസമയം തെരഞ്ഞെടുക്കുക.
43. നമ്മുടെ രാഷ്ട്രത്തിന് ഒരു ഫെഡറൽ ഗവൺമെന്റിന്റെ ഘടനയാണെന്ന് പറയാൻ കാരണമെന്ത് ?
 A. കേന്ദ്ര ഗവൺമെന്റിന് സംസ്ഥാന ഗവൺമെന്റുകളെ പിരിച്ചുവിടാൻ അധികാരം ഉണ്ട്.
 B. കേന്ദ്ര ഗവൺമെന്റും സംസ്ഥാന ഗവൺമെന്റുകളും ചേർന്ന ഒരു യൂണിയനാണ്.
 C. കേന്ദ്ര ഗവൺമെന്റിന് സംസ്ഥാന ഗവൺമെന്റുകളെക്കാൾ അധികാരം ഉണ്ട്.
 D. സംസ്ഥാന ഗവൺമെന്റുകൾ കേന്ദ്ര ഗവൺമെന്റിനെ ആശ്രയിച്ച് പ്രവർത്തിക്കുന്നു.
44. ഇന്ത്യ ഒരു മതേതര രാഷ്ട്രമാണെന്ന് പറയുന്നതെന്തുകൊണ്ട് ?
 A. ഏതെങ്കിലും ഒരു മതത്തിൽ മാത്രം വിശ്വസിക്കാനും അത് പ്രചരിപ്പിക്കാനും ഉള്ള സ്വാതന്ത്ര്യം ഇല്ല. B. ഏതെങ്കിലും ഒരു മതത്തിൽ മാത്രം വിശ്വസിക്കാനും അത് പ്രചരിപ്പിക്കാനും ഉള്ള സ്വാതന്ത്ര്യം ഉണ്ട്. C. ഇഷ്ടമുള്ള മതത്തിൽ വിശ്വസിക്കാനും അത് പ്രചരിപ്പിക്കാനും ഉള്ള സ്വാതന്ത്ര്യം ഉണ്ട്. D. മത വിശ്വാസം പാടില്ല.
45. താഴെ പറയുന്ന നിയമങ്ങളിൽ ഒന്ന് സംസ്ഥാന ഗവർണ്ണറുടെ അധികാര പരിധിയിൽ പെടാത്തതാണ്. ഏതാണ് അത് ?
 A. ജില്ലാ ജഡ്ജിമാർ B. ഹൈക്കോടതിയിലെ ജഡ്ജിമാർ
 C. സംസ്ഥാനത്തെ ഉന്നത ഉദ്യോഗസ്ഥന്മാർ D. മുഖ്യമന്ത്രി
46. താഴെ കൊടുത്തിരിക്കുന്നവയിൽ തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങൾക്ക് ചുമത്താൻ അധികാരമുള്ളതേത് ?
 A. വരുമാനനികുതി B. തൊഴിൽ നികുതി C. വിൽപന നികുതി D. ഇറക്കുമതി ചൂങ്കം
47. ഭൂമി ഒരു ജലഗ്രഹം എന്ന് വിശേഷിപ്പിക്കപ്പെടുന്നത് എന്തുകൊണ്ട് ?
 A. ഭൂവിസ്തൃതിയുടെ മുന്നിൽ രണ്ടു ഭാഗവും ജലമാണ് B. ധാരാളം മഴ ലഭിക്കുന്നു
 C. ഭൂമിയിൽ ജലം വിവിധ അവസ്ഥകളിൽ സ്ഥിതി ചെയ്യുന്നു
 D. ഭൂമിയിൽ നിരവധി മഹാസമുദ്രങ്ങൾ ഉണ്ട്.
48. ഹോമോസഫിയറിന് ആ പേര് ലഭിക്കാൻ കാരണമെന്ത് ?
 A. ഈ ഭാഗത്ത് ഊഷ്മാവ് ഏറെക്കുറെ മാറ്റമില്ലാതെ തുടരുന്നു.
 B. ഇവിടെ അന്തരീക്ഷമർദ്ദം എപ്പോഴും സ്ഥിരമായിരിക്കും
 C. ഈ മേഖലയിലെ ഏതു ഭാഗത്തും വായുവിന് ഒരേ ഘടനയാണ്
 D. ഈ ഭാഗത്ത് ഊഷ്മാവ് വർദ്ധിക്കുമ്പോൾ മർദ്ദം കുറയുന്നു.
49. അയനോസഫിയറിന്റെ സാന്നിധ്യം മനുഷ്യർക്ക് ഉപയോഗപ്പെടുന്നതെങ്ങനെ ?
 A. കാലാവസ്ഥാ പ്രവചനത്തിന് B. ഹ്രസ്വദൂര റേഡിയോ പ്രക്ഷേപണത്തിന്
 C. ദീർഘദൂര റേഡിയോ പ്രക്ഷേപണത്തിന് D. അൾട്രാ വയലറ്റ് രശ്മികളെ കണ്ടെത്തുന്നതിന്
50. ഉന്നത അക്ഷാംശങ്ങളിലെ താപനില കുറഞ്ഞിരിക്കാൻ കാരണമെന്ത് ?
 A. അവ ഉയർന്ന പ്രദേശങ്ങൾ ആയതുകൊണ്ട്.
 B. സൂര്യരശ്മി വളരെ ദൂരം അന്തരീക്ഷത്തിലൂടെ സഞ്ചരിച്ചു മാത്രം അവിടെ എത്തിച്ചേരുന്നു
 C. ധ്രുവപ്രദേശങ്ങൾ ഐസ് മൂടിക്കിടക്കുന്ന പ്രദേശങ്ങളാണ്.
 D. സൂര്യരശ്മികൾ അവിടെ നേരിട്ട് പതിക്കുന്നു.
51. മഴനിഴൽ പ്രദേശങ്ങളിൽ മഴ കുറവാണ് എന്നതിൽ നിന്നും എന്ത് മനസ്സിലാക്കാം ?
 A. അവിടെ വനനശീകരണം നടന്നിരിക്കുന്നു.
 B. അവിടങ്ങളിൽ വീശുന്ന കാറ്റ് നീരാവി രഹിതമാണ്.
 C. അവിടങ്ങളിൽ കാറ്റ് വിപരീത ദിശകളിൽ വീശുന്നു.
 D. അവിടെ പർവ്വതങ്ങൾ കുറവാണ്.
52. ധ്രുവ പ്രദേശങ്ങൾ ഉച്ച മർദ്ദ മേഖലകളായി നിലനിൽക്കുന്നത് എന്തുകൊണ്ട് ?
 A. അവിടെ മനുഷ്യവാസമില്ല. B. അതിശൈത്യം അനുഭവപ്പെടുന്നു.
 C. വളരെ ഉയർന്ന മേഖലകളാണ്. D. വായുവിന്റെ അളവ് കുറവാണ്.
53. പശ്ചിമ ഘട്ടങ്ങളെ ഒരു നീർമറി പ്രദേശം എന്ന് വിളിക്കുന്നതെന്തുകൊണ്ട് ?
 A. ധാരാളം നദികൾ ഇവിടെനിന്നും ഉത്ഭവിക്കുന്നു.
 B. അത് രണ്ട് നീരാഴിക്കു തടങ്ങളെ തമ്മിൽ വേർതിരിക്കുന്നു.
 C. ഉയർന്ന അളവിൽ മഴ ലഭിക്കുന്ന പർവ്വതമേഖലയാണ്.
 D. രണ്ട് പ്രധാന നദികൾ ഇതിലെ ഒഴുകുന്നു.

54. ജലം നീരാവിയായി വീണ്ടും അന്തരീക്ഷത്തിൽ എത്തിച്ചേരുന്നതിന് എന്തു പറയുന്നു ?
A. ഓക്സിജൻ പരിവൃത്തി B. സംവഹനവൃഷ്ടി C. വർഷണം D. ജലപരിവൃത്തി.
55. സിംഹത്തെ ഒരു മദ്ധ്യമ ഉപഭോക്താവ് എന്നു പറയുന്നത് എന്തുകൊണ്ട് ?
A. പ്രാഥമിക ഉപഭോക്താക്കളെ ആഹാരമാക്കുന്നു. B. മദ്ധ്യമ ഉപഭോക്താക്കളെ ആഹാരമാക്കുന്നു
C. തൃതീയ ഉപഭോക്താക്കളെ ആഹാരമാക്കുന്നു D. മാംസഭുക്കുകളെ ആഹാരമാക്കുന്നു.
56. വിഘാടകരെ ഭൂമിയുടെ രക്ഷാപ്രവർത്തകർ എന്നു പറയുന്നതെന്തുകൊണ്ട് ?
A. നിർജ്ജീവ ജന്തു സസ്യങ്ങളെ കേടുകൂടാതെ സംരക്ഷിക്കുന്നു.
B. നിർജ്ജീവ ജന്തു സസ്യ ശരീരങ്ങളെ വിഘടിപ്പിക്കുന്നു.
C. ബാക്ടീരിയകളെയും ഫംഗസുകളെയും വിഘടിപ്പിക്കുന്നു.
D. ബാക്ടീരിയകളെയും ഫംഗസുകളെയും സംരക്ഷിക്കുന്നു.
57. താഴെ പറയുന്നവയിൽ പെസഫിക് സമുദ്രത്തിന്റെ പ്രത്യേകത എന്താണ്. ?
A. നല്ല കാലാവസ്ഥ അനുഭവപ്പെടുന്നു. B. ഏറ്റവും ആഴം കൂടിയതും വിസ്തൃതവുമാണ്
C. നിരവധി ഗർത്തങ്ങൾ ഉണ്ട്. D. ധാരാളം ശീതജല പ്രവാഹങ്ങളുണ്ട്.
58. ചെറിയ ഗോളമായ ചന്ദ്രൻ വേലിയേറ്റം സൃഷ്ടിക്കാൻ ഭീമാകാരമായ സൂര്യനേക്കാൾ കഴിവുണ്ട് എന്നതിൽ നിന്നും എന്തു മനസ്സിലാക്കാം ?
A. ഭൂമി സൗരയൂഥത്തിലെ ഒരു ചെറിയ ഗോളമാണ്.
B. സൂര്യന്റെ ആകർഷണബലം ഭൂമിയിൽ വളരെ കുറവാണ്.
C. സൂര്യന്റെ ആകർഷണബലം സൗരയൂഥത്തിൽ ചിതറിപ്പോകുന്നു
D. ചന്ദ്രൻ സൂര്യനേക്കാൾ ആകർഷണ ശക്തിയുണ്ട്.
59. കൽക്കരിയെ ഒരു ജീവാശ്മ ഇന്ധനം എന്നു വിളിക്കുന്നതിൽ നിന്നും എന്തർത്ഥമാക്കുന്നു ?
A. നിരവധി വർഷങ്ങളായി മനുഷ്യൻ ഇതുപയോഗിക്കുന്നു.
B. ജീവജാലങ്ങളുടെ നിലനില്പിനാധാരം കൽക്കരിയാണ്.
C. ചെടികളുടെ വളർച്ചയ്ക്ക് കൽക്കരിയും സൗരോർജ്ജവും ആവശ്യമാണ്.
D. യുഗങ്ങൾക്ക് മുമ്പ് ചെടികൾ സംഭരിച്ചു വെച്ച സൗരോർജ്ജമാണ് കൽക്കരി.
60. സൂര്യനിൽ ഊർജ്ജം ഉല്പാദിപ്പിക്കപ്പെടുന്നത് എങ്ങനെ ?
A. ഹൈഡ്രജൻ നൈട്രജനായി മാറ്റപ്പെടുന്നു. B. ഹീലിയം ഹൈഡ്രജനായി മാറ്റപ്പെടുന്നു.
C. ഹൈഡ്രജൻ ഹീലിയമായി മാറ്റപ്പെടുന്നു. D. നൈട്രജൻ ഹൈഡ്രജനായി മാറ്റപ്പെടുന്നു.
61. സ്വതന്ത്ര കമ്പോള വ്യവസ്ഥയുടെ സ്വഭാവമെന്ത് ?
A. ഗുണമേന്മയുള്ള സാധനങ്ങൾ മാത്രം കമ്പോളത്തിൽ വിൽക്കപ്പെടുന്നു.
B. കമ്പോളമേഖലയിലുള്ള വർദ്ധിച്ച ഗവൺമെന്റ് ഇടപെടൽ.
C. മുഴുവൻ സാധനങ്ങളും കമ്പോളത്തിലൂടെ മാത്രം വിൽക്കപ്പെടുന്നു.
D. കമ്പോളമേഖലയിലുള്ള ഉയർന്ന ഉല്പാദനം.
62. വിലസംവിധാനത്തെ സമ്പദ് വ്യവസ്ഥയുടെ അഭ്യൂതം എന്ന് വിളിക്കാൻ കാരണമെന്ത് ?
A. ഇത് സമ്പദ്വ്യവസ്ഥയുടെ വളർച്ചയെ സ്വാധീനിക്കുന്നു.
B. ഇത് ഉല്പാദനത്തെ സ്വാധീനിക്കുന്നില്ല. C. ഇത് വിലക്കയറ്റം ഉണ്ടാക്കുന്നു.
D. ഇതാണ് ഉല്പാദന പ്രവർത്തനങ്ങളെ നിയന്ത്രിക്കുന്നത്.
63. ഇന്ത്യയെ ഒരു മിശ്ര സമ്പദ് വ്യവസ്ഥ എന്നു വിളിക്കുന്നതെന്തുകൊണ്ട് ?
A. മുതലാളിത്തത്തിന്റെയും സോഷ്യലിസത്തിന്റെയും നല്ല വശങ്ങൾ ഉൾക്കൊള്ളുന്നു
B. സോഷ്യലിസ്റ്റ് ആശയങ്ങൾക്ക് ഉയർന്ന പരിഗണന നൽകുന്നു.
C. ഇന്ത്യൻ ഭരണഘടനയിൽ അങ്ങനെ വ്യക്തമാക്കിയിരിക്കുന്നു.
D. ഇന്ത്യയ്ക്ക് ഉയർന്ന വളർച്ചാ നിരക്കുണ്ട്.
64. നാണുപ്പെരുപ്പം സാധാരണ ജനങ്ങളെയാണ് ഏറ്റവും കൂടുതൽ ബാധിക്കുന്നത് എന്ന് പറയുന്നത് എന്തുകൊണ്ട് ?
A. വില വർദ്ധനവ് ഉണ്ടാകുന്നു. B. ലാഭനിരക്ക് വർദ്ധിക്കുന്നു.
C. ഉല്പാദനം കുറയുന്നു. D. പണ ദൗർലഭ്യം ഉണ്ടാകുന്നു.
65. ബാങ്കുകൾ, ഇൻഷുറൻസ് കമ്പനികൾ, റെയിൽവേ തുടങ്ങിയവയെ തൃതീയ മേഖല എന്ന് പറയുന്നതെന്തുകൊണ്ട് ?
A. അവ സാമ്പത്തിക വികസനത്തിന്റെ അടിസ്ഥാന മേഖലകളാണ്. B. സേവന മേഖലകളാണ്.
C. അവ പൊതുമേഖലാ സ്ഥാപനങ്ങളാണ് D. മനുഷ്യൻ ഇവ പ്രധാനപ്പെട്ടവയാണ്.

66. ഇന്ത്യയുടെ ദേശീയ വരുമാനത്തിന്റെ 45% വും വെറും 10% ആളുകളുടെ കൈകളിൽ കേന്ദ്രീകരിക്കപ്പെട്ടിരിക്കുന്നു. ഇതിൽ നിന്നും എന്തു മനസ്സിലാക്കാം ?
 A. ഇന്ത്യ ഒരു ദരിദ്ര രാഷ്ട്രമാണ് B. സാമ്പത്തിക അസമത്വം നിലനിൽക്കുന്നു
 C. ഇന്ത്യക്കാരിൽ ഭൂരിപക്ഷവും പാവങ്ങളാണ്. D. താഴ്ന്ന വളർച്ചാ നിരക്ക്.
67. മെസോപ്പൊട്ടേമിയൻ കലണ്ടറിന്റെ ന്യൂനത പരിഹരിച്ചുകൊണ്ട് നിങ്ങൾ ഏതു തരം കലണ്ടർ നിർമ്മിക്കും ?
 A. ചന്ദ്രനെ അടിസ്ഥാനപ്പെടുത്തിയുള്ള കലണ്ടർ B. സൂര്യനെ അടിസ്ഥാനപ്പെടുത്തിയുള്ള കലണ്ടർ
 C. ദിവസങ്ങളുടെ എണ്ണം തുല്യമായ കലണ്ടർ
 D. ഭൂമിയുടെ ഭ്രമണ വേഗത അടിസ്ഥാനപ്പെടുത്തിയുള്ള കലണ്ടർ
68. ലാവോന്തെയുടെയും കൺഫ്യൂഷ്യസിന്റെയും പ്രബോധനങ്ങൾ ഇക്കാലത്ത് നിങ്ങൾ എങ്ങനെ പ്രയോജനപ്പെടുത്തും ?
 A. സാമൂഹികവും സാൻമാർഗികവുമായ ഉന്നമനത്തിന് വേണ്ടി
 B. സാമ്പത്തിക പുരോഗതിക്കുവേണ്ടി C. മതേതരത്വത്തിനും ജനാധിപത്യത്തിനും വേണ്ടി
 D. ചൈനക്കാരെക്കുറിച്ച് ഇന്ത്യയിലെ ജനങ്ങളെ പ്രബുദ്ധരാക്കാൻ
69. ബുദ്ധ-ജൈനമത തത്വങ്ങൾക്ക് നിങ്ങളുടെ ജീവിതത്തിൽ എന്തു സ്വാധീനമാണുള്ളത് ?
 A. അഹിംസയിലും വേദങ്ങളിലുമുള്ള വിശ്വാസം
 B. യാഗങ്ങളിലും അഷ്ടാംഗമാർഗങ്ങളിലുമുള്ള വിശ്വാസം
 C. അഹിംസയിലും സത്കർമ്മങ്ങളിലും അധിഷ്ഠിതമായ ജീവിതം
 D. ദിവസവും ഈശ്വര പ്രാർത്ഥനയും പുജയും നടത്തൽ
70. ഇംഗ്ലണ്ടിലെ മഹത്തായ വിപ്ലവം നൽകുന്ന സന്ദേശത്തെ നിങ്ങളുടെ ജീവിതത്തിൽ എങ്ങനെ പ്രയോജനപ്പെടുത്തും?
 A. ഭരണകൂടത്തെ എതിർക്കാൻ ജനങ്ങളെ പ്രേരിപ്പിക്കും
 B. ഭരണാധികാരികളെ ജനഹിതമനുസരിച്ച് ഭരിക്കാൻ പ്രേരിപ്പിക്കും
 C. പാർലമെന്റിനുമാത്രം അധികാരമുള്ള ഒരു ഭരണത്തിനു വേണ്ടി ശ്രമിക്കും
 D. ജനങ്ങൾക്ക് പൂർണ്ണ സ്വാതന്ത്ര്യം അനുവദിക്കാൻ ഭരണാധികാരികളെ പ്രേരിപ്പിക്കും.
71. കഥകളിയെക്കുറിച്ച് വിശദമായി മനസ്സിലാക്കാൻ നിങ്ങൾ എന്തുചെയ്യും?
 A. ഭരതമുനിയുടെ നാട്യശാസ്ത്രം വായിക്കും. B. കഥകളിയുടെ അവതരണം പതിവായി കാണും.
 C. കഥകളി മത്സരം സംഘടിപ്പിക്കും. D. കേരള കലാമണ്ഡലത്തിൽ പഠനം നടത്തും.
72. ആര്യന്മാരുടെകാലത്തെ 'സഭ', 'സമിതി' എന്നിവയെക്കുറിച്ച് കൂടുതലായി അറിയാൻ നിങ്ങൾ എന്താണ് പഠിക്കേണ്ടത്?
 A. ഹാർപ്പൻ സംസ്കാരത്തിന്റെ അവശിഷ്ടങ്ങൾ B. ഉപനിഷത്തുക്കൾ
 C. ഇതിഹാസങ്ങൾ D. വേദങ്ങൾ
73. ഗ്രാമങ്ങളുടെ സാമ്പത്തിക - സാമൂഹിക പ്രശ്നങ്ങൾ പരിഹരിക്കുന്നതിന് നിങ്ങൾക്ക് എന്ത് ചെയ്യാൻ കഴിയും?
 A. തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങളുടെ മികച്ച പ്രവർത്തനം ഉറപ്പാക്കുക.
 B. പ്രശ്ന പരിഹാരത്തിന് സംസ്ഥാന സർക്കാരിനെ പ്രേരിപ്പിക്കുക.
 C. പഞ്ചായത്ത് തെരഞ്ഞെടുപ്പിൽ മുഴുവൻ ഗ്രാമീണ ജനതയെയും വോട്ടു ചെയ്യിപ്പിക്കുക.
 D. എല്ലാ ഗ്രാമങ്ങളിലും വിദ്യാലയങ്ങൾ ആരംഭിക്കുക.
74. നിങ്ങളുടെ അഭിപ്രായപ്രകടന സ്വാതന്ത്ര്യത്തെ ഭരണാധികാരികൾ തടയുകയാണെങ്കിൽ അത് സംരക്ഷിക്കാൻ നിങ്ങൾ ആരെ സമീപിക്കും?
 A. സംസ്ഥാന ഗവർണ്ണറെ B. മുൻസിഫ് കോടതിയെ
 B. ഹൈക്കോടതിയെ D. രാഷ്ട്രപതിയെ
75. ഒരു ഇന്ത്യൻ പൗരൻ എന്ന നിലയിൽ നിങ്ങളുടെ ചുമതല എങ്ങനെ നിർവ്വഹിക്കും?
 A. എന്റെ മതം എല്ലായിടത്തും പ്രചരിപ്പിക്കും
 B. സ്വതന്ത്രമായി സഞ്ചരിക്കുകയും അഭിപ്രായപ്രകടനം നടത്തുകയും ചെയ്യും.
 C. അവകാശങ്ങൾ ലംഘിക്കപ്പെടുകയാണെങ്കിൽ നിയമ നടപടികൾ സ്വീകരിക്കും.
 D. സ്വന്തം അവകാശങ്ങളോടൊപ്പം മറ്റുള്ളവരുടെ അവകാശങ്ങളെക്കുറിച്ചും ബോധവാനായിരിക്കും.
76. പതിനെട്ട് വയസ്സ് പൂർത്തിയായ ഒരു ഇന്ത്യൻ പൗരൻ പ്രാഥമിക പൗരാവകാശം എങ്ങനെ വിനിയോഗിക്കും?
 A. തെരഞ്ഞെടുപ്പുകളിൽ വോട്ട് ചെയ്യാൻ എല്ലാ പൗരൻമാരെയും പ്രേരിപ്പിക്കും.
 B. തെരഞ്ഞെടുപ്പുകളിൽ സ്വതന്ത്രമായി വോട്ട് ചെയ്യും.
 C. എല്ലാ തെരഞ്ഞെടുപ്പുകളിലും നിർഭയമായി മത്സരിക്കും.
 D. വോട്ട് ചെയ്യുന്നതോടൊപ്പം തെരഞ്ഞെടുപ്പുകളിൽ മത്സരിക്കുകയും ചെയ്യും.

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77. ഗ്രീഷ്മകാലത്ത് ഒളിമ്പിക്സ് നടത്താൻ അനുയോജ്യമായ ഒരു പ്രദേശം തെരഞ്ഞെടുക്കാൻ ആവശ്യപ്പെട്ടാൽ താഴെ കൊടുത്തവയിൽ ഏതാണ് നിങ്ങൾ നിർദ്ദേശിക്കുക?
- ഭൂമദ്ധ്യരേഖയിൽ നിന്നും $23\frac{1}{2}^\circ$ മുതൽ $66\frac{1}{2}^\circ$ വരെയുള്ള പ്രദേശം.
 - ഭൂമദ്ധ്യരേഖയിൽ നിന്നും $23\frac{1}{2}^\circ$ വരെയുള്ള പ്രദേശം.
 - ഭൂമദ്ധ്യരേഖയിൽ നിന്നും $66\frac{1}{2}^\circ$ മുതൽ 90° വരെയുള്ള പ്രദേശം.
 - ദക്ഷിണ അക്ഷാംശം $23\frac{1}{2}^\circ$ മുതൽ ഉത്തര അക്ഷാംശം $23\frac{1}{2}^\circ$ വരെയുള്ള പ്രദേശം.
78. നിങ്ങളുടെ സ്കൂൾ പ്രദേശത്തെ അന്തരീക്ഷ മർദ്ദം അളന്നപ്പോൾ 73 സെ.മീ. എന്ന് കിട്ടി. ഇതിൽ നിന്നും സ്കൂൾ സമുദ്രനിരപ്പിന് മുകളിലാണോ, താഴെയാണോ സ്ഥിതി ചെയ്യുന്നത് എന്ന് കണ്ടുപിടിക്കാമോ?
- 67 സെന്റിമീറ്ററിന് മുകളിലായതുകൊണ്ട് സമുദ്രനിരപ്പിന് താഴെയാണ്.
 - 67 സെന്റിമീറ്ററിന് മുകളിലായതുകൊണ്ട് സമുദ്രനിരപ്പിന് മുകളിലാണ്.
 - 76 സെന്റിമീറ്ററിന് താഴെയായതുകൊണ്ട് സമുദ്രനിരപ്പിന് താഴെയാണ്.
 - 76 സെന്റിമീറ്ററിന് താഴെയായതുകൊണ്ട് സമുദ്രനിരപ്പിന് മുകളിലാണ്.
79. ഭാവിയിൽ മനുഷ്യരാശിക്ക് സമുദ്രങ്ങളെ കൂടുതലായി ആശ്രയിക്കേണ്ടിവരുമെന്നതിനാൽ അതിനുവേണ്ടി നിങ്ങൾക്കെന്തുചെയ്യാൻ കഴിയും?
- സമുദ്രയുദ്ധങ്ങളിൽ നിന്നും വിട്ടുനിൽക്കൽ.
 - ആഴക്കടൽ മത്സ്യബന്ധനം തടയുക.
 - സമുദ്ര മലിനീകരണം തടയുക.
 - സമുദ്രത്തിലെ എണ്ണപ്പനനം നിരോധിക്കുക.
80. നശീകരണ ഭീഷണി നേരിടുന്ന പവിഴപ്പുറ്റുകളെ സംരക്ഷിക്കാൻ നിങ്ങൾ എന്തു ചെയ്യും?
- ഇത്തരം പ്രദേശങ്ങളിൽ കപ്പലുകൾ പ്രവേശിക്കുന്നത് തടയുക.
 - അന്തർവാഹിനികളുടെ ഉപയോഗം നിരുത്സാഹപ്പെടുത്തുക.
 - മണ്ണൊലിപ്പ് തടയുന്നതിനാവശ്യമായ നടപടികളെടുക്കുക.
 - മത്സ്യബന്ധനം നിരുത്സാഹപ്പെടുത്തുക.
81. വന്യജീവി സമ്പത്തിന്റെ സംരക്ഷണത്തിന് താഴെ പറയുന്നവയിൽ നിങ്ങൾ ഏതുമാർഗ്ഗം സ്വീകരിക്കും.
- വനവൽക്കരണം പ്രോത്സാഹിപ്പിക്കുകയും വനത്തിലേക്കുള്ള അതിക്രമിച്ചു കടക്കൽ ചെറുക്കുകയും ചെയ്യുക.
 - മൃഗശാലകൾ നിർമ്മിക്കുക.
 - വന്യജീവികളെ വിദേശത്തുനിന്നും കൊണ്ടുവരിക.
 - വന്യജീവികളെ വേട്ടയാടുന്നത് പ്രോത്സാഹിപ്പിക്കുക.
82. നിങ്ങളുടെ പഞ്ചായത്തിലെ ഹൈസ്കൂളുകളുടെ വിതരണം സംബന്ധിച്ച് ഒരു രൂപരേഖ ആവശ്യമായാൽ നിങ്ങൾ എന്താണ് തയ്യാറാക്കുക?
- ഒരു ലഘുമാപക ഭൂപടം
 - ഒരു ബൃഹത്മാപക ഭൂപടം.
 - മുഴുവൻ ഹൈസ്കൂളുകളുടേയും ഒരു പട്ടിക.
 - മുഴുവൻ ഹൈസ്കൂളുകളുടേയും ചിത്രങ്ങൾ.
83. നിങ്ങൾ ഏകദേശം അഞ്ച് ഹെക്ടർ ഭൂമിയിൽ തെങ്ങ് കൃഷി ചെയ്യാൻ ആഗ്രഹിക്കുന്നുവെന്ന് കരുതുക. കൃഷിചെയ്യാൻ വേണ്ട ദീർഘകാല സാമ്പത്തിക സഹായത്തിന് എന്തു ചെയ്യും?
- സഹകരണ ബാങ്കുകളിൽ നിന്നും ഹ്രസ്വകാലവായ്പ എടുക്കും.
 - റിസർവ്വ് ബാങ്കിൽ നിന്നും ദീർഘകാല വായ്പ എടുക്കും.
 - ഭൂവികസന ബാങ്കിൽ നിന്നും ദീർഘകാല വായ്പ എടുക്കും.
 - ഇന്ത്യൻ വ്യവസായ വികസന ബാങ്കിൽ നിന്നും ഹ്രസ്വകാലവായ്പ എടുക്കും.
84. നിങ്ങൾ വാങ്ങിയ ഒരു റേഡിയോ ഏതാനും ദിവസങ്ങൾക്കകം പ്രവർത്തിക്കാതായി എന്നു കരുതുക. നഷ്ടം വകവെച്ചു തരുവാൻ വ്യാപാരി തയ്യാറാവുന്നില്ലെങ്കിൽ നിങ്ങൾ എവിടെയാണ് പരാതിപ്പെടുക?
- സംസ്ഥാനതല ഉപഭോക്തൃ സംരക്ഷണ സമിതിയിൽ.
 - ജില്ലാകോടതിയിൽ.
 - ഹൈക്കോടതിയിൽ.
 - ജില്ലാതല ഉപഭോക്തൃ സംരക്ഷണ സമിതിയിൽ.
85. മനുഷ്യൻ പാർത്തിരുന്ന നദീതീരങ്ങളിൽ പലതരത്തിലുള്ള മൃഗങ്ങളെയും കണ്ടിരിക്കാം. അവയിൽ ചില മൃഗങ്ങളെ അവൻ ഇണക്കി വളർത്താൻ തുടങ്ങി. ഇത് സൂചിപ്പിക്കുന്നതെന്ത്?
- മൃഗങ്ങളില്ലാതെ മനുഷ്യന് ജീവിക്കാൻ സാധിക്കില്ല.
 - മനുഷ്യന് എല്ലാ മൃഗങ്ങളെയും ഇഷ്ടമാണ്.
 - മൃഗങ്ങളുടെ സ്വഭാവവിശേഷങ്ങൾ നിരീക്ഷിച്ച് മനസ്സിലാക്കാൻ മനുഷ്യന് കഴിയും.
 - മൃഗങ്ങളെ സംരക്ഷിക്കാൻ മനുഷ്യനേ കഴിയൂ.
86. പുരാതന ഈജിപ്തുകാർക്ക് മുതശരീരങ്ങളിൽ സുഗന്ധദ്രവ്യങ്ങൾ പുശി കേടുകൂടാതെ സംരക്ഷിക്കുന്ന വിദ്യ വശമായിരുന്നു. അന്നന്യദൃശ്യമായ, അവരുടെ ഈ കഴിവിനെ എങ്ങനെ വിശദീകരിക്കാം?
- ഒരു പുതിയ ശാസ്ത്രവിദ്യ അവർ ലോകത്തിന് നൽകി.
 - മനുഷ്യ ശരീരഘടനയിലും ശാസ്ത്രത്തിലും അവർക്ക് മികച്ച പരിജ്ഞാനം ഉണ്ടായിരുന്നു.
 - മുതശരീരങ്ങളെ അവർ ആരാധിച്ചിരുന്നു.
 - മരണാനന്തര ജീവിതത്തിൽ അവർ വിശ്വസിച്ചു.

87. ആദ്യകാല ചൈനയിൽ ബുദ്ധമതത്തിന്റെ സ്വാധീനം ശില്പവിദ്യയിലും ചിത്രകലയിലും കൊത്തുപണിയിലും പ്രതിഫലിച്ചിരുന്നു. ഇത് വെളിപ്പെടുത്തുന്ന വസ്തുത എന്ത്?
- ബുദ്ധമത തത്വങ്ങളെ അവർ ജീവതത്തിന്റെ എല്ലാ മേഖലകളിലും പ്രാവർത്തികമാക്കി.
 - ബുദ്ധനെ പ്രീതിപ്പെടുത്താൻ അവർ ആഗ്രഹിച്ചു.
 - അക്കാലത്ത് ചൈനയിലെ മുഴുവൻ ജനങ്ങളും ബുദ്ധമതവിശ്വാസികളായിരുന്നു.
 - ശില്പകലയുടെയും കൊത്തുപണിയുടെയും വളർച്ച ബുദ്ധമതത്തിന്റെ ലക്ഷ്യമായിരുന്നു.
88. നവോത്ഥാനകാലത്ത് രൂപംകൊണ്ട മാനവതാവാദം മനുഷ്യന്റെ ശക്തിയിലും സിദ്ധിവിശേഷങ്ങളിലും വിശ്വസിക്കുകയും അത് ദിവ്യത്വപരമല്ലെന്ന് വാദിക്കുകയും ചെയ്തു. ഈ വിശ്വാസത്തിന്റെ അന്തസ്സത്ത എന്ത്?
- സ്നേഹവും സാഹോദര്യവും
 - മനുഷ്യമഹത്വത്തിനും മനുഷ്യകേന്ദ്രീകൃത പഠനത്തിനുമുള്ള ഉയർന്ന പരിഗണന.
 - ദൈവത്തേക്കാൾ ശക്തി മനുഷ്യനുണ്ട്.
 - മനുഷ്യന്റെ കഴിവുകളിലുള്ള അന്ധമായ വിശ്വാസം.
89. മർദ്ദ വ്യത്യാസമുള്ള വായു അറകളിൽപ്പെട്ട് അപകടം സംഭവിക്കാതിരിക്കാൻ വിമാനങ്ങൾ മിക്കവാറും ട്രോപ്പോപ്പാസിന് മുകളിലൂടെയാണ് സഞ്ചരിക്കുന്നത്. ഈ ആശയം എന്തർത്ഥമാക്കുന്നു?
- ട്രോപ്പോപ്പാസിൽ കൂടി വിമാനങ്ങൾ ഒരിക്കലും സഞ്ചരിക്കില്ല.
 - ഇതു വഴി സഞ്ചരിക്കുന്ന വിമാനങ്ങൾ പതിവായി അപകടത്തിൽപ്പെടുന്നു.
 - ഇതു വഴി സഞ്ചരിക്കുന്ന വിമാനങ്ങൾ അപകടത്തിൽപ്പെടാനിടയുണ്ട്.
 - ട്രോപ്പോപ്പാസിൽ കൂടി വിമാനങ്ങൾ സഞ്ചരിക്കുമെങ്കിലും അപകടം പതിവാണ്.
90. സ്ക്രാറ്റോസ്ഫിയറിന്റെ താഴെ ഭാഗത്ത് ചൂട് വ്യത്യാസമില്ലാതെ നിലനിൽക്കുകയും ഉപരിഭാഗത്തെ താപനില വർദ്ധിക്കുകയും ചെയ്യുന്നു. എന്നാൽ തെർമോസ്ഫിയറിൽ താപനില ഏതാണ്ട് 700°C വരെ ഉയരാറുണ്ട്. ഇതനുസരിച്ച് ഈ രണ്ട് മേഖലകളിലെയും താപഘടനയിലുള്ള വ്യത്യാസം എന്താണെന്ന് പറയാം?
- രണ്ടിലും താപനില അസ്ഥിരമാണ്.
 - രണ്ടിലെയും താപനിലയിൽ പ്രകടമായ വ്യത്യാസമൊന്നുമില്ല.
 - രണ്ടിലും താപനില ഉയർന്നതാണെങ്കിലും സ്ക്രാറ്റോസ്ഫിയറിന്റെ താഴെ ഭാഗത്ത് താപഘടന സ്ഥിരമല്ല.
 - സ്ക്രാറ്റോസ്ഫിയറിൽ താപനില ആദ്യം സ്ഥിരവും പിന്നീട് ഉയരുകയും ചെയ്യുമ്പോൾ തെർമോസ്ഫിയറിൽ ഇത് ക്രമമായി ഉയരുന്നു.
91. നിരവധി ആവശ്യങ്ങൾക്കായി മനുഷ്യൻ ഭൂമിയെ ഉപയോഗിക്കുമ്പോൾ ഭൂമിയുടെ ആളോഹരി വിഹിതം കുറയുന്നു. ഈ വസ്തുത എന്തിലേക്കാണ് വിരൽ ചൂണ്ടുന്നത്?
- പരിമിതമായ ഭൂമിയെ വളരെ ശ്രദ്ധാപൂർവ്വം ഉപയോഗിക്കേണ്ടതാണ്.
 - കാർഷികേതര ആവശ്യങ്ങൾക്കുള്ള ഭൂമിയുടെ ഉപയോഗം ചുരുക്കേണ്ടതാണ്.
 - കാർഷിക ആവശ്യങ്ങൾക്ക് മാത്രം ഉപയോഗിച്ചാൽ ഭൂമിയുടെ ആളോഹരി വിഹിതം വർദ്ധിപ്പിക്കാൻ കഴിയും.
 - കാർഷിക ആവശ്യങ്ങൾക്കു മാത്രമേ ഭൂമിയെ ഉപയോഗിക്കാവൂ.
92. ലോകത്തിലെ ആണവോർജ്ജ കേന്ദ്രങ്ങളുടെ 70% വും പടിഞ്ഞാറൻ യൂറോപ്പിലും ഐക്യനാടുകളിലും ജപ്പാനിലുമാണ് സ്ഥിതി ചെയ്യുന്നത്. ഇത് സൂചിപ്പിക്കുന്നതെന്ത്?
- ആണവോർജ്ജ കേന്ദ്രങ്ങൾ ഈ രാജ്യങ്ങളുടെ കൂത്തകയാണ്.
 - ആണവോർജ്ജ സാങ്കേതിക ജ്ഞാനവും സൗകര്യങ്ങളും വികസിത രാജ്യങ്ങൾക്ക് കൂടുതലായുണ്ട്.
 - ആണവോർജ്ജ സാങ്കേതിക ജ്ഞാനവും സൗകര്യങ്ങളും വികസിത രാജ്യങ്ങളിൽ മാത്രം ലഭ്യമാണ്.
 - ആണവോർജ്ജ കേന്ദ്രങ്ങളുടെ സ്ഥാപനത്തിന് ഈ രാജ്യങ്ങൾ മാത്രമാണ് അനുയോജ്യമായവ.
93. കേരളത്തിലെ ഗ്രാമപഞ്ചായത്തുകളുടെ പ്രവർത്തനത്തെ എങ്ങനെ വിശദീകരിക്കാം?
- ഗ്രാമങ്ങളുടെ കാർഷിക - വ്യാവസായിക ആവശ്യങ്ങൾ സംരക്ഷിക്കുന്നു.
 - ഗ്രാമീണ ജനതയുടെ ജനാധിപത്യ പൗരാവകാശങ്ങൾ സംരക്ഷിക്കുന്നു.
 - ഗ്രാമങ്ങളിലെ അടിസ്ഥാന ജനാധിപത്യ സ്വയംഭരണ സ്ഥാപനങ്ങളാണ്.
 - ഗ്രാമീണ ജനതയുടെ തൊഴിലില്ലായ്മ പരിഹരിക്കുന്ന സ്വയംഭരണ സ്ഥാപനങ്ങളാണ്.
94. ഇന്ത്യയിൽ ജനങ്ങളുടെ ജീവനും സ്വത്തിനും സംരക്ഷണം നൽകുക എന്നത് സംസ്ഥാന ഗവൺമെന്റുകളുടെ മുഖ്യ ചുമതലയാണെന്നതിന്റെ അടിസ്ഥാനം എന്താണ്?
- പോലീസ് സേനയുടെ മികച്ച ഉപയോഗം സംസ്ഥാന ഗവൺമെന്റുകൾക്ക് മാത്രം സാധ്യമാകുന്നു.
 - ജനങ്ങളുമായി അടുത്ത് ഇടപഴകാൻ കഴിയുമെന്നതിനാൽ ക്രമസമാധാനം സംസ്ഥാന ഗവൺമെന്റുകൾ നിർവ്വഹിക്കേണ്ടതാണ്.
 - ഇന്ത്യയിൽ പോലീസ് സേനകൾ സംസ്ഥാന ഗവൺമെന്റുകൾക്ക് മാത്രമുള്ളതാണ്.
 - ഭരണഘടന അനുസരിച്ച് ക്രമസമാധാനപാലന ചുമതല സംസ്ഥാന ഗവൺമെന്റുകൾക്കാണ്.

95. പല വികസ്വര രാജ്യങ്ങളിലും മരക്കലപ്പയും കാളയും ഉപയോഗിച്ചാണ് നിലമുഴുനുന്നത്. എന്നാൽ വികസിത രാജ്യങ്ങളിൽ ആധുനിക യന്ത്രങ്ങളും ഉപകരണങ്ങളുമാണ് ഉപയോഗിക്കുന്നത്. ഈ വ്യത്യാസത്തെ എങ്ങനെ വിശദീകരിക്കാം?
- വികസ്വര രാജ്യങ്ങളിൽ പഴക്കം ചെന്ന ഉൽപ്പാദനരീതികളും ഉപകരണങ്ങളുമാണ് ഉപയോഗിക്കുന്നത്.
 - വികസിത രാജ്യങ്ങളിൽ എല്ലാ ഉൽപ്പാദന പ്രവർത്തനങ്ങളിലും യന്ത്രങ്ങൾ അത്യാവശ്യമാണ്.
 - വികസ്വര രാജ്യങ്ങളിലെ ഉൽപ്പാദന പ്രവർത്തനങ്ങളിൽ ആധുനിക യന്ത്രങ്ങളും ഉപകരണങ്ങളും ആവശ്യമില്ല. D. വികസിത രാജ്യങ്ങളിൽ ആധുനിക യന്ത്രസാമഗ്രികൾ ഉപയോഗിക്കുന്നു എന്നതുകൊണ്ടാണ് വ്യത്യാസം.
96. ആസൂത്രണക്കമ്മീഷൻ രാജ്യത്തിന്റെ ദേശീയവരുമാനത്തെ സ്വാധീനിക്കുന്ന ഘടകങ്ങളെക്കുറിച്ച് പഠിക്കുന്നു. ഇതുകൊണ്ട് എന്താണ് ഉദ്ദേശിക്കുന്നത് ?
- ദേശീയ വരുമാനത്തെ അടിസ്ഥാനമാക്കിയുള്ള പദ്ധതികൾ ആസൂത്രണം ചെയ്യുക.
 - ദേശീയ വരുമാനം നിർണ്ണയിക്കുന്നതിൽ പഞ്ചവത്സര പദ്ധതികളുടെ പങ്ക് കണ്ടെത്തുക.
 - ദേശീയ വരുമാനം വർദ്ധിപ്പിക്കത്തക്കവണ്ണം പദ്ധതികൾ ആസൂത്രണം ചെയ്യുക.
 - ദേശീയ വരുമാനവും സാമ്പത്തിക വളർച്ചയും തമ്മിലുള്ള പരസ്പര ബന്ധം കണ്ടെത്തുക.
97. സിന്ധു നദീതട സംസ്കാരത്തിന്റെ അവശിഷ്ടങ്ങൾ ഹാരപ്പ, മോഹഞ്ചദാരോ, പഞ്ചാബിലെ രൂപാർ, രാജസ്ഥാനിലെ കാലിബങ്കൻ, ഗുജറാത്തിലെ ലോത്തൽ, ഹരയാനയിലെ ബനാവലി എന്നിവിടങ്ങളിൽ നിന്നാണ് കണ്ടു കിട്ടിയത്. ഇതിൽ നിന്നും നിങ്ങൾക്ക് എന്ത് കണ്ടെത്താൻ കഴിയും?
- ഈ സംസ്കാരം ഒരു വിശാലമായ പ്രദേശത്ത് വ്യാപിച്ച് കിടന്നതും ഭാരത സംസ്കാരത്തിന് അടിസ്ഥാന പാകിയതുമാണ്.
 - ഇത് മറ്റ് സംസ്കാരങ്ങളേക്കാൾ പുരോഗമിച്ചതും വളരെ നാൾ നിലനിന്നതുമായിരുന്നു.
 - ഇത് നിരവധി സ്ഥലങ്ങളിലായി വെവ്വേറെ നിലവിൽ വന്ന സംസ്കാരമായിരുന്നു.
 - ഇവിടുത്തെ ജനങ്ങളെ ശത്രുക്കൾ നിരന്തരം ആക്രമിച്ചതിനാൽ സംസ്കാരം അധഃപതിച്ചു.
98. പ്രകൃതി ശക്തികളിൽ വിശ്വസിച്ചിരുന്ന ആര്യന്മാർ ഇന്ദ്രൻ, വരുണൻ, സൂര്യൻ തുടങ്ങിയ ദേവൻ മാത്രമേ ആരാധിച്ചിരുന്നു. ഇതിൽ നിന്നും നിങ്ങൾ കണ്ടെത്തുന്ന വസ്തുതയെന്ത് ?
- പ്രകൃതി ശക്തികളെ മാത്രമാണ് ആര്യന്മാർ ആരാധിച്ചിരുന്നത്
 - ഇന്ദ്രൻ, വരുണൻ, സൂര്യൻ എന്നിവ മാത്രമാണ് പ്രകൃതി ശക്തികൾ
 - പ്രകൃതി ശക്തികൾക്കായി ആര്യന്മാർ നിരവധി ക്ഷേത്രങ്ങൾ പണികഴിപ്പിച്ചു.
 - ആര്യന്മാർ ബഹുദൈവ വിശ്വാസികൾ ആയിരുന്നു.
99. പ്രസിദ്ധ ജ്യോതിശാസ്ത്ര പണ്ഡിതരായിരുന്ന വരാഹമിഹിരനും ആര്യഭട്ടീയത്തിന്റെ കർത്താവായ ആര്യഭട്ടനും ഗുപ്തന്മാരുടെ കാലത്താണ് ജീവിച്ചിരുന്നത്. ഇതിൽ നിന്നും നിങ്ങൾ കണ്ടെത്തുന്ന ആശയമെന്ത്?
- ജ്യോതിശാസ്ത്ര രംഗത്തെ അടിസ്ഥാന ഗ്രന്ഥമാണ് ആര്യഭട്ടീയം.
 - പ്രശസ്ത ജ്യോതിശാസ്ത്രജ്ഞർ ജീവിച്ചിരുന്നത് പൗരാണിക ഇന്ത്യയിൽ മാത്രമാണ്.
 - പൗരാണിക ഇന്ത്യയിൽ ജ്യോതിശാസ്ത്ര രംഗത്ത് ഗഹനമായ പഠനങ്ങൾ നടന്നിട്ടുണ്ട്.
 - പൗരാണിക ഇന്ത്യയിൽ ജ്യോതിശാസ്ത്ര രംഗത്ത് മാത്രമാണ് മികച്ച നേട്ടങ്ങൾ ഉണ്ടായത്.
100. പുരാതന ഇന്ത്യയിലെ ജനങ്ങൾക്ക് ഇഷ്ടമുള്ള മതത്തിൽ വിശ്വസിക്കാൻ അവകാശമുണ്ടായിരുന്നു. അവർ ദയ, വിനയം, ആതിഥ്യമര്യാദ തുടങ്ങിയ സദ്ഗുണങ്ങൾ ഉള്ളവരുമായിരുന്നു. ഇതിൽ നിന്നും നിങ്ങൾ എന്ത് കണ്ടെത്തുന്നു?
- പുരാതന ഇന്ത്യയിൽ മതസൗഹാർദ്ദം നിർബന്ധമായിരുന്നു.
 - ഉന്നത മാനവ മൂല്യങ്ങൾ എക്കാലത്തും ഇന്ത്യയിൽ ആദരിക്കപ്പെട്ടിരുന്നു.
 - അക്കാലത്ത് രാജാക്കന്മാർ ജനങ്ങളുടെ പൗരാവകാശങ്ങൾ അംഗീകരിച്ചിരുന്നു.
 - ജനങ്ങൾക്ക് സദ്ഗുണങ്ങൾ ഉണ്ടായിരുന്നതിനാൽ മതസ്വാതന്ത്ര്യം അനുവദിച്ചിരുന്നു.
101. ഭൗമോപരിതലത്തിൽ 71 ശതമാനത്തോളം മൂടപ്പെട്ടിരിക്കുന്ന ജലം ധ്രുവപ്രദേശങ്ങളിൽ മഞ്ഞുകട്ടയായും അന്തരീക്ഷത്തിൽ നീരാവിയായും ജലാശയങ്ങളിൽ ദ്രാവകരൂപത്തിലും കാണപ്പെടുന്നു. ഇതിൽ നിന്നും നിങ്ങൾ കണ്ടെത്തുന്ന വസ്തുതയെന്ത്?
- ജലത്തിന് ഖരം, ദ്രവം, വാതകം എന്നീ മൂന്നവസ്ഥകളിലും സ്ഥിതിചെയ്യാൻ കഴിയും.
 - ജലം മൂന്നവസ്ഥകളിലും കാണപ്പെടുന്നതുകൊണ്ടാണ് ജീവജാലങ്ങൾ നിലനിൽക്കുന്നത്.
 - ഭൗമോപരിതലത്തിലെ ജലത്തിന്റെ അളവ് 71 % ആയതിനാൽ അത് മൂന്നവസ്ഥകളിൽ സ്ഥിതിചെയ്യുന്നു.
 - ജലത്തിന് മൂന്ന് അവസ്ഥകളിൽ സ്ഥിതി ചെയ്യാൻ കഴിയുന്നതുകൊണ്ട് ഭൗമോപരിതലത്തിൽ അതിന്റെ അളവ് 71 % ആണ്.

102. താപനില ഏതാണ്ട് 700°C വരെ ഉയരാറുള്ള തെർമോസ്ഫിയറിൽ കൂടി റോക്കറ്റുകളും കൃത്രിമോപഗ്രഹങ്ങളും കടന്നുപോകുന്നു എന്നതിൽ നിന്നും നിങ്ങൾ എന്തു നിഗമനത്തിൽ എത്തിച്ചേരുന്നു?
- ഈ മേഖലയിലെ ഉന്നത ഊഷ്മാവ് അവയെ ബാധിക്കുന്നില്ല.
 - ഈ മേഖലയിൽ കൂടി കടന്നു പോകുന്ന റോക്കറ്റുകൾക്കും കൃത്രിമോപഗ്രഹങ്ങൾക്കും താപപ്രതിരോധ സജ്ജീകരണങ്ങൾ ആവശ്യമാണ്.
 - റോക്കറ്റുകളും കൃത്രിമോപഗ്രഹങ്ങളും അതിവേഗതയിൽ സഞ്ചരിക്കുന്നതിനാൽ ഉയർന്ന ഊഷ്മാവിനെ ചെറുക്കുന്നു.
 - ഈ മേഖലയിലെ ഊഷ്മാവ് കുറയുന്ന സമയം നോക്കിയാണ് റോക്കറ്റുകളും കൃത്രിമോപഗ്രഹങ്ങളും വിക്ഷേപിക്കുന്നത്.
103. ധ്രുവപ്രദേശങ്ങളിൽ ലഭിക്കുന്ന സൂര്യതാപത്തിന്റെ അളവ് വളരെ കുറവായതിനാൽ ഉത്തര-ദക്ഷിണ ധ്രുവങ്ങൾ രണ്ട് ഉച്ച മർദ്ദമേഖലകളായി നിലനിൽക്കുന്നു. ഇതിൽനിന്നും എന്ത് വസ്തുത കണ്ടെത്താൻ കഴിയും?
- ധ്രുവപ്രദേശങ്ങളിലെ ഉച്ചമർദ്ദത്തിനു കാരണം ഉയർന്ന സൂര്യതാപമാണ്.
 - ഊഷ്മാവ് കുറയുമ്പോൾ മർദ്ദം കുറയുന്നു.
 - ഊഷ്മാവ് കുറയുമ്പോൾ മർദ്ദം വർദ്ധിക്കുന്നു.
 - ഊഷ്മാവും മർദ്ദവും പരസ്പരം ബന്ധപ്പെട്ടിരിക്കുന്നത് ധ്രുവപ്രദേശങ്ങളിൽ മാത്രമാണ്.
104. വായുവിലെ ഊർപ്പം ബാഷ്പീകരണത്തെ സ്വാധീനിക്കുന്നു. ഊർപ്പ രഹിത വായുവിന് കൂടുതൽ നീരാവിയെ ഉൾക്കൊള്ളാൻ കഴിയും. ഇതിൽനിന്നും ബാഷ്പീകരണത്തോടുമായി ബന്ധപ്പെട്ട എന്താശയമാണ് നിങ്ങൾക്ക് കിട്ടുന്നത്?
- പീഠഭൂമികളിൽ ഇത് മരുപ്രദേശങ്ങളേക്കാൾ കൂടുതലാണ്.
 - തീരപ്രദേശങ്ങളേക്കാൾ ഇത് മരുപ്രദേശങ്ങളിൽ കുറവാണ്.
 - മരുപ്രദേശങ്ങളേക്കാൾ ഇത് കൂടുതൽ ധ്രുവപ്രദേശങ്ങളിലാണ്.
 - ധ്രുവപ്രദേശങ്ങളേക്കാൾ ഇത് കൂടുതൽ മരുപ്രദേശങ്ങളിലാണ്.
105. നിയമങ്ങളുടെ ഭരണഘടനാ സാധുത പരിശോധിക്കുന്നതിനും മൗലികാവകാശ സംരക്ഷണത്തിനാവശ്യമായ ഉത്തരവുകൾ പുറപ്പെടുവിക്കുന്നതിനും സുപ്രീം കോടതിക്ക് അധികാരമുണ്ട്. ഇതിൽ നിന്നും നിങ്ങൾക്ക് എന്ത് കണ്ടെത്താൻ കഴിയും?
- മൗലികാവകാശ ലംഘനം ഉണ്ടായാൽ പൗരൻമാർ സുപ്രീം കോടതിയെയാണ് സമീപിക്കേണ്ടത്.
 - നിയമനിർമ്മാണം നടത്തുമ്പോൾ ഗവൺമെന്റ് സുപ്രീം കോടതിയുമായി ആലോചിക്കേണ്ടതാണ്.
 - ഈ അധികാരങ്ങൾ സുപ്രീം കോടതിക്ക് മാത്രമാണ് ഉള്ളത്.
 - ഇന്ത്യൻ ഭരണഘടനയുടേയും പൗരാവകാശങ്ങളുടേയും സംരക്ഷകനാകാൻ സുപ്രീം കോടതിക്ക് കഴിയും.
106. ഇന്ത്യൻ പ്രസിഡന്റ് തന്റെ അധികാരങ്ങൾ വിനിയോഗിക്കുന്നത് പ്രധാനമന്ത്രിയുടെയും മന്ത്രിസഭയുടെയും ഉപദേശമനുസരിച്ചാണ്. ഇതിൽ നിന്നും നിങ്ങൾ എന്ത് നിഗമനത്തിൽ എത്തിച്ചേരുന്നു?
- പ്രസിഡന്റ് പരമാധികാരിയാണെങ്കിലും നിർവ്വഹണാധികാരമില്ല.
 - സ്വന്തം നിലയിൽ പ്രവർത്തിച്ചാൽ പ്രസിഡന്റിനെ ഇംപീച്ച് ചെയ്യും.
 - പ്രസിഡന്റിന്റെ അധികാരങ്ങൾ ഇന്ത്യൻ ഭരണഘടനയാൽ നിയന്ത്രിക്കപ്പെട്ടിരിക്കുന്നു.
 - പ്രസിഡന്റ് സ്വന്തം നിലയിൽ പ്രവർത്തിച്ചാൽ ഭരണഘടനാ പ്രതിസന്ധിയുണ്ടാകും.
107. മുതലാളിത്ത സമ്പദ് വ്യവസ്ഥയുടെ പ്രധാന ന്യൂനതകളാണ് ലാഭോരോടെുള്ള പ്രവർത്തനങ്ങൾ, കിടമത്സരങ്ങൾ കൊണ്ടുള്ള പാഴ്ചെലവ്, സ്വകാര്യസ്വത്തിനുള്ള പ്രാമുഖ്യം തുടങ്ങിയവ. ഇതിൽനിന്നും നിങ്ങൾ കണ്ടെത്തുന്ന വസ്തുതയെന്ത്?
- ഇന്ത്യ പോലുള്ള ഒരു വികസന രാജ്യത്തിന് ഏറ്റവും അനുയോജ്യം മുതലാളിത്തമാണ്.
 - ഇന്ത്യ പോലുള്ള ഒരു വികസന രാജ്യത്തിന് ഏറ്റവും അനുയോജ്യം ഒരു മിശ്രസമ്പദ് വ്യവസ്ഥയാണ്.
 - ഉയർന്ന സാമ്പത്തിക വളർച്ച നേടാൻ ഇന്ത്യക്ക് ഏറ്റവും ഉചിതം മുതലാളിത്ത വ്യവസ്ഥിതിയാണ്.
 - ഇന്ത്യയിലെ ദാരിദ്ര്യവും തൊഴിലില്ലായ്മയും പരിഹരിക്കാൻ മുതലാളിത്ത വ്യവസ്ഥിതി ആവശ്യമാണ്.
108. വിഭവങ്ങളുടെ അപര്യാപ്തമായ വിനിയോഗം, മൂലധനത്തിന്റെ അഭാവം, ഉയർന്ന ജനസംഖ്യ വളർച്ചാ നിരക്ക് തുടങ്ങിയവ ഇന്ത്യൻ സമ്പദ് വ്യവസ്ഥയുടെ ലക്ഷണങ്ങളാണ്. ഇത് ഏത് തരം സമ്പദ് വ്യവസ്ഥയ്ക്ക് ഉദാഹരണമാണ് ?
- വികസന സമ്പദ് വ്യവസ്ഥ.
 - മുതലാളിത്ത സമ്പദ് വ്യവസ്ഥ.
 - വികസിത സമ്പദ് വ്യവസ്ഥ.
 - മിശ്രസമ്പദ് വ്യവസ്ഥ.

109. ഈജിപ്തിലെ സംസ്കാരത്തെക്കാൾ സിന്ധുനദീതട സംസ്കാരമാണ് ആഴത്തിൽ വേരുന്നിയത് എന്ന് നിങ്ങൾ വിലയിരുത്തുന്നുവെങ്കിൽ അതിനടിസ്ഥാനമെന്ത് ?
- ആധുനിക ഭാരത സംസ്കാരത്തിന് അടിത്തറപാകാൻ സിന്ധുനദീതട സംസ്കാരത്തിന് സാധിച്ചു.
 - സിന്ധുനദീതടത്തിലെ ജനങ്ങൾ ഈജിപ്തിലെ ജനങ്ങളെക്കാൾ മികച്ച നഗരാസൂത്രണം നടത്തി.
 - ഈ സംസ്കാരം ഈജിപ്ത് സംസ്കാരത്തെക്കാൾ കൂടുതൽകാലം നിലനിന്നു.
 - ഗ്രേറ്റ് ബാത്തിന്റെ അവശിഷ്ടങ്ങൾ കണ്ടെത്തിയിരിക്കുന്നത് സിന്ധുനദീതടത്തിൽ മാത്രമാണ്.
110. ജപ്പാനിൽ കർഷകരുടെമേൽ കനത്ത നികുതി ചുമത്തിയപ്പോൾ കൃഷിക്കാർ ഭൂമി തരിശിട്ടു. അതുകൊണ്ട് ഗവൺമെന്റ് ഭൂമി പുനർവിഭജനം ചെയ്ത് 'സുമറായ്' എന്നറിയപ്പെടുന്ന യോദ്ധാക്കൾക്ക് നൽകി. ഈ നടപടിയെ നിങ്ങൾ എങ്ങനെ വിലയിരുത്തുന്നു ?
- ഗവൺമെന്റിന് ഇതല്ലാതെ മറ്റ് മാർഗ്ഗമില്ല.
 - കാർഷിക മേഖലയിലെ യഥാർത്ഥ ഉൽപാദകരായ കർഷകരെ ദ്രോഹിക്കുന്നതാണ് ഈ നടപടി.
 - കർഷകർ ഉൽപാദനം വർദ്ധിപ്പിച്ച് നികുതി കൃത്യമായി അടക്കണമായിരുന്നു.
 - കർഷകർക്ക് ഇത് ദ്രോഹകരമാണെങ്കിലും സുമറായിമാർക്ക് ഗുണകരമാണ്.
111. മതനവീകരണ കാലഘട്ടത്തിൽ കൃസ്തുമതസഭ മതനിഷേധത്തിനുള്ള ശിക്ഷകൾ നിർബന്ധമാക്കുകയും സഭാനിയമങ്ങൾ അനുസരിക്കാത്തവരെ മതഭ്രഷ്ടരാക്കുകയും ചെയ്തു. പോപ്പിന്റെ ഈ പ്രവർത്തിയെ നിങ്ങൾ എങ്ങനെ വിലയിരുത്തുന്നു ?
- പോപ്പ് തന്റെ ചുമതലകൾ കൃത്യമായി നിർവ്വഹിക്കുന്നതിൽ വിജയിച്ചു.
 - പോപ്പിന്റെ ഈ നടപടികൾ അത്യാവശ്യമാണെങ്കിലും ഒഴിവാക്കാനായിരുന്നു.
 - ഈ നടപടികൾ കൃസ്തുമതസഭയുടെ ഐക്യത്തിന് ചേർന്നതായിരുന്നില്ല.
 - ആ കാലഘട്ടത്തിൽ ഈ നടപടികൾ ആവശ്യവും ഒഴിവാക്കാനാവാത്തതുമായിരുന്നു.
112. നിരക്ഷരരും അന്ധവിശ്വാസികളുമായിരുന്ന അറബികളെ പ്രവാചകനായ മുഹമ്മദ് നബി അറിവു നേടാൻ പ്രേരിപ്പിക്കുകയും സദ്ഗുണങ്ങൾ പഠിപ്പിക്കുകയും ചെയ്തു. നബിയുടെ ഈ പ്രവർത്തികളെ നിങ്ങൾ എങ്ങനെ വീക്ഷിക്കുന്നു ?
- അറബികളെ ഒരു പ്രമുഖ സൈനിക ശക്തിയാക്കാൻ നബിക്ക് സാധിച്ചു.
 - പരിഷ്കാരമുണ്ടാക്കാൻ സാധിച്ചെങ്കിലും അറബികളിൽ ഐക്യമുണ്ടാക്കാൻ സാധിച്ചില്ല.
 - അറബികളിൽ പരിഷ്കാരവും ഐക്യവുമുണ്ടാക്കാൻ നബിക്ക് സാധിച്ചു.
 - അറേബ്യയിൽ നിരവധി വിദ്യാഭ്യാസസ്ഥാപനങ്ങളും അനാഥ മന്ദിരങ്ങളും സ്ഥാപിക്കാനിടയായി.
113. മുതലാളിത്തത്തിന്റെയും സോഷ്യലിസത്തിന്റെയും സവിശേഷതകൾ ഉൾക്കൊള്ളുന്ന ഒരു മിശ്രസമ്പദ് വ്യവസ്ഥയാണ് ഇന്ത്യ പിൻതുടരുന്നത്. ഇന്ത്യൻ സമ്പദ്വ്യവസ്ഥയുടെ പ്രവർത്തനത്തെ നിങ്ങൾ വീക്ഷിക്കുന്നു?
- ഗവൺമെന്റിന്റെ താല്പര്യങ്ങൾക്കനുസരിച്ച് സ്വകാര്യവ്യക്തികളും സ്ഥാപനങ്ങളും പ്രവർത്തിക്കുന്നു.
 - പൊതുജന താല്പര്യം സംരക്ഷിക്കുന്നതിനായി സ്വകാര്യവ്യക്തികളും സ്ഥാപനങ്ങളും പ്രവർത്തിക്കുന്നു.
 - സ്വകാര്യവ്യക്തികളുടേയും സ്ഥാപനങ്ങളുടേയും താല്പര്യങ്ങൾക്കനുസൃതമായി ഗവൺമെന്റ് പ്രവർത്തിക്കുന്നു.
 - സ്വകാര്യവ്യക്തികളോടും സ്ഥാപനങ്ങളോടുമൊപ്പം ഗവൺമെന്റും സാമ്പത്തിക പ്രവർത്തനങ്ങളിൽ ഏർപ്പെടുന്നു.
114. ലോകത്തിന്റെ ആകെ വിസ്തൃതിയുടെ 2.4% മാത്രമുള്ള ഇന്ത്യ ലോകജനസംഖ്യയുടെ 16% ന്റെ ഉൾക്കൊള്ളുന്നു. ജനസംഖ്യാപ്പെരുപ്പം ഇന്ത്യൻ സമ്പദ് വ്യവസ്ഥയിൽ ചെലുത്തുന്ന സ്വാധീനത്തെ നിങ്ങൾ എങ്ങനെ കാണുന്നു ?
- ഇന്ത്യയെപ്പോലുള്ള ഒരു വികസ്വര രാജ്യത്ത് സാമ്പത്തിക വളർച്ച മന്ദീഭവിക്കുന്നു.
 - ആദ്യഘട്ടത്തിൽ സാമ്പത്തിക വളർച്ച മന്ദീഭവിക്കുമെങ്കിലും പിന്നീട് വർദ്ധിക്കുന്നു.
 - വർദ്ധിപ്പിച്ച മനുഷ്യവിഭവശേഷി ഉപയോഗിച്ച് ഉയർന്ന വളർച്ചാനിരക്ക് നേടിയെടുക്കാൻ കഴിയും.
 - മികച്ച അടിസ്ഥാന സൗകര്യങ്ങൾ ഉള്ളതിനാൽ സാമ്പത്തിക വളർച്ചയെ ബാധിക്കുന്നില്ല.
115. പ്രകൃതി വിഭവങ്ങളുടെ അമിതമായ ഉപഭോഗം പരിസ്ഥിതിയുടെ സന്തുലിതാവസ്ഥയെ തകിടം മറിക്കാനിടയാക്കുന്നു. ഈ പ്രശ്നം പരിഹരിക്കുന്നതിന് ഉചിതമായ മാർഗ്ഗം എന്താണെന്ന് നിങ്ങൾ കരുതുന്നു ?
- ഐക്യരാഷ്ട്ര സംഘടനയിൽ ഈ പ്രശ്നം ചർച്ചചെയ്ത് പരിഹാരം കാണുക.
 - ലോകരാഷ്ട്രങ്ങൾ നിയമനിർമ്മാണം നടത്തി വിഭവങ്ങൾ സംരക്ഷിക്കുക.
 - വിഭവസംരക്ഷണമാർഗ്ഗങ്ങൾ കണ്ടെത്തുന്നതിന് ഒരു വിദഗ്ദ്ധസംഘം രൂപീകരിക്കുക.
 - വിഭവങ്ങളുടെ ശാസ്ത്രീയവും ശ്രദ്ധാപൂർവ്വവുമായ ഉപഭോഗത്തിന് ലോകജനതയെ ബോധവൽക്കരിക്കുക.

116. ആധുനിക കാലത്തെ വിവിധ മനുഷ്യപ്രവർത്തനങ്ങളുടെ ഫലമായി സമുദ്ര മലിനീകരണം രൂക്ഷമായിരിക്കുന്നു. ഇതിനെ നിങ്ങൾ എങ്ങനെ വീക്ഷിക്കുന്നു?
- A. സമുദ്രമലിനീകരണം തടയാൻ സാധിക്കില്ലെങ്കിലും അത് കുറയ്ക്കാൻ ശ്രമിക്കേണ്ടതാണ്.
 - B. സമുദ്രമലിനീകരണം സാധാരണമാണെങ്കിലും അത് പരിസ്ഥിതിക്ക് ഹാനികരമാകരുത്.
 - C. എല്ലാവിധ മനുഷ്യപ്രവർത്തനങ്ങളിലും സമുദ്രമലിനീകരണം ഒഴിവാക്കാൻ ശ്രമിക്കേണ്ടതാണ്.
 - D. സമുദ്രമലിനീകരണം ഒഴിവാക്കാനാകാത്തതിനാൽ അത് തടയാനുള്ള ശ്രമം നിഷ്ഫലമാണ്.
117. ഒരു ആവാസവ്യവസ്ഥയിൽ ജീവിയ വിഭാഗത്തോടൊപ്പം അജീവീയ വസ്തുക്കളും ഉൾപ്പെടുന്നു. ഇതിന്റെ അടിസ്ഥാനത്തിൽ ഒരു ആവാസവ്യവസ്ഥയുടെ പ്രവർത്തനം വിലയിരുത്തുക.
- A. ജീവിയ വിഭാഗം സ്വയംസഹായ സമുദായങ്ങളാവുകയാണെങ്കിൽ അജീവീയ ഘടകങ്ങളെ ആശ്രയിക്കേണ്ടതില്ല.
 - B. ജീവിയ വിഭാഗം സ്വയംസഹായ സമുദായങ്ങളാകുന്നതോടൊപ്പം അജീവീയ ഘടകങ്ങളെ ആശ്രയിക്കുന്നു.
 - C. ജീവിയ വിഭാഗത്തിന് ആഹാരത്തിന്റെ കാര്യത്തിലൊഴികെ അജീവീയ ഘടകങ്ങളെ ആശ്രയിക്കേണ്ടതില്ല.
 - D. അജീവീയ ഘടകങ്ങൾക്ക് ജീവിയ വിഭാഗത്തേക്കാൾ പ്രധാന്യം കുറവാണ്.
118. ഓസോൺ സുഷിരത്തിലൂടെ കടന്നുവരുന്ന അൾട്രാവയലറ്റ് രശ്മികൾ മനുഷ്യരാശിക്ക് അത്യന്തം വിനാശകാരികളാണ്. ഈ പ്രശ്നത്തിൽ എന്തു പരിഹാരമാണ് നിങ്ങൾക്ക് നിർദ്ദേശിക്കാനുള്ളത്?
- A. ഓസോൺ സുഷിരത്തിന്റെ കാരണങ്ങൾ ഇല്ലാതാക്കാൻ ജനങ്ങളെ ബോധവൽക്കരിക്കുക.
 - B. ലോകരാഷ്ട്രങ്ങൾ നിയമനിർമ്മാണം നടത്തി ഇത് തടയുക
 - C. അൾട്രാവയലറ്റ് രശ്മികൾ സൃഷ്ടിക്കുന്ന മാരകഫലങ്ങളെ ചെറുക്കുക.
 - D. ഓസോൺ സുഷിരം സൃഷ്ടിക്കുന്ന മാരകഫലങ്ങളെക്കുറിച്ച് ജനങ്ങളെ ബോധ്യപ്പെടുത്തുക.
119. ഇന്ത്യയിലെ ഭൂരിഭാഗം ജനങ്ങളും അധിവസിക്കുന്ന ഗ്രാമങ്ങളുടെ അഭിവൃദ്ധിക്ക് തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങളെ ഫലപ്രദമായി പ്രയോജനപ്പെടുത്തണം എന്ന് ഗാന്ധിജി അഭിപ്രായപ്പെട്ടു. ഗാന്ധിജിയുടെ ഈ വാദഗതി നിങ്ങൾ എങ്ങനെ വിലയിരുത്തുന്നു?
- A. തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങൾ ഇല്ലെങ്കിൽ ഗ്രാമങ്ങൾക്ക് അഭിവൃദ്ധി ഉണ്ടാകില്ല എന്ന് ഗാന്ധിജി വിശ്വസിച്ചു .
 - B. ഇന്ത്യൻ ഗ്രാമങ്ങളെ അടുത്തറിഞ്ഞ ഗാന്ധിജിയുടെ പ്രായോഗിക ബുദ്ധിയാണ് ഇത് കാണിക്കുന്നത്.
 - C. ഗ്രാമീണ ജനതയിൽ ജനാധിപത്യബോധം ഉണ്ടാക്കാൻ ഇത് ആവശ്യമാണെന്ന് ഗാന്ധിജി കരുതി.
 - D. ഇന്ത്യൻ ജനാധിപത്യത്തിന്റെ അടിത്തറ തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങളിലാണ് എന്ന് ഗാന്ധിജി വിശ്വസിച്ചു.
120. ഇന്ത്യയിൽ രാജ്യരക്ഷ, റെയിൽവെ, അണുശക്തി തുടങ്ങിയവ കേന്ദ്രഗവൺമെന്റിന്റെയും ക്രമസമാധാനം, കൃഷി, പൊതുജനാരോഗ്യം തുടങ്ങിയവ സംസ്ഥാനഗവൺമെന്റുകളുടെയും അധികാര പരിധിയിൽ വരുന്നു. ഇത്തരത്തിലുള്ള അധികാരം പങ്കുവെക്കലിനെ നിങ്ങൾ എങ്ങനെ വീക്ഷിക്കുന്നു?
- A. ഇന്ത്യപോലുള്ള ഒരു വിശാലമായ രാജ്യത്ത് അധികാരങ്ങൾ പങ്കുവെക്കുന്ന ഫെഡറൽ സമ്പ്രദായം ഫലപ്രദമാണ്.
 - B. ഇന്ത്യയിൽ ഫെഡറൽ സമ്പ്രദായം പ്രയോജനകരമാണെങ്കിലും അധികാരങ്ങൾ പങ്കുവെക്കുന്നത് ഫലപ്രദമല്ല.
 - C. ദേശീയ ഐക്യത്തിനുവേണ്ടി എല്ലാ പ്രധാന അധികാരങ്ങളും കേന്ദ്രഗവൺമെന്റിൽ കേന്ദ്രീകരിക്കുന്നതാണ് ഉചിതം.
 - D. പ്രാദേശിക സ്വയംഭരണം സാധ്യമാക്കാൻ എല്ലാ പ്രധാന അധികാരങ്ങളും സംസ്ഥാനങ്ങൾക്ക് നൽകേണ്ടതാണ്.

Appendix - V A

UNIVERSITY OF CALICUT

DEPARTMENT OF EDUCATION

Achievement Test in Social Sciences For Secondary School Pupils (Draft)

RESPONSE SHEET

വിദ്യാർത്ഥിയുടെ പേര്

വയസ്സ്.....

ക്ലാസ്.....

ക്ലാസ് നമ്പർ.....

ആൺകുട്ടി/പെൺകുട്ടി

നമ്പർ		നമ്പർ		നമ്പർ		നമ്പർ	
1	A B C D	31	A B C D	61	A B C D	91	A B C D
2	A B C D	32	A B C D	62	A B C D	92	A B C D
3	A B C D	33	A B C D	63	A B C D	93	A B C D
4	A B C D	34	A B C D	64	A B C D	94	A B C D
5	A B C D	35	A B C D	65	A B C D	95	A B C D
6	A B C D	36	A B C D	66	A B C D	96	A B C D
7	A B C D	37	A B C D	67	A B C D	97	A B C D
8	A B C D	38	A B C D	68	A B C D	98	A B C D
9	A B C D	39	A B C D	69	A B C D	99	A B C D
10	A B C D	40	A B C D	70	A B C D	100	A B C D
11	A B C D	41	A B C D	71	A B C D	101	A B C D
12	A B C D	42	A B C D	72	A B C D	102	A B C D
13	A B C D	43	A B C D	73	A B C D	103	A B C D
14	A B C D	44	A B C D	74	A B C D	104	A B C D
15	A B C D	45	A B C D	75	A B C D	105	A B C D
16	A B C D	46	A B C D	76	A B C D	106	A B C D
17	A B C D	47	A B C D	77	A B C D	107	A B C D
18	A B C D	48	A B C D	78	A B C D	108	A B C D
19	A B C D	49	A B C D	79	A B C D	109	A B C D
20	A B C D	50	A B C D	80	A B C D	110	A B C D
21	A B C D	51	A B C D	81	A B C D	111	A B C D
22	A B C D	52	A B C D	82	A B C D	112	A B C D
23	A B C D	53	A B C D	83	A B C D	113	A B C D
24	A B C D	54	A B C D	84	A B C D	114	A B C D
25	A B C D	55	A B C D	85	A B C D	115	A B C D
26	A B C D	56	A B C D	86	A B C D	116	A B C D
27	A B C D	57	A B C D	87	A B C D	117	A B C D
28	A B C D	58	A B C D	88	A B C D	118	A B C D
29	A B C D	59	A B C D	89	A B C D	119	A B C D
30	A B C D	60	A B C D	90	A B C D	120	A B C D

Appendix V.B

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

Achievement Test in Social Sciences for Secondary School Pupils
(Draft)

Dr. P.K. Sudheesh Kumar
&
K.K. Shanmugha Das

Instructions:

This is an Achievement Test in Social Sciences. Four possible answers are given for each question in the order A, B, C, D. One of them is correct. Find out the correct answer. Separate answer sheet is given in which letters A, B, C, D are marked against each question number. Mark your correct answer in the answer sheet by putting X mark on the letter that stands for the correct answer. In case you have marked X at a wrong place draw a circle around it ⊗ and mark for the correct answer. Don't forget to mark your answer to all questions.

Example:

1. Where is the capital of India?

A. Thiruvananthapuram B. Mumbai C. New Delhi D. Kolkata

Qn. No. 1

		X	
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1. Who crodified the Mesopotamian Code of Laws?

A. Hammurabi B. Khufu C. Alexander D. Nannar

2. Name the alphabet used by Ancient Egyptians

A. Cuneiform B. Teracotta C. Arabic D. Hieroglyphics

3. Who of the following was the famous Greek poet?

A. Herodotus B. Sophocles C. Homer D. Aristotle

4. Where was the first capital of Arabian Empire?

A. Mecca B. Medina C. Demascus D. Jeddah

5. The Glorious Revolution of England took place in which year?

A. 1688 B. 1878 C. 1808 D. 1668

6. Name the Chinese traveller who visited India during the period of Harsha

A. Fa-hein B. Hiuen-Tsang C. Ma-huan D. Sun-Yat-Sen

7. Which is the lower most layer of Atmosphere?
A. Troposphere B. Heterosphere C. Stratosphere D. Ionosphere
8. Which equipment is used to measure atmospheric pressure?
A. Thermometer B. Ammeter C. Barometer D. Hygrometer
9. Which of the following is known as 4 O' clock rain?
A. Orographic Rainfall B. Cyclonic Rainfall
C. Border Rainfall D. Convectional Rainfall
10. Name the largest trench in the world
A. Puerto-Rico trench B. Challenger trench
C. Wharton trench D. Mariana trench
11. What is the time difference between two tides?
A. 12 hours and 25 minutes B. 10 hours and 50 minutes
C. 10 hours and 25 minutes D. 12 hours and 50 minutes
12. What is the name of North equatorial current along the east coast of Asia?
A. Oyashio B. Humboldt cold current
C. British Columbia current D. Kuroshio
13. Coral reefs are formed by which of the following creatures?
A. Plovers B. Octopus C. Coral polyps D. Crabs
14. Which part of the sea is most appropriate for the growth of plants and animals?
A. Abyssal plain B. Continental shelf
C. Sea mounts D. Continental rise
15. Name the country that occupied one-fourth of the world export of coal.
A. Australia B. U.S.A. C. India D. Saudi Arabia
16. Which of the following is non-renewable resource?
A. Fish B. Forest C. Coal D. Water
17. Which state is the home of Bharatha Natyam?
A. Andhra Pradesh B. Kerala
C. Maharashtra D. Tamil Nadu
18. The Olympic game was started to honour which of the following gods?
A. Zeus B. Appolo C. Poseiden D. Pericles
19. Which is the upper house of Indian Parliament?
A. Rajya Sabha B. Lok Sabha
C. Cabinet D. Legislative Assembly
20. Name the apex court of a state.
A. Supreme Court B. High Court
C. Munsiff Court D. Sessions Court

21. What an economy that works on private property is called?
A. Capitalism B. Socialism
C. Developing economy D. Mixed economy
22. Name the Central Bank of India
A. State Bank of India B. Industrial Development Bank of India
C. Reserve Bank of India D. Union Bank of India
23. What is the reward for organisation?
A. Wages B. Interest C. Lease D. Profit
24. All natural resources used in production process belongs to which of the following?
A. Capital B. Land C. Factors D. Organisational factors
25. What led to the permanent settlement of man in Neolithic Age?
A. To make food production and cattle rearing easy.
B. To defeat enemies C. To make the governance easy
D. For easy hunting
26. The main defect of Mesopotamian calendar was that it was based on one of the following. What is that?
A. Sun B. Months C. Moon D. Earth
27. What was the remarkable achievement of Egyptian civilization?
A. Socio-economic development B. Agro-Industrial Development
C. Better defence systems D. Achievement in Architecture
28. What type of places are suitable for the emergence of civilizations?
A. Coastal areas B. River valleys C. Plateaus D. Plains
29. In ancient China there were carvings of Lotus, Dragon and Horse. What does it indicate?
A. They were worshipped B. Belief in Taoism
C. Excellence in architecture D. Existence of pictograph
30. What do you mean by a Greek City State?
A. An area centred round a city B. A country with number of cities
C. A country that depend only on cities D. An area centred round by cities
31. Why Roman laws are treated as a great contribution to the world?
A. Roman laws are formed by codifying world laws
B. Many countries modelled Roman laws
C. Romans were the first law makers
D. Roman laws protect world interest
32. After the arrival of Moses what change took place in the religious belief of Jews?

- A. Believed a variety of gods. B. Believed in Jesus
C. Believed as the 'Chosen People' D. Believed in one god
33. Why it is said that Muslims believe in life after death?
A. They perform post-death rites B. Believe that all men shall receive rewards for their earthly actions C. The other religions believe so
D. Adorn neat dress on dead bodies.
34. What do the remnants of Inca's city of Machu Picchu indicate?
A. Good social life B. Number of graneries
C. Excellence in engineering and architecture D. A temple city
35. Why Christianity was recognised in Roman empire?
A. It became popular B. All Romans became Christians
C. Church demanded it. D. Christians led monastic life.
36. Why the renaissance called intellectual awakening?
A. There were number of new inventions. B. It happened in medieval Europe C. Studies based on ancient Greek-Roma civilizations were conducted
D. It started in Italy.
37. Why was Latin language considered as the vehicle of Medieval European culture?
A. Then Latin was the only language used B. Believed that Latin was the most suitable language. C. Latin was the ancient language of Romans.
D. Latin was widely used in cultural and literal activities
38. What circumstances led to the conflict between King and Parliament in England?
A. King failed to rule as per the will of people. B. Members of Parliament were ambitious of power. C. People supported the King.
D. Parliament recognised that Royal power is divine.
39. What are the main principles of Buddhism and Jainism?
A. Prayer and belief in God B. Non-violence and purity of Karma
C. Sacrifices and rituals D. Idol worship and monasticism
40. The coins issued by Kanishka had pictures of gods of different communities. What does it show?
A. He believed in many gods. B. His coins were used by all
C. He respected all religions. D. His period was rich and splendid.
41. A responsible citizen is a person with one of the following characteristics. What is that?
A. Gives importance to duties than rights. B. Does his duties besides enjoying rights. C. Obays all the laws. D. Dedicated himself to the country.
42. What is the basic responsibility of a Panchayath?

- 4

- A. There is deforestation B. Wind blows over there lacks water vapour.
C. There the wind blows in the opposite directions.
D. There is shortage of mountains.
52. Why the polar regions are under high pressure?
A. There is no human inhabitation. B. They are extremely cold regions.
C. They are high altitude regions. D. There is shortage of air.
53. Why the western ghats is called a watershed?
A. It is the source of number of rivers. B. It is a higher ground separating two adjoining drainage basins. C. It is a mountain region with heavy rainfall.
D. Two important rivers flow over there.
54. What do you call the return of water to atmosphere as water vapour?
A. Oxygen Cycle B. Convectional rainfall
C. Precipitation D. Water cycle
55. Lion is treated a secondary consumer as it eats one of the following. What is that?
A. Primary consumers B. Secondary consumers
C. Tertiary consumers D. Carnivores
56. Why the decomposers are called the saniters of earth?
A. Preserving dead organisms B. Decomposing dead organisms
C. Decomposing bacteria and fungi D. Preserving bacteria and fungi
57. Which of the following is the speciality of Pacific Ocean?
A. Good climate B. Deepest and vast
C. Number of trenches D. Number of cold currents
58. What do you understand from the fact that Moon, though smaller in size exerts more influence on tides than sun?
A. Earth is a small planet in solar system. B. The gravitational pull of sun is less than moon on earth. C. The gravitational force of sun is scattered in solar system. D. Moon has more gravitational force than sun.
59. Coal is called a fossil fuel. What do you mean by this?
A. Man has been using it for many years. B. Coal is very important to organisms.
C. Plants require coal and solar energy.
D. It is the energy stored by plants long ago.
60. How energy is produced in the Sun?
A. Hydrogen is transformed into Nitrogen B. Helium is transformed into Hydrogen. C. Hydrogen is transformed into Helium. D. Nitrogen is transformed into Hydrogen.
61. Which of the following is a feature of a free market economy?

- A. High quality goods only are sold in the market. B. Increased government interference in the market. C. All goods are sold in the market. D. Most of the production is in the market sector.
62. Why price mechanism is called the 'invisible hand'?
- A. It influences the economic growth. B. It cannot influence the level of production. C. It causes inflation. D. It controls the production pattern.
63. Why India is called a mixed economy?
- A. It carries good features of both capitalism and socialism.
B. High priority to socialist ideas.
C. It is stated in the constitution. D. India has high growth rate.
64. Why inflation causes great hardship to common people?
- A. It leads to price rise. B. Rate of profit increases.
C. Level of production falls. D. Fall in money supply.
65. Why banks, insurance companies, railways etc. are treated as tertiary sector?
- A. Important for economic development. B. They are service sectors.
C. They are in public sector. D. Important institutions to man.
66. 45% of India's national income is in the hands of 10% of the population. What does it indicate?
- A. Poverty in India B. Economic inequality
C. Most Indians are poor. D. Slow growth rate.
67. What type of calendar you will make to correct the defect of Mesopotamian calendar?
- A. A lunar calendar B. A solar calendar
C. A calendar with equal number of days
D. A calendar based on earth's rotation.
68. How will you utilise the teachings of Lao-Tze and Confucius?
- A. For the social and moral regeneration B. For the economic development.
C. For democracy and secularism D. To educate Indians about Chinese life.
69. What is the role of Buddhism and Jainism in your life?
- A. Belief in non-violence and Vedas B. Belief in sacrifices and eight fold paths
C. A life based on non-violence and purified 'karma'
D. Daily worship and rites.
70. How will you utilise the message of Glorious Revolution of England?
- A. Persuading the people to oppose the government B. Persuading the administration to rule on people's will
C. Working for an administration of parliament D. Persuading administration to give liberty to people.
71. What will you do to learn more about 'Kathakali'?

- A. Reading the 'Natyasastra' of Bharatamuni B. Seeing the performance of Kathakali
C. Conducting Kathakali competition
D. Studying in Kerala Kalamandalam.
72. If you want to know more about 'Sabha' and 'Samiti' of Aryans, what you are required to study?
A. Remainings of Harappan civilization B. Upanishats C. Epics D. Vedas
73. What can you do to solve the socio-economic problems of the villages?
A. Assuring the good functioning of local bodies. B. Persuading the state government to solve them. C. Assure that all villagers vote in elections to panchayaths D. Opening schools in all villages.
74. If your freedom of expression is violated whom will you approach to safeguard it?
A. The State Governor B. Munsiff Court
C. High Court D. The President of India.
75. As a responsible citizen of the country which of the following is your duty?
A. Preaching my religion everywhere B. Travelling freely and expressing my opinion
C. Taking legal action if rights are violated
D. Conscious of rights of others while enjoying my rights.
76. How an Indian citizen with 18 years will exercise his primary democratic right?
A. Persuading all citizens to vote in elections. B. Freely exercising the right to vote.
C. Freely contesting in all elections.
D. Besides voting contesting in elections.
77. If you are asked to choose a place to conduct Summer Olympics which of the following areas will be suggested?
A. Between $23\frac{1}{2}^{\circ}$ and $66\frac{1}{2}^{\circ}$ from the equator B. Upto $23\frac{1}{2}^{\circ}$ from the equator.
C. Between $66\frac{1}{2}^{\circ}$ and 90° from the equator.
D. Between $23\frac{1}{2}^{\circ}$ N latitude to $23\frac{1}{2}^{\circ}$ S. latitude.
78. The atmospheric pressure at your school is 73 cm. Can you say whether your school is above or below the sea level?
A. Below sea level as it is above 67 cm. B. Above sea level as it is above 67 cm.
C. Below sea level as it is below 76 cm. D. Above sea level as it is below 76 cm.
79. What effort you will make considering the fact that man may have to depend more on oceans in the future?
A. Desisting from sea wars. B. Preventing deep sea fishing.
C. Preventing sea pollution. D. Abolishing oil excavation in sea.
80. What can you do to prevent the destruction of coral reefs?
A. Preventing shipping in this area B. Discouraging the use of submarines
C. Taking steps to prevent soil erosion. D. Discouraging fishing.
81. For the conservation of wild life which of the following you will adopt?

- A. Encouraging afforestation and preventing trespassing to forests.
 B. Construction of Zoos C. Bringing wild animals from abroad
 D. Encouraging hunting.
82. If you are asked to prepare a map showing the distribution of High Schools in your Panchayath which of the following you will prepare?
 A. A large scale map. B. A small scale map.
 C. A list of all High Schools. D. Pictures of all High Schools.
83. Suppose you like to cultivate coconut trees on five hectares of land what agricultural credit you will take?
 A. Short term loan from a co-operative bank. B. Long term loan from Central Bank.
 C. Long term loan from Land Development Bank.
 D. Short term loan from Industrial Development Bank of India.
84. Suppose your new radio is not working well and the seller is not ready to give compensation. To protect your interest where will you complain?
 A. In State consumer protection forum. B. In district court.
 C. In High Court. D. In district consumer protection forum.
85. Man might see number of animals on river banks where he settled. Some of them were domesticated by him. What does this show?
 A. Man cannot live without animals. B. Man likes all animals.
 C. Man can understand the special features of animals.
 D. Only man can protect animals.
86. Ancient Egyptians had a technique of preserving dead bodies by embalming. How will you explain this spectacular achievement?
 A. They offered a new scientific knowledge to the world. B. They had deep knowledge of human anatomy and science.
 C. They worshipped dead bodies.
 D. They believed in life after death.
87. In ancient China the impact of Buddhism reflected in art, architecture and sculpture. What does it show?
 A. They applied Buddhism in different spheres of life. B. They wanted to please lord Buddha.
 C. All people in China were believers of Buddhism.
 D. It was a goal of Buddhism.
88. The humanism which emerged during Renaissance believed in tremendous potentialities of man and argued that it is not divine. What is the essence of this belief?
 A. Fraternity and love. B. Emphasis on greatness of man and studies centred around man.
 C. Man is more powerful than God.
 D. A blind belief in man's potentiality.
89. Aeroplanes usually fly above the tropopause to safe guard them from bumpy air pockets. What does it mean?

- A. Aeroplanes never fly through tropopause B. Aeroplanes that fly through tropopause usually confront with air crash. C. If aeroplanes fly through tropopause there is a possibility of air crash. D. Though aeroplanes fly through tropopause air crash is common.
90. In the lower part of stratosphere temperature remains constant but in the upper part it rises. However in thermosphere temperature reaches over 700°C. How will you differentiate the temperature structure of these two layers?
- A. Temperature is inconsistent in both layers. B. No serious differences in temperature of both layers. C. Though temperature is high in both layers it is inconsistent in the lower part of stratosphere. D. In stratosphere first the temperature remains constant and as the height increases it rises, while thermosphere is a zone of rapid temperature increase.
91. When land is used for different purposes its per-capita availability decreases. What does it indicate?
- A. Prudent use of land is inevitable. B. Using the land for non-agrarian purposes should be restricted. C. If used only for agrarian purposes its per-capita availability can be increased. D. Land should be used only for agrarian purposes.
92. 70% of world's atomic power plants situate in Western Europe, U.S.A. and Japan. What does it show?
- A. These countries monopolise atomic power plants. B. Developed countries have better technology and more facilities for atomic power generation. C. The technology and facilities for the generation of atomic power is available only in developed countries. D. These countries only are suitable for the establishment of atomic power stations.
93. How do you describe the functioning of village panchayats in Kerala?
- A. Protecting the agro-industrial requirements of villages. B. Protecting the democratic and civic rights of villagers. C. Basic democratic and self governing bodies of villages. D. Self governing bodies that irradiate unemployment of villagers.
94. In India protecting the life and property of people is an important responsibility of state governments. What does it imply?
- A. Only state governments can effectively utilise the police force. B. As the state government has close contact with the people law and order is its responsibility. C. In India only state governments can form the police force. D. As per the constitution law and order is the responsibility of state governments.
95. In most of the developing countries wooden plough and bullocks are used for ploughing the land, but in developed countries modern machinery and techniques are used. How do you explain this situation?
- A. In developing countries primitive techniques of production are used.
B. In developed countries machinery is used in all productive activities.

- C. In developing countries modern machinery and techniques are not needed in productive activities. D. The only difference is that in developed countries modern machinery and equipments are used.
96. The Planning Commission study the factors affecting national income of the country and evaluate the functioning of the economy. What is meant by this?
A. To plan on the basis of country's national income. B. To find out the role of Five Year Plans in national income. C. To plan in such a way as to raise the national income. D. To find out the relationship between national income and economic growth.
97. The evidences of Indus Valley Civilization are found in Mohenjadarro, Harappa, Rupar in Punjab, Kalibargan in Rajasthan, Lothal in Gujarat and Banawali in Haryana. What do you conclude from this?
A. This civilization was spread over a vast area and laid foundation for India's culture. B. It was a more developed civilization than others and continued for long time. C. It arose separately in different places.
D. It declined because of the continuous attack of enemies.
98. Aryans worshipped natural phenomena like Indra, Varuna and Surya as Gods. What do you find out from this?
A. Aryans worshipped only the natural powers. B. The natural powers are only Indra, Varuna and Surya. C. Aryans built number of temples for the natural phenomena. D. Aryans believed a variety of gods.
99. The famous astronomers like Varahamihira and Aryabhatta, the author of 'Aryabhatteeyam' lived during the period of Guptas. What idea do you find out from this?
A. 'Aryabhatteeyam' is a source work in astronomy. B. Famous astronomers lived in ancient India only. C. Deep studies in astronomy were conducted in ancient India. D. The great achievement in ancient India was only in astronomy.
100. People of ancient India had religious freedom. They had the good qualities like compassion, modesty, respecting guests etc. What do you find out from this?
A. In ancient India religious tolerance was compulsory. B. High human values were always respected in India. C. In ancient India rulers recognised the civic rights of people. D. Religious freedom was allowed because people had good qualities.
101. Water that forms 71% of earth's surface exists in the form of ice in polar regions, water-vapour in the atmosphere and in liquid form under the surface of earth. What concept do you find out here?
A. Water can occur in three forms like solid, liquid and gas. B. The organisms exist because water occurs in three forms. C. As 71% of earth's surface consists of water it occurs in three forms. D. As water occurs in three forms 71% of earth's surface consists of water.

102. Rockets and satellites pass through thermosphere where the temperature reaches as high as 700°C . What do you conclude from it?
- A. The high temperature of this sphere does not affect them. B. The rockets and satellites pass through this sphere require temperature defence system. C. As the rockets and satellites pass with a high speed they defend the high temperature. D. The rockets and satellites are launched when the temperature in this sphere comes down.
103. The north and south polar regions remain high pressure zones because of the least quantity of solar energy they receive. What do you find out from this?
- A. High pressure in polar regions is due to high temperature. B. Pressure falls when temperature reduces. C. Pressure rises when temperature falls. D. Pressure and temperature are interrelated in polar regions only.
104. Moisture affects rate of evaporation. Dry air can take up more water. What concept related to rate of evaporation are you developing from this?
- A. It is more in plateaus than in deserts. B. It is less in deserts than in coastal areas. C. It is more in polar regions than in deserts. D. It is more in deserts than in polar regions.
105. Supreme court has the power to check the constitutional validity of laws and issue orders for the enforcement of fundamental rights. What do you find out from this?
- A. In case of violation of fundamental rights citizens have to move only to Supreme Court. B. At the time of legislation government has to consult the supreme court. C. Only Supreme Court has these powers. D. Supreme Court can function as the guardian of the constitution and fundamental rights.
106. The president of India exercises his powers on the advice of the prime minister and the council of ministers. What do you conclude from this?
- A. Though President is the Constitutional Head he has no executive powers. B. If president worked independently he will be impeached. C. The powers of the president are controlled by the constitution of India. D. If the president worked independently there will be constitutional dead-lock.
107. Working on profit motive, wastage of competition, prominence to private property are the main defects of capitalism. What do you find out from this?
- A. In a developing country like India capitalism is the most suitable system. B. In a developing country like India mixed economy is the most suitable system. C. For achieving high growth rate India needs capitalist system. D. In order to solve the problem of poverty and unemployment India needs capitalist system.
108. Under utilisation of resources, shortage of capital, high growth rate of population are the features of Indian economy. It shows that Indian economy is an example for one of the following economies. Choose it.

- A. Developing economy B. Capitalist economy.
C. Developed economy D. Mixed economy.
109. If you evaluate that Indus valley civilization was much deep rooted than Egyptian civilization what is the basis of it?
- A. Indus valley civilization laid the foundation for modern Indian culture.
B. People of Indus valley had better town planning than Egyptians.
C. This civilization lasted a longer period than Egyptian civilization.
D. The remnants of great bath were excavated at Indus valley only.
110. In Japan due to heavy burden of taxation peasants deserted the lands. So the government redistributed the land to Samarai or warriors. How do you evaluate this incident?
- A. Government had no other option. B. It was harmful to peasants who are the real producers in the farm sector. C. Peasants should have paid the tax by raising the output. D. Though it was harmful to peasants Samarais benefited by it.
111. During the period of reformation catholic church made the punishment obligatory and excommunicated those who defied the church. How do you evaluate these measures taken by Pope?
- A. Pope was successful in discharging his duties. B. Though these measures were essential it could be avoided. C. These measures were not conducive to the unity of the church. D. These measures during that period were essential and unavoidable.
112. Prophet Muhammed encouraged the superstitious and ignorant Arabs to acquire knowledge and he taught them goodness and brotherhood. How do you explain this?
- A. He could make Arabs a strong military power. B. Though he could civilize them there was no unity. C. He could civilize and unite them. D. Many educational institutions and orphanages were established in Arabia.
113. India follows a mixed economic system with features of capitalism and socialism. How do you evaluate the performance of Indian economy?
- A. Private sector protects the interest of government. B. Private sector protects the interest of general public. C. Government protects the interest of private sector. D. Besides private sector government also plays an important role in the economy.
114. India, a country with just 2.4% of the total land area of the world carries 16% of the world population. How do you see the impact of population explosion on Indian economy?
- A. In a developing economy like India, the pace of economic growth is stagnated. B. Though the growth rate is stagnated in the initial stages, it increases later on. C. High growth rate can be achieved using the increased human resources. D. It does not affect the growth rate as there is sufficient infrastructural facilities.

115. The over use of resources is detrimental to ecological balance. What suggestions do you have to solve this problem?
- A. Discuss the problem in the United Nations and find out a solution
 B. Legislation by all countries to preserve resources. C. Forming a committee of experts to find out ways to preserve resources. D. Educating people for scientific and prudent exploitation of resources.
116. The increased human activities in the modern period lead to pollution of seas. How do you evaluate it?
- A. Though sea pollution cannot be prevented efforts should be made to reduce it. B. Though sea pollution is quite common it should not cause ecological imbalance. C. Effort should be made to avert sea pollution in all human activities. D. As sea pollution is unavoidable the efforts to prevent it is meaning less.
117. Habitats comprise not only living beings but a number of non-living elements also. On the basis of it evaluate the functioning of a habitate?
- A. If living beings form self-supporting communities they need not depend on non-living elements. B. The living beings depend on non-living elements and form self-supporting communities. C. The living beings need not depend on non-living elements except for food. D. The importance of non-living elements is less than that of living beings.
118. The ultraviolet rays that come through the ozone hole are highly harmful to mankind. What do you suggest to solve this problem?
- A. Educate the people to eliminate the causes of ozone hole.
 B. Countries should eliminate the causes of ozone hole by legislation.
 C. Prevent the harmful effects caused by ultraviolet rays.
 D. Educate the people about the harmful effects of ultraviolet rays.
119. According to Gandhiji Local Self Governments should be effectively utilised for the all round development of villages where most Indians live. How do you evaluate Gandhiji's view?
- A. Gandhiji believed that villages cannot progress in the absence of Local Self Governments. B. It shows the practical sense of Gandhiji who had close contact with Indian villages. C. Gandhiji thought that it is required to develop a democratic sense among the villagers. D. Gandhiji believed that the success of Indian democracy depends on Local Self Governments.
120. In India defence, railways, atomic energy etc. are included in the Union List and law and order, public health, agriculture etc. are in the State List. How do you evaluate this type of power sharing.
- A. In a vast nation like India a federal system of power sharing is effective.
 B. Though the federal system is useful, the power sharing is not effective.
 C. For national unity it is better to give all major powers to the central government.
 D. For achieving regional autonomy all major powers should be given to state governments.

Appendix V.C

UNIVERSITY OF CALICUT DEPARTMENT OF EDUCATION

Achievement Test in Social Sciences for Secondary School Pupils

(DRAFT)

RESPONSE SHEET

Name of student Age:

Class : Class No.: Girl/Boy

Qn. No.					Qn. No.					Qn. No.					Qn. No.				
1	A	B	C	D	31	A	B	C	D	61	A	B	C	D	91	A	B	C	D
2	A	B	C	D	32	A	B	C	D	62	A	B	C	D	92	A	B	C	D
3	A	B	C	D	33	A	B	C	D	63	A	B	C	D	93	A	B	C	D
4	A	B	C	D	34	A	B	C	D	64	A	B	C	D	94	A	B	C	D
5	A	B	C	D	35	A	B	C	D	65	A	B	C	D	95	A	B	C	D
6	A	B	C	D	36	A	B	C	D	66	A	B	C	D	96	A	B	C	D
7	A	B	C	D	37	A	B	C	D	67	A	B	C	D	97	A	B	C	D
8	A	B	C	D	38	A	B	C	D	68	A	B	C	D	98	A	B	C	D
9	A	B	C	D	39	A	B	C	D	69	A	B	C	D	99	A	B	C	D
10	A	B	C	D	40	A	B	C	D	70	A	B	C	D	100	A	B	C	D
11	A	B	C	D	41	A	B	C	D	71	A	B	C	D	101	A	B	C	D
12	A	B	C	D	42	A	B	C	D	72	A	B	C	D	102	A	B	C	D
13	A	B	C	D	43	A	B	C	D	73	A	B	C	D	103	A	B	C	D
14	A	B	C	D	44	A	B	C	D	74	A	B	C	D	104	A	B	C	D
15	A	B	C	D	45	A	B	C	D	75	A	B	C	D	105	A	B	C	D
16	A	B	C	D	46	A	B	C	D	76	A	B	C	D	106	A	B	C	D
17	A	B	C	D	47	A	B	C	D	77	A	B	C	D	107	A	B	C	D
18	A	B	C	D	48	A	B	C	D	78	A	B	C	D	108	A	B	C	D
19	A	B	C	D	49	A	B	C	D	79	A	B	C	D	109	A	B	C	D
20	A	B	C	D	50	A	B	C	D	80	A	B	C	D	110	A	B	C	D
21	A	B	C	D	51	A	B	C	D	81	A	B	C	D	111	A	B	C	D
22	A	B	C	D	52	A	B	C	D	82	A	B	C	D	112	A	B	C	D
23	A	B	C	D	53	A	B	C	D	83	A	B	C	D	113	A	B	C	D
24	A	B	C	D	54	A	B	C	D	84	A	B	C	D	114	A	B	C	D
25	A	B	C	D	55	A	B	C	D	85	A	B	C	D	115	A	B	C	D
26	A	B	C	D	56	A	B	C	D	86	A	B	C	D	116	A	B	C	D
27	A	B	C	D	57	A	B	C	D	87	A	B	C	D	117	A	B	C	D
28	A	B	C	D	58	A	B	C	D	88	A	B	C	D	118	A	B	C	D
29	A	B	C	D	59	A	B	C	D	89	A	B	C	D	119	A	B	C	D
30	A	B	C	D	60	A	B	C	D	90	A	B	C	D	120	A	B	C	D

Appendix V.D

Achievement Test in Social Sciences for Secondary School Pupils (Draft)

Scoring Key

Qn. No.	Answer
1	A
2	D
3	C
4	B
5	A
6	B
7	A
8	C
9	D
10	B
11	A
12	D
13	C
14	B
15	A
16	C
17	D
18	A
19	A
20	B
21	A
22	C
23	D
24	B
25	A
26	C
27	D
28	B
29	C
30	A

Qn. No.	Answer
31	B
32	D
33	B
34	C
35	A
36	C
37	D
38	A
39	B
40	C
41	B
42	A
43	B
44	C
45	B
46	B
47	A
48	C
49	C
50	B
51	C
52	B
53	B
54	D
55	A
56	B
57	B
58	B
59	D
60	C

Qn. No.	Answer
61	D
62	D
63	A
64	A
65	B
66	B
67	B
68	A
69	C
70	B
71	D
72	D
73	A
74	C
75	D
76	B
77	A
78	D
79	C
80	C
81	A
82	B
83	C
84	D
85	C
86	B
87	A
88	B
89	C
90	D

Qn. No.	Answer
91	A
92	B
93	C
94	D
95	A
96	C
97	A
98	D
99	C
100	B
101	A
102	B
103	C
104	D
105	D
106	C
107	B
108	A
109	A
110	B
111	C
112	C
113	D
114	A
115	D
116	C
117	B
118	A
119	B
120	A

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
Achievement Test in Social Sciences for Secondary
School Pupils. (Final)
Dr. P.K. Sudheesh Kumar & K.K. Shanmugha Das.

നിർദ്ദേശങ്ങൾ :

ഇത് ഒരു സോഷ്യൽ സയൻസ് ടെസ്റ്റാണ്. ഓരോ ചോദ്യത്തിനും A,B,C,D എന്നീ ക്രമത്തിൽ നാല് ഉത്തരങ്ങൾ വീതം കൊടുത്തിരിക്കുന്നു. അവയിൽ ഒന്ന് മാത്രമാണ് ശരി. ഓരോ ചോദ്യത്തിന്റെയും ശരിയായ ഉത്തരം കണ്ടുപിടിക്കുക. ഉത്തരങ്ങൾ അടയാളപ്പെടുത്താനായി തന്നിരിക്കുന്ന കടലാസിൽ ഓരോ ചോദ്യനമ്പരിനും നേരെ A,B,C,D എന്നീ അക്ഷരങ്ങൾ രേഖപ്പെടുത്തിയിട്ടുണ്ട്. നിങ്ങളുടെ ശരി ഉത്തരത്തെ കുറിക്കുന്ന അക്ഷരത്തിനുമുകളിൽ 'X' എന്ന അടയാളമിട്ട് ഉത്തരങ്ങൾ രേഖപ്പെടുത്തുക. നിങ്ങളുടെ ഉത്തരം തെറ്റായ സ്ഥാനത്താണ് അടയാളപ്പെടുത്തിയത് എങ്കിൽ അതിനുചുറ്റും ഒരു വൃത്തം വരയ്ക്കുകയും (X) ശരിയായ സ്ഥാനത്ത് ചിഹ്നം ഇടുകയും ചെയ്യുക. എല്ലാ ചോദ്യങ്ങൾക്കും ഉത്തരം അടയാളപ്പെടുത്താൻ മറക്കരുത്.

മാതൃക:

Qn. No.1. ഇന്ത്യയുടെ തലസ്ഥാനം എവിടെയാണ് ?

A. തിരുവനന്തപുരം B. മുംബായ് C. ന്യൂഡൽഹി D. കൊൽക്കത്ത

A	B	C	D
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- പുരാതന ഈജിപ്തിലെ ജനങ്ങൾ ഉപയോഗിച്ചിരുന്ന അക്ഷരമാലയുടെ പേരെന്ത് ?
 A. ക്യൂണിഫോം B. ടെറാക്കോട്ട C. അറബിക് D. ഹൈറോഗ്ലിഫിക്സ്
- താഴെ പറയുന്നവരിൽ സുപ്രസിദ്ധ ഗ്രീക്ക് കവി ആര് ?
 A. ഹെറോഡോട്ടസ് B. സോഫോക്ലിസ് C. ഹോമർ D. അരിസ്റ്റോട്ടിൽ
- അന്തരീക്ഷത്തിലെ ഏറ്റവും താഴെയുള്ള മണ്ഡലമേത് ?
 A. ട്രോപ്പോസ്ഫിയർ B. ഹെറ്ററോസ്ഫിയർ C. സ്ട്രോറ്റോസ്ഫിയർ D. അയണോസ്ഫിയർ
- അന്തരീക്ഷമർദ്ദം അളക്കുന്നതിനുള്ള ഉപകരണമേത് ?
 A. തെർമോമീറ്റർ B. അമ്മീറ്റർ C. ബാരോമീറ്റർ D. ഹൈഗ്രോമീറ്റർ
- ഉത്തര മധ്യരേഖാ സമുദ്രജല പ്രവാഹം ഏഷ്യയുടെ കിഴക്കൻ തീരത്ത് ഏതുപേരിൽ അറിയപ്പെടുന്നു?
 A. ഒയാഷിയോ B. ഹംബോൾട്ട് ശീതജലപ്രവാഹം
 C. ബ്രിട്ടീഷ് കൊളംബിയ പ്രവാഹം D. കുറോഷിയോ
- ജീവജാലങ്ങളുടെ വളർച്ചയ്ക്ക് അനുയോജ്യമായ സമുദ്ര ഭാഗമേത് ?
 A. അഗാധ സമുദ്രതലം B. വൻകരത്തട്ട് C. സമുദ്രാചലം D. വൻകരക്കയരം
- താഴെ പറയുന്നവരിൽ പുനസ്ഥാപിക്കപ്പെടാത്ത വിഭവമേത് ?
 A. മത്സ്യം B. വനം C. കൽക്കരി D. ജലം
- ഭരതനാട്യത്തിന്റെ ജന്മദേശമേത് ?
 A. ആന്ധ്രാപ്രദേശ് B. കേരളം C. മഹാരാഷ്ട്രം D. തമിഴ്നാട്
- ഒളിമ്പിക്സ് ആരംഭിച്ചത് ഏത് ദേവനെ പ്രീതിപ്പെടുത്തുന്നതിന് വേണ്ടിയായിരുന്നു ?
 A. സൂര്യൻ B. അപ്പോളോ C. പോസിഡൺ D. പെരിക്ലിസ്
- സ്വകാര്യ സ്വത്തിനെ അടിസ്ഥാനപ്പെടുത്തിയുള്ള സമ്പദ് വ്യവസ്ഥ ഏത് പേരിൽ അറിയപ്പെടുന്നു ?
 A. മുതലാളിത്ത സമ്പദ് വ്യവസ്ഥ B. സോഷ്യലിസ്റ്റ് സമ്പദ് വ്യവസ്ഥ
 C. വികസന സമ്പദ് വ്യവസ്ഥ D. മിശ്രസമ്പദ് വ്യവസ്ഥ
- ഇന്ത്യയിലെ കേന്ദ്രബേങ്ക് ഏത് ?
 A. സ്റ്റേറ്റ് ബേങ്ക് ഓഫ് ഇന്ത്യ B. ഇന്ത്യൻ വ്യവസായ വികസന ബേങ്ക്
 C. റിസർവ് ബേങ്ക് ഓഫ് ഇന്ത്യ D. യൂണിയൻ ബേങ്ക് ഓഫ് ഇന്ത്യ
- ഉൽപ്പാദന പ്രക്രിയയിൽ സംഘാടനത്തിന് കിട്ടുന്ന പ്രതിഫലം എന്ത് ?
 A. കൂലി B. പലിശ C. പാട്ടം D. ലാഭം

13. നവീന ശിലായുഗത്തിൽ മനുഷ്യനെ സ്ഥിരതാമസത്തിന് പ്രേരിപ്പിച്ച സാഹചര്യം എന്ത് ?
 A. ഭക്ഷ്യോല്പാദനവും കന്നുകാലി സംരക്ഷണവും എളുപ്പമാക്കാൻ.
 B. ശത്രുക്കളെ പരാജയപ്പെടുത്താൻ C. രാജ്യഭരണം സുഗമമാക്കാൻ.
 D. വേട്ടയാടൽ എളുപ്പമാക്കാൻ.
14. മെസോപ്പൊട്ടേമിയൻ കലണ്ടറിന്റെ ന്യൂനത അത് താഴെ പറയുന്ന ഒന്നിനെ അടിസ്ഥാനപ്പെടുത്തി യുള്ളതാണ് എന്നതാണ്. അതെന്താണ് ?
 A. സൂര്യൻ B. മാസങ്ങൾ C. ചന്ദ്രൻ D. ഭൂമി
15. ഈജിപ്തു സംസ്കാരത്തിന്റെ എടുത്തുപറയത്തക്ക സവിശേഷതയെന്ത് ?
 A. സാമൂഹിക - സാമ്പത്തിക പുരോഗതി B. കാർഷിക - വ്യവസായിക പുരോഗതി
 C. മികച്ച രാജ്യരക്ഷാ തന്ത്രങ്ങൾ D. വാസ്തു ശില്പ രംഗത്തെ മികവ്
16. സംസ്കാരങ്ങൾ ഉടലെടുക്കാൻ അനുയോജ്യമായത് എങ്ങനെയുള്ള പ്രദേശങ്ങളാണ് ?
 A. തീരപ്രദേശങ്ങൾ B. നദീതടങ്ങൾ C. പീഠഭൂമികൾ D. സമതലങ്ങൾ
17. പുരാതന ചൈനയിൽ താമര, കൂതിര, വ്യാളി എന്നിവയുടെ രൂപങ്ങൾ മനോഹരമായി ആലേഖനം ചെയ്തുവെച്ചിരിക്കുന്നു. ഇത് സൂചിപ്പിക്കുന്നതെന്ത് ?
 A. അവയെ ആരാധിച്ചിരുന്നു B. താവോ മത വിശ്വാസം
18. മോസസിന്റെ വരവിനുശേഷം ജൂതന്മാരുടെ മതവിശ്വാസത്തിനുണ്ടായ ഒരു പ്രധാന മാറ്റം എന്ത് ?
 A. ബഹുദൈവ വിശ്വാസികളായി. B. യേശുക്രിസ്തുവിനെ ആരാധിച്ചു.
 C. തെരഞ്ഞെടുക്കപ്പെട്ട ജനത എന്നു വിശ്വസിച്ചു. D. ഏകദൈവ വിശ്വാസികളായി.
19. മരണാനന്തര ജീവിതത്തിൽ മുസ്ലീങ്ങൾ വിശ്വസിക്കുന്നു എന്നു പറയാൻ കാരണമെന്ത് ?
 A. അവർ മരണാനന്തര കർമ്മങ്ങൾ ചെയ്യുന്നു.
 B. ലോകജീവിതകാലത്തെ കർമ്മങ്ങൾക്ക് പരലോകത്ത് പ്രതിഫലം ലഭിക്കും എന്നു വിശ്വസിക്കുന്നു.
 C. മറ്റ് മതവിശ്വാസികൾ അങ്ങനെ വിശ്വസിക്കുന്നു.
 D. മൃതശരീരങ്ങളിൽ വൃത്തിയുള്ള വസ്ത്രം അണിയിക്കുന്നു.
20. ലാറ്റിൻ ഭാഷ മദ്ധ്യകാല യൂറോപ്യൻ സംസ്കാരത്തിന്റെ വാഹനമായിരുന്നു എന്നു പറയുന്നതെന്തുകൊണ്ട് ?
 A. അക്കാലത്ത് ലാറ്റിൻ ഭാഷ മാത്രമാണ് ഉപയോഗത്തിലിരുന്നത്.
 B. ലാറ്റിൻ ഭാഷ മാത്രമാണ് അനുയോജ്യം എന്ന് വിശ്വസിച്ചു.
 C. ലാറ്റിൻ പുരാതന റോമിലെ ഭാഷയായിരുന്നു.
 D. എല്ലാ സാഹിത്യ സാംസ്കാരിക രംഗങ്ങളിലും ലാറ്റിൻ ഭാഷയാണ് ഉപയോഗിച്ചിരുന്നത്.
21. ബുദ്ധ - ജൈനമതങ്ങളുടെ അടിസ്ഥാന തത്വങ്ങൾ എന്തൊക്കെ ?
 A. ദൈവവിശ്വാസവും പ്രാർത്ഥനയും. B. അഹിംസയും കർമ്മശുദ്ധിയും.
 C. യാഗങ്ങളും പുജാകർമ്മങ്ങളും. D. വിഗ്രഹാരാധനയും സന്യാസവും.
22. കനിഷ്കൻ പുറത്തിറക്കിയ നാണയങ്ങളിൽ പല വിഭാഗക്കാരുടെയും ദൈവങ്ങളുടെ ചിത്രങ്ങൾ ഉണ്ടായിരുന്നു. ഇതിൽ നിന്നും എന്തു മനസ്സിലാക്കാം ?
 A. കനിഷ്കൻ ബഹുദൈവവിശ്വാസിയാണെന്നു.
 B. കനിഷ്കന്റെ നാണയങ്ങൾ എല്ലാ വിഭാഗക്കാരും ഉപയോഗിച്ചിരുന്നു.
 C. അദ്ദേഹം എല്ലാ മതങ്ങളെയും ബഹുമാനിച്ചിരുന്നു.
 D. കനിഷ്കന്റെ ഭരണകാലം സമ്പൽസമൃദ്ധമായിരുന്നു.
23. ഒരു ഉത്തരവാദിത്തമുള്ള പൗരന്റെ ലക്ഷണം താഴെ പറയുന്നവയിൽ ഏതാണ് ?
 A. അവകാശങ്ങളെക്കാൾ പ്രാധാന്യം ചുമതലകൾക്ക് നൽകുന്നു
 B. അവകാശങ്ങൾ അനുഭവിക്കുന്നതോടൊപ്പം ചുമതലകൾ കൂടി നിർവ്വഹിക്കുന്നു.
 C. എല്ലാ നിയമങ്ങളും അനുസരിച്ച് ജീവിക്കുന്നു.
 D. രാഷ്ട്രത്തിനുവേണ്ടി ആത്മസമർപ്പണം ചെയ്യുന്നു.
24. ഒരു പഞ്ചായത്തിന്റെ അടിസ്ഥാനപരമായ ചുമതല എന്താണെന്ന് പറയാം ?
 A. ഒരു ഗ്രാമത്തിന്റെ സാമൂഹികവും സാമ്പത്തികവുമായ പുരോഗതിക്കു വേണ്ടി പ്രവർത്തിക്കുക.
 B. ഒരു ഗ്രാമത്തിലെ മുഴുവൻ ജനങ്ങളെയും ഭരണത്തിൽ പങ്കാളികളാക്കുക.
 C. ഗ്രാമത്തിലെ മുഴുവൻ ജനങ്ങൾക്കും അവസര സമത്വം ഉറപ്പു വരുത്തുക.
 D. പഞ്ചായത്ത് ഭരണസമിതിയെ യഥാസമയം തെരഞ്ഞെടുക്കുക.
25. ഇന്ത്യ ഒരു മതേതര രാഷ്ട്രമാണെന്ന് പറയുന്നതെന്തുകൊണ്ട് ?
 A. ഏതെങ്കിലും ഒരു മതത്തിൽ മാത്രം വിശ്വസിക്കാനും അത് പ്രചരിപ്പിക്കാനും ഉള്ള സ്വാതന്ത്ര്യം ഇല്ല. B. ഏതെങ്കിലും ഒരു മതത്തിൽ മാത്രം വിശ്വസിക്കാനും അത് പ്രചരിപ്പിക്കാനും ഉള്ള സ്വാതന്ത്ര്യം ഉണ്ട്. C. ഇഷ്ടമുള്ള മതത്തിൽ വിശ്വസിക്കാനും അത് പ്രചരിപ്പിക്കാനും ഉള്ള സ്വാതന്ത്ര്യം ഉണ്ട്. D. മത വിശ്വാസം പാടില്ല.

26. ഭൂമി ഒരു ജലഗ്രഹം എന്ന് വിശേഷിപ്പിക്കപ്പെടുന്നത് എന്തുകൊണ്ട് ?
 A. ഭൂവിസ്തൃതിയുടെ മൂന്നിൽ രണ്ടു ഭാഗവും ജലമാണ് B. ധാരാളം മഴ ലഭിക്കുന്നു
 C. ഭൂമിയിൽ ജലം വിവിധ അവസ്ഥകളിൽ സ്ഥിതി ചെയ്യുന്നു
 D. ഭൂമിയിൽ നിരവധി മഹാസമുദ്രങ്ങൾ ഉണ്ട്.
27. അയണോസ്ഫിയറിന്റെ സാന്നിദ്ധ്യം മനുഷ്യർക്ക് ഉപയോഗപ്പെടുന്നതെങ്ങനെ ?
 A. കാലാവസ്ഥാ പ്രവചനത്തിന് B. ഹ്രസ്വദൂര റേഡിയോ പ്രക്ഷേപണത്തിന്
 C. ദീർഘദൂര റേഡിയോ പ്രക്ഷേപണത്തിന് D. അൾട്രാ വയലറ്റ് രശ്മികളെ കണ്ടെത്തുന്നതിന്
28. ധ്രുവ പ്രദേശങ്ങൾ ഉച്ച മർദ്ദ മേഖലകളായി നിലനിൽക്കുന്നത് എന്തുകൊണ്ട് ?
 A. അവിടെ മനുഷ്യവാസമില്ല. B. അതിശൈത്യം അനുഭവപ്പെടുന്നു.
 C. വളരെ ഉയർന്ന മേഖലകളാണ്. D. വായുവിന്റെ അളവ് കുറവാണ്.
29. വിഘടകരെ ഭൂമിയുടെ രക്ഷാപ്രവർത്തകർ എന്നു പറയുന്നതെന്തുകൊണ്ട് ?
 A. നിർജ്ജീവ ജന്തു സസ്യങ്ങളെ കേടുകൂടാതെ സംരക്ഷിക്കുന്നു.
 B. നിർജ്ജീവ ജന്തു സസ്യ ശരീരങ്ങളെ വിഘടിപ്പിക്കുന്നു.
 C. ബാക്ടീരിയകളെയും ഫംഗസുകളെയും വിഘടിപ്പിക്കുന്നു.
 D. ബാക്ടീരിയകളെയും ഫംഗസുകളെയും സംരക്ഷിക്കുന്നു.
30. താഴെ പറയുന്നവയിൽ പെസഫിക് സമുദ്രത്തിന്റെ പ്രത്യേകത എന്താണ്. ?
 A. നല്ല കാലാവസ്ഥ അനുഭവപ്പെടുന്നു. B. ഏറ്റവും ആഴം കൂടിയതും വിസ്തൃതവുമാണ്
 C. നിരവധി ഗർഭങ്ങൾ ഉണ്ട്. D. ധാരാളം ശീതജല പ്രവാഹങ്ങളുണ്ട്.
31. കൽക്കരിയെ ഒരു ജീവാശ്മ ഇന്ധനം എന്നു വിളിക്കുന്നതിൽ നിന്നും എന്തർത്ഥമാക്കുന്നു ?
 A. നിരവധി വർഷങ്ങളായി മനുഷ്യൻ ഇതുപയോഗിക്കുന്നു.
 B. ജീവജാലങ്ങളുടെ നിലനില്പിനാധാരം കൽക്കരിയാണ്.
 C. ചെടികളുടെ വളർച്ചയ്ക്ക് കൽക്കരിയും സൗരോർജ്ജവും ആവശ്യമാണ്.
 D. യുഗങ്ങൾക്ക് മുമ്പ് ചെടികൾ സംഭരിച്ചു വെച്ച സൗരോർജ്ജമാണ് കൽക്കരി.
32. ഇന്ത്യയെ ഒരു മിശ്ര സമ്പദ് വ്യവസ്ഥ എന്നു വിളിക്കുന്നതെന്തുകൊണ്ട് ?
 A. മുതലാളിത്തത്തിന്റെയും സോഷ്യലിസത്തിന്റെയും നല്ല വശങ്ങൾ ഉൾക്കൊള്ളുന്നു
 B. സോഷ്യലിസ്റ്റ് ആശയങ്ങൾക്ക് ഉയർന്ന പരിഗണന നൽകുന്നു.
 C. ഇന്ത്യൻ ഭരണഘടനയിൽ അങ്ങനെ വ്യക്തമാക്കിയിരിക്കുന്നു.
 D. ഇന്ത്യയ്ക്ക് ഉയർന്ന വളർച്ചാ നിരക്കുണ്ട്.
33. നാണുപുരപ്പം സാധാരണ ജനങ്ങളെയാണ് ഏറ്റവും കൂടുതൽ ബാധിക്കുന്നത് എന്ന് പറയുന്നത് എന്തുകൊണ്ട് ?
 A. വില വർദ്ധനവ് ഉണ്ടാകുന്നു. B. ലാഭനിരക്ക് വർദ്ധിക്കുന്നു.
 C. ഉല്പാദനം കുറയുന്നു. D. പണ ദൗർലഭ്യം ഉണ്ടാകുന്നു.
65. ബാങ്കുകൾ, ഇൻഷുറൻസ് കമ്പനികൾ, റെയിൽവെ തുടങ്ങിയവയെ തുതീയ മേഖല എന്ന് പറയുന്നതെന്തുകൊണ്ട് ?
 A. അവ സാമ്പത്തിക വികസനത്തിന്റെ അടിസ്ഥാന മേഖലകളാണ്. B. സേവന മേഖലകളാണ്.
 C. അവ പൊതുമേഖലാ സ്ഥാപനങ്ങളാണ് D. മനുഷ്യൻ ഇവ പ്രധാനപ്പെട്ടവയാണ്.
34. ബുദ്ധ-ജൈനമത തത്വങ്ങൾക്ക് നിങ്ങളുടെ ജീവിതത്തിൽ എന്തു സ്വാധീനമാണുള്ളത് ?
 A. അഹിംസയിലും വേദങ്ങളിലുമുള്ള വിശ്വാസം
 B. യാഗങ്ങളിലും അഷ്ടാംഗമാർഗങ്ങളിലുമുള്ള വിശ്വാസം
 C. അഹിംസയിലും സത്കർമ്മങ്ങളിലും അധിഷ്ഠിതമായ ജീവിതം
 D. ദിവസവും ഇന്ദ്രിയ പ്രാർത്ഥനയും പുജയും നടത്തൽ
35. കഥകളിയെക്കുറിച്ച് വിശദമായി മനസ്സിലാക്കാൻ നിങ്ങൾ എന്തുചെയ്യും?
 A. ഭരതമുനിയുടെ നാട്യശാസ്ത്രം വായിക്കും. B. കഥകളിയുടെ അവതരണം പതിവായി കാണും.
 C. കഥകളി മത്സരം സംഘടിപ്പിക്കും. D. കേരള കലാമണ്ഡലത്തിൽ പഠനം നടത്തും.
36. ഒരു ഇന്ത്യൻ പൗരൻ എന്ന നിലയിൽ നിങ്ങളുടെ ചുമതല എങ്ങനെ നിർവ്വഹിക്കും?
 A. എന്റെ മതം എല്ലായിടത്തും പ്രചരിപ്പിക്കും
 B. സ്വതന്ത്രമായി സഞ്ചരിക്കുകയും അഭിപ്രായപ്രകടനം നടത്തുകയും ചെയ്യും.
 C. അവകാശങ്ങൾ ലംഘിക്കപ്പെടുകയാണെങ്കിൽ നിയമ നടപടികൾ സ്വീകരിക്കും.
 D. സ്വന്തം അവകാശങ്ങളോടൊപ്പം മനുജവരുടെ അവകാശങ്ങളെക്കുറിച്ചും ബോധവാനായിരിക്കും.
37. പതിനെട്ട് വയസ്സ് പൂർത്തിയായ ഒരു ഇന്ത്യൻ പൗരൻ പ്രാഥമിക പൗരാവകാശം എങ്ങനെ വിനിയോഗിക്കും?
 A. തെരഞ്ഞെടുപ്പുകളിൽ വോട്ട് ചെയ്യാൻ എല്ലാ പൗരൻമാരെയും പ്രേരിപ്പിക്കും.
 B. തെരഞ്ഞെടുപ്പുകളിൽ സ്വതന്ത്രമായി വോട്ട് ചെയ്യും.
 C. എല്ലാ തെരഞ്ഞെടുപ്പുകളിലും നിർഭയമായി മത്സരിക്കും.
 D. വോട്ട് ചെയ്യുന്നതോടൊപ്പം തെരഞ്ഞെടുപ്പുകളിൽ മത്സരിക്കുകയും ചെയ്യും.

38. ഭാവിയിൽ മനുഷ്യരാശിക്ക് സമുദ്രങ്ങളെ കൂടുതലായി ആശ്രയിക്കേണ്ടിവരുമെന്നതിനാൽ അതിനുവേണ്ടി നിങ്ങൾക്കെന്തുചെയ്യാൻ കഴിയും?
- A. സമുദ്രയുദ്ധങ്ങളിൽ നിന്നും വിട്ടുനിൽക്കൽ. B. ആഴക്കടൽ മത്സ്യബന്ധനം തടയുക.
C. സമുദ്ര മലിനീകരണം തടയുക. D. സമുദ്രത്തിലെ എണ്ണവനം നിരോധിക്കുക.
39. വന്യജീവി സമ്പത്തിന്റെ സംരക്ഷണത്തിന് താഴെ പറയുന്നവയിൽ നിങ്ങൾ ഏതുമാർഗ്ഗം സ്വീകരിക്കും.
- A. വനവൽക്കരണം പ്രോത്സാഹിപ്പിക്കുകയും വനത്തിലേക്കുള്ള അതിക്രമിച്ചു കടക്കൽ ചെറുക്കുകയും ചെയ്യുക. B. മൃഗശാലകൾ നിർമ്മിക്കുക.
C. വന്യജീവികളെ വിദേശത്തുനിന്നും കൊണ്ടുവരിക.
D. വന്യജീവികളെ വേട്ടയാടുന്നത് പ്രോത്സാഹിപ്പിക്കുക.
40. നിങ്ങളുടെ പഞ്ചായത്തിലെ ഹൈസ്കൂളുകളുടെ വിതരണം സംബന്ധിച്ച് ഒരു രൂപരേഖ ആവശ്യമായാൽ നിങ്ങൾ എന്താണ് തയ്യാറാക്കുക?
- A. ഒരു ലഘുമാപക ഭൂപടം B. ഒരു ബൃഹത്മാപക ഭൂപടം.
C. മുഴുവൻ ഹൈസ്കൂളുകളുടേയും ഒരു പട്ടിക. D. മുഴുവൻ ഹൈസ്കൂളുകളുടേയും ചിത്രങ്ങൾ.
41. നിങ്ങൾ ഏകദേശം അഞ്ച് ഹെക്ടർ ഭൂമിയിൽ തെങ്ങ് കൃഷി ചെയ്യാൻ ആഗ്രഹിക്കുന്നുവെന്ന് കരുതുക. കൃഷിചെയ്യാൻ വേണ്ട ദീർഘകാല സാമ്പത്തിക സഹായത്തിന് എന്തു ചെയ്യും?
- A. സഹകരണ ബാങ്കുകളിൽ നിന്നും പ്രസ്താവനയ്ക്ക് എടുക്കും.
B. റിസർവ് ബാങ്കിൽ നിന്നും ദീർഘകാല വായ്പ എടുക്കും.
C. ഭൂവികസന ബാങ്കിൽ നിന്നും ദീർഘകാല വായ്പ എടുക്കും.
D. ഇന്ത്യൻ വ്യവസായ വികസന ബാങ്കിൽ നിന്നും പ്രസ്താവനയ്ക്ക് എടുക്കും.
42. നിങ്ങൾ വാങ്ങിയ ഒരു റേഡിയോ ഏതാനും ദിവസങ്ങൾക്കകം പ്രവർത്തിക്കാതായി എന്നു കരുതുക. നഷ്ടം വകവെച്ചു തരുവാൻ വ്യാപാരി തയ്യാറാവുന്നില്ലെങ്കിൽ നിങ്ങൾ എവിടെയാണ് പരാതിപ്പെടുക?
- A. സംസ്ഥാനതല ഉപഭോക്തൃ സംരക്ഷണ സമിതിയിൽ. B. ജില്ലാകോടതിയിൽ.
C. ഹൈക്കോടതിയിൽ. D. ജില്ലാതല ഉപഭോക്തൃ സംരക്ഷണ സമിതിയിൽ.
43. മനുഷ്യൻ പാർത്തിരുന്ന നദീതീരങ്ങളിൽ പലതരത്തിലുള്ള മൃഗങ്ങളേയും കണ്ടിരിക്കാം. അവയിൽ ചില മൃഗങ്ങളെ അവൻ ഇണക്കി വളർത്താൻ തുടങ്ങി. ഇത് സൂചിപ്പിക്കുന്നതെന്ത്?
- A. മൃഗങ്ങളില്ലാതെ മനുഷ്യൻ ജീവിക്കാൻ സാധിക്കില്ല.
B. മനുഷ്യൻ എല്ലാ മൃഗങ്ങളെയും ഇഷ്ടമാണ്.
C. മൃഗങ്ങളുടെ സ്വഭാവവിശേഷങ്ങൾ നിരീക്ഷിച്ച് മനസ്സിലാക്കാൻ മനുഷ്യന് കഴിയും.
D. മൃഗങ്ങളെ സംരക്ഷിക്കാൻ മനുഷ്യനേ കഴിയൂ.
44. നിരവധി ആവശ്യങ്ങൾക്കായി മനുഷ്യൻ ഭൂമിയെ ഉപയോഗിക്കുമ്പോൾ ഭൂമിയുടെ ആളോഹരി വിഹിതം കുറയുന്നു. ഈ വസ്തുത എന്തിലേക്കാണ് വിരൽ ചൂണ്ടുന്നത്?
- A. പരിമിതമായ ഭൂമിയെ വളരെ ശ്രദ്ധാപൂർവ്വം ഉപയോഗിക്കേണ്ടതാണ്.
B. കാർഷികേതര ആവശ്യങ്ങൾക്കുള്ള ഭൂമിയുടെ ഉപയോഗം ചുരുക്കേണ്ടതാണ്.
C. കാർഷിക ആവശ്യങ്ങൾക്ക് മാത്രം ഉപയോഗിച്ചാൽ ഭൂമിയുടെ ആളോഹരി വിഹിതം വർദ്ധിപ്പിക്കാൻ കഴിയും. D. കാർഷിക ആവശ്യങ്ങൾക്കു മാത്രമേ ഭൂമിയെ ഉപയോഗിക്കാവൂ.
45. കേരളത്തിലെ ഗ്രാമപഞ്ചായത്തുകളുടെ പ്രവർത്തനത്തെ എങ്ങനെ വിശദീകരിക്കാം?
- A. ഗ്രാമങ്ങളുടെ കാർഷിക - വ്യാവസായിക ആവശ്യങ്ങൾ സംരക്ഷിക്കുന്നു.
B. ഗ്രാമീണ ജനതയുടെ ജനാധിപത്യ പൗരാവകാശങ്ങൾ സംരക്ഷിക്കുന്നു.
C. ഗ്രാമങ്ങളിലെ അടിസ്ഥാന ജനാധിപത്യ സ്വയംഭരണ സ്ഥാപനങ്ങളാണ്.
D. ഗ്രാമീണ ജനതയുടെ തൊഴിലില്ലായ്മ പരിഹരിക്കുന്ന സ്വയംഭരണ സ്ഥാപനങ്ങളാണ്.
46. ഇന്ത്യയിൽ ജനങ്ങളുടെ ജീവനും സ്വത്തിനും സംരക്ഷണം നൽകുക എന്നത് സംസ്ഥാന ഗവൺമെന്റുകളുടെ മുഖ്യ ചുമതലയാണെന്നതിന്റെ അടിസ്ഥാനം എന്താണ്?
- A. പോലീസ് സേനയുടെ മികച്ച ഉപയോഗം സംസ്ഥാന ഗവൺമെന്റുകൾക്ക് മാത്രം സാധ്യമാകുന്നു.
B. ജനങ്ങളുമായി അടുത്ത് ഇടപഴകാൻ കഴിയുമെന്നതിനാൽ ക്രമസമാധാനം സംസ്ഥാന ഗവൺമെന്റുകൾ നിർവ്വഹിക്കേണ്ടതാണ്.
C. ഇന്ത്യയിൽ പോലീസ് സേനകൾ സംസ്ഥാന ഗവൺമെന്റുകൾക്ക് മാത്രമുള്ളതാണ്.
D. ഭരണഘടന അനുസരിച്ച് ക്രമസമാധാനപാലന ചുമതല സംസ്ഥാന ഗവൺമെന്റുകൾക്കാണ്.
47. പല വികസന രാജ്യങ്ങളിലും മരക്കലപ്പയും കാളയും ഉപയോഗിച്ചാണ് നിലമുഴുന്നത്. എന്നാൽ വികസിത രാജ്യങ്ങളിൽ ആധുനിക യന്ത്രങ്ങളും ഉപകരണങ്ങളുമാണ് ഉപയോഗിക്കുന്നത്. ഈ വ്യത്യാസത്തെ എങ്ങനെ വിശദീകരിക്കാം?
- A. വികസന രാജ്യങ്ങളിൽ പഴക്കം ചെന്ന ഉൽപ്പാദനരീതികളും ഉപകരണങ്ങളുമാണ് ഉപയോഗിക്കുന്നത്.
B. വികസിത രാജ്യങ്ങളിൽ എല്ലാ ഉൽപ്പാദന പ്രവർത്തനങ്ങളിലും യന്ത്രങ്ങൾ അത്യാവശ്യമാണ്.
C. വികസന രാജ്യങ്ങളിലെ ഉൽപ്പാദന പ്രവർത്തനങ്ങളിൽ ആധുനിക യന്ത്രങ്ങളും ഉപകരണങ്ങളും ആവശ്യമില്ല. D. വികസിത രാജ്യങ്ങളിൽ ആധുനിക യന്ത്രസാമഗ്രികൾ ഉപയോഗിക്കുന്നു എന്നതുകൊണ്ടാണ് വ്യത്യാസം.

48. ആസൂത്രണക്കമ്മീഷൻ രാജ്യത്തിന്റെ ദേശീയവരുമാനത്തെ സ്വാധീനിക്കുന്ന ഘടകങ്ങളെക്കുറിച്ച് പഠിക്കുന്നു. ഇതുകൊണ്ട് എന്താണ് ഉദ്ദേശിക്കുന്നത് ?
- A. ദേശീയ വരുമാനത്തെ അടിസ്ഥാനമാക്കിയുള്ള പദ്ധതികൾ ആസൂത്രണം ചെയ്യുക.
 - B. ദേശീയ വരുമാനം നിർണ്ണയിക്കുന്നതിൽ പഞ്ചവത്സര പദ്ധതികളുടെ പങ്ക് കണ്ടെത്തുക.
 - C. ദേശീയ വരുമാനം വർദ്ധിപ്പിക്കത്തക്കവണ്ണം പദ്ധതികൾ ആസൂത്രണം ചെയ്യുക.
 - D. ദേശീയ വരുമാനവും സാമ്പത്തിക വളർച്ചയും തമ്മിലുള്ള പരസ്പര ബന്ധം കണ്ടെത്തുക
49. സിന്ധു നദീതട സംസ്കാരത്തിന്റെ അവശിഷ്ടങ്ങൾ ഹാരപ്പ, മോഹഞ്ചാദാരോ, പഞ്ചാബിലെ രൂപാർ, രാജസ്ഥാനിലെ കാലിബങ്കൻ, ഗുജറാത്തിലെ ലോത്തൽ, ഹരയാനയിലെ ബനാവലി എന്നിവിടങ്ങളിൽ നിന്നാണ് കണ്ടു കിട്ടിയത്. ഇതിൽ നിന്നും നിങ്ങൾക്ക് എന്ത് കണ്ടെത്താൻ കഴിയും?
- A. ഈ സംസ്കാരം ഒരു വിശാലമായ പ്രദേശത്ത് വ്യാപിച്ച് കിടന്നതും ഭാരത സംസ്കാരത്തിന് അടിത്തറ പാകിയതുമാണ്.
 - B. ഇത് മറ്റ് സംസ്കാരങ്ങളേക്കാൾ പുരോഗമിച്ചതും വളരെ നാൾ നിലനിന്നതുമായിരുന്നു.
 - C. ഇത് നിരവധി സ്ഥലങ്ങളിലായി വെറുറെ നിലവിൽ വന്ന സംസ്കാരമായിരുന്നു.
 - D. ഇവിടുത്തെ ജനങ്ങളെ ശത്രുക്കൾ നിരന്തരം ആക്രമിച്ചതിനാൽ സംസ്കാരം അധഃപതിച്ചു.
50. പ്രകൃതി ശക്തികളിൽ വിശ്വസിച്ചിരുന്ന ആര്യന്മാർ ഇന്ദ്രൻ, വരുണൻ, സൂര്യൻ തുടങ്ങിയ ദേവൻ മാരെ ആരാധിച്ചിരുന്നു. ഇതിൽ നിന്നും നിങ്ങൾ കണ്ടെത്തുന്ന വസ്തുതയെന്ത് ?
- A. പ്രകൃതി ശക്തികളെ മാത്രമാണ് ആര്യന്മാർ ആരാധിച്ചിരുന്നത്
 - B. ഇന്ദ്രൻ, വരുണൻ, സൂര്യൻ എന്നിവ മാത്രമാണ് പ്രകൃതി ശക്തികൾ
 - C. പ്രകൃതി ശക്തികൾക്കായി ആര്യന്മാർ നിരവധി ക്ഷേത്രങ്ങൾ പണികഴിപ്പിച്ചു.
 - D. ആര്യന്മാർ ബഹുദൈവ വിശ്വാസികൾ ആയിരുന്നു.
51. ഭൗമോപരിതലത്തിൽ 71 ശതമാനത്തോളം മൂടപ്പെട്ടിരിക്കുന്ന ജലം ധ്രുവപ്രദേശങ്ങളിൽ മഞ്ഞുകട്ടയായും അന്തരീക്ഷത്തിൽ നീരാവിയായും ജലാശയങ്ങളിൽ ദ്രാവകരൂപത്തിലും കാണപ്പെടുന്നു. ഇതിൽ നിന്നും നിങ്ങൾ കണ്ടെത്തുന്ന വസ്തുതയെന്ത്?
- A. ജലത്തിന് ഖരം, ദ്രവം, വാതകം എന്നീ മൂന്നവസ്ഥകളിലും സ്ഥിതിചെയ്യാൻ കഴിയും.
 - B. ജലം മൂന്നവസ്ഥകളിലും കാണപ്പെടുന്നതുകൊണ്ടാണ് ജീവജാലങ്ങൾ നിലനിൽക്കുന്നത്.
 - C. ഭൗമോപരിതലത്തിലെ ജലത്തിന്റെ അളവ് 71 % ആയതിനാൽ അത് മൂന്നവസ്ഥകളിൽ സ്ഥിതിചെയ്യുന്നു.
 - D. ജലത്തിന് മൂന്ന് അവസ്ഥകളിൽ സ്ഥിതി ചെയ്യാൻ കഴിയുന്നതുകൊണ്ട് ഭൗമോപരിതലത്തിൽ അതിന്റെ അളവ് 71 % ആണ്.
52. ഇന്ത്യൻ പ്രസിഡന്റ് തന്റെ അധികാരങ്ങൾ വിനിയോഗിക്കുന്നത് പ്രധാനമന്ത്രിയുടെയും മന്ത്രിസഭയുടെയും ഉപദേശമനുസരിച്ചാണ്. ഇതിൽ നിന്നും നിങ്ങൾ എന്ത് നിഗമനത്തിൽ എത്തിച്ചേരുന്നു?
- A. പ്രസിഡന്റ് പരമാധികാരിയാണെങ്കിലും നിർവ്വഹണാധികാരമില്ല.
 - B. സ്വന്തം നിലയിൽ പ്രവർത്തിച്ചാൽ പ്രസിഡന്റിനെ ഇംപീച്ച് ചെയ്യും.
 - C. പ്രസിഡന്റിന്റെ അധികാരങ്ങൾ ഇന്ത്യൻ ഭരണഘടനയാൽ നിയന്ത്രിക്കപ്പെട്ടിരിക്കുന്നു.
 - D. പ്രസിഡന്റ് സ്വന്തം നിലയിൽ പ്രവർത്തിച്ചാൽ ഭരണഘടനാ പ്രതിസന്ധിയുണ്ടാകും.
53. മുതലാളിത്ത സമ്പദ് വ്യവസ്ഥയുടെ പ്രധാന ന്യൂനതകളാണ് ലാഭോരയോടെയുള്ള പ്രവർത്തനങ്ങൾ, കിടമത്സരങ്ങൾ കൊണ്ടുള്ള പാഴ്ചെലവ്, സ്വകാര്യസ്വത്തിനുള്ള പ്രാമുഖ്യം തുടങ്ങിയവ. ഇതിൽനിന്നും നിങ്ങൾ കണ്ടെത്തുന്ന വസ്തുതയെന്ത്?
- A. ഇന്ത്യ പോലുള്ള ഒരു വികസന രാജ്യത്തിന് ഏറ്റവും അനുയോജ്യം മുതലാളിത്തമാണ്.
 - B. ഇന്ത്യ പോലുള്ള ഒരു വികസന രാജ്യത്തിന് ഏറ്റവും അനുയോജ്യം ഒരു മിശ്രസമ്പദ് വ്യവസ്ഥയാണ്.
 - C. ഉയർന്ന സാമ്പത്തിക വളർച്ച നേടാൻ ഇന്ത്യയ്ക്ക് ഏറ്റവും ഉചിതം മുതലാളിത്ത വ്യവസ്ഥിതിയാണ്.
 - D. ഇന്ത്യയിലെ ദാരിദ്ര്യവും തൊഴിലില്ലായ്മയും പരിഹരിക്കാൻ മുതലാളിത്ത വ്യവസ്ഥിതി ആവശ്യമാണ്.
54. വിഭവങ്ങളുടെ അപര്യാപ്തമായ വിനിയോഗം, മൂലധനത്തിന്റെ അഭാവം, ഉയർന്ന ജനസംഖ്യ വളർച്ചാ നിരക്ക് തുടങ്ങിയവ ഇന്ത്യൻ സമ്പദ് വ്യവസ്ഥയുടെ ലക്ഷണങ്ങളാണ്. ഇത് ഏത് തരം സമ്പദ് വ്യവസ്ഥയ്ക്ക് ഉദാഹരണമാണ് ?
- A. വികസന സമ്പദ് വ്യവസ്ഥ. B. മുതലാളിത്ത സമ്പദ് വ്യവസ്ഥ.
 - C. വികസിത സമ്പദ് വ്യവസ്ഥ. D. മിശ്രസമ്പദ് വ്യവസ്ഥ.

55. ഈജിപ്തിലെ സംസ്കാരത്തെക്കാൾ സിന്ധുനദീതടസംസ്കാരമാണ് ആഴത്തിൽ വേരുന്നിയത് എന്ന് നിങ്ങൾ വിലയിരുത്തുന്നുവെങ്കിൽ അതിനടിസ്ഥാനമെന്ത് ?
- ആധുനിക ഭാരത സംസ്കാരത്തിന് അടിത്തറപാകാൻ സിന്ധുനദീതട സംസ്കാരത്തിന് സാധിച്ചു.
 - സിന്ധുനദീതടത്തിലെ ജനങ്ങൾ ഈജിപ്തിലെ ജനങ്ങളെക്കാൾ മികച്ച നഗരാസൂത്രണം നടത്തി.
 - ഈ സംസ്കാരം ഈജിപ്ത് സംസ്കാരത്തെക്കാൾ കൂടുതൽകാലം നിലനിന്നു.
 - ഗ്രേറ്റ് ബാത്തിന്റെ അവശിഷ്ടങ്ങൾ കണ്ടെത്തിയിരിക്കുന്നത് സിന്ധുനദീതടത്തിൽ മാത്രമാണ്.
56. ജപ്പാനിൽ കർഷകരുടെമേൽ കനത്ത നികുതി ചുമത്തിയപ്പോൾ കൃഷിക്കാർ ഭൂമി തരിശിട്ടു. അതുകൊണ്ട് ഗവൺമെന്റ് ഭൂമി പുനർവിഭജനം ചെയ്ത് 'സുമറായ്' എന്നറിയപ്പെടുന്ന യോദ്ധാക്കൾക്ക് നൽകി. ഈ നടപടിയെ നിങ്ങൾ എങ്ങനെ വിലയിരുത്തുന്നു ?
- ഗവൺമെന്റിന് ഇതല്ലാതെ മറ്റ് മാർഗ്ഗമില്ല.
 - കാർഷിക മേഖലയിലെ യഥാർത്ഥ ഉൽപാദകരായ കർഷകരെ ദ്രോഹിക്കുന്നതാണ് ഈ നടപടി.
 - കർഷകർ ഉൽപാദനം വർദ്ധിപ്പിച്ച് നികുതി കൃത്യമായി അടക്കണമായിരുന്നു.
 - കർഷകർക്ക് ഇത് ദ്രോഹകരമാണെങ്കിലും സുമറായിമാർക്ക് ഗുണകരമാണ്.
57. മതനവീകരണ കാലഘട്ടത്തിൽ കൃസ്തുമതസഭ മതനിഷേധത്തിനുള്ള ശിക്ഷകൾ നിർബന്ധമാക്കുകയും സഭാനിയമങ്ങൾ അനുസരിക്കാത്തവരെ മതദ്രഷ്ടരാക്കുകയും ചെയ്തു. പോപ്പിന്റെ ഈ പ്രവർത്തിയെ നിങ്ങൾ എങ്ങനെ വിലയിരുത്തുന്നു ?
- പോപ്പ് തന്റെ ചുമതലകൾ കൃത്യമായി നിർവ്വഹിക്കുന്നതിൽ വിജയിച്ചു.
 - പോപ്പിന്റെ ഈ നടപടികൾ അത്യാവശ്യമാണെങ്കിലും ഒഴിവാക്കാനായിരുന്നു.
 - ഈ നടപടികൾ കൃസ്തുമതസഭയുടെ ഐക്യത്തിന് ചേർന്നതായിരുന്നില്ല.
 - ആ കാലഘട്ടത്തിൽ ഈ നടപടികൾ ആവശ്യവും ഒഴിവാക്കാനാവാത്തതുമായിരുന്നു.
58. ഒരു ആവാസവ്യവസ്ഥയിൽ ജീവിയ വിഭാഗത്തോടൊപ്പം അജീവിയ വസ്തുക്കളും ഉൾപ്പെടുന്നു. ഇതിന്റെ അടിസ്ഥാനത്തിൽ ഒരു ആവാസവ്യവസ്ഥയുടെ പ്രവർത്തനം വിലയിരുത്തുക.
- ജീവിയ വിഭാഗം സ്വയംസഹായ സമുദായങ്ങളാവുകയാണെങ്കിൽ അജീവിയ ഘടകങ്ങളെ ആശ്രയിക്കേണ്ടതില്ല.
 - ജീവിയ വിഭാഗം സ്വയംസഹായ സമുദായങ്ങളാകുന്നതോടൊപ്പം അജീവിയ ഘടകങ്ങളെ ആശ്രയിക്കുന്നു.
 - ജീവിയ വിഭാഗത്തിന് ആഹാരത്തിന്റെ കാര്യത്തിലൊഴികെ അജീവിയ ഘടകങ്ങളെ ആശ്രയിക്കേണ്ടതില്ല.
 - അജീവിയ ഘടകങ്ങൾക്ക് ജീവിയ വിഭാഗത്തേക്കാൾ പ്രധാന്യം കുറവാണ്.
59. ഇന്ത്യയിലെ ഭൂരിഭാഗം ജനങ്ങളും അധിവസിക്കുന്ന ഗ്രാമങ്ങളുടെ അഭിവൃദ്ധിക്ക് തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങളെ ഫലപ്രദമായി പ്രയോജനപ്പെടുത്തണം എന്ന് ഗാന്ധിജി അഭിപ്രായപ്പെട്ടു. ഗാന്ധിജിയുടെ ഈ വാദഗതി നിങ്ങൾ എങ്ങനെ വിലയിരുത്തുന്നു?
- തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങൾ ഇല്ലെങ്കിൽ ഗ്രാമങ്ങൾക്ക് അഭിവൃദ്ധി ഉണ്ടാകില്ല എന്ന് ഗാന്ധിജി വിശ്വസിച്ചു.
 - ഇന്ത്യൻ ഗ്രാമങ്ങളെ അടുത്തറിഞ്ഞ ഗാന്ധിജിയുടെ പ്രായോഗിക ബുദ്ധിയാണ് ഇത് കാണിക്കുന്നത്.
 - ഗ്രാമീണ ജനതയിൽ ജനാധിപത്യബോധം ഉണ്ടാക്കാൻ ഇത് ആവശ്യമാണെന്ന് ഗാന്ധിജി കരുതി.
 - ഇന്ത്യൻ ജനാധിപത്യത്തിന്റെ അടിത്തറ തദ്ദേശ സ്വയംഭരണ സ്ഥാപനങ്ങളിലാണ് എന്ന് ഗാന്ധിജി വിശ്വസിച്ചു.
60. ഇന്ത്യയിൽ രാജ്യരക്ഷ, റെയിൽവെ, അണുശക്തി തുടങ്ങിയവ കേന്ദ്രഗവൺമെന്റിന്റെയും ക്രമസമാധാനം, കൃഷി, പൊതുജനാരോഗ്യം തുടങ്ങിയവ സംസ്ഥാനഗവൺമെന്റുകളുടെയും അധികാര പരിധിയിൽ വരുന്നു. ഇത്തരത്തിലുള്ള അധികാരം പങ്കുവെക്കലിനെ നിങ്ങൾ എങ്ങനെ വീക്ഷിക്കുന്നു?
- ഇന്ത്യപോലുള്ള ഒരു വിശാലമായ രാജ്യത്ത് അധികാരങ്ങൾ പങ്കുവെക്കുന്ന ഫെഡറൽ സമ്പ്രദായം ഫലപ്രദമാണ്.
 - ഇന്ത്യയിൽ ഫെഡറൽ സമ്പ്രദായം പ്രയോജനകരമാണെങ്കിലും അധികാരങ്ങൾ പങ്കുവെക്കുന്നത് ഫലപ്രദമല്ല.
 - ദേശീയ ഐക്യത്തിനുവേണ്ടി എല്ലാ പ്രധാന അധികാരങ്ങളും കേന്ദ്രഗവൺമെന്റിൽ കേന്ദ്രീകരിക്കുന്നതാണ് ഉചിതം.
 - പ്രാദേശിക സ്വയംഭരണം സാധ്യമാക്കാൻ എല്ലാ പ്രധാന അധികാരങ്ങളും സംസ്ഥാനങ്ങൾക്ക് നൽകേണ്ടതാണ്.

Appendix VI -A
UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION
ACHIEVEMENT TEST IN SOCIAL SCIENCES
RESPONSE SHEET (Final)

വിദ്യാർത്ഥിയുടെ പേര്

വയസ്സ്

ക്ലാസ്സ്

ക്ലാസ്സ് നമ്പർ

ആൺകുട്ടി / പെൺകുട്ടി

നമ്പർ		നമ്പർ		നമ്പർ	
1	A B C D	21	A B C D	41	A B C D
2	A B C D	22	A B C D	42	A B C D
3	A B C D	23	A B C D	43	A B C D
4	A B C D	24	A B C D	44	A B C D
5	A B C D	25	A B C D	45	A B C D
6	A B C D	26	A B C D	46	A B C D
7	A B C D	27	A B C D	47	A B C D
8	A B C D	28	A B C D	48	A B C D
9	A B C D	29	A B C D	49	A B C D
10	A B C D	30	A B C D	50	A B C D
11	A B C D	31	A B C D	51	A B C D
12	A B C D	32	A B C D	52	A B C D
13	A B C D	33	A B C D	53	A B C D
14	A B C D	34	A B C D	54	A B C D
15	A B C D	35	A B C D	55	A B C D
16	A B C D	36	A B C D	56	A B C D
17	A B C D	37	A B C D	57	A B C D
18	A B C D	38	A B C D	58	A B C D
19	A B C D	39	A B C D	59	A B C D
20	A B C D	40	A B C D	60	A B C D

Appendix VI B

UNIVERSITY OF CALICUT DEPARTMENT OF EDUCATION

Achievement Test in Social Sciences for Secondary School Pupils (Final)

Dr. P.K. Sudheesh Kumar
&
K.K. Shanmugha Das

Instructions:

This is an Achievement Test in Social Sciences. Four possible answers are given for each question in the order A, B, C, D. One of them is correct. Find out the correct answer. Separate answer sheet is given in which letters A, B, C, D are marked against each question number. Mark your correct answer in the answer sheet by putting X mark on the letter that stands for the correct answer. In case you have marked X at a wrong place draw a circle around it ⊗ and mark for the correct answer. Don't forget to mark your answer to all questions.

Example:

1. Where is the capital of India?

A. Thiruvananthapuram B. Mumbai C. New Delhi D. Kolkata

Qn. No. 1

		X	
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1. Name the alphabet used by Ancient Egyptians

A. Cuneiform B. Teracotta C. Arabic D. Hieroglyphics

2. Who of the following was the famous Greek poet?

A. Herodotus B. Sophocles C. Homer D. Aristotle

3. Which is the lower most layer of Atmosphere?

A. Troposphere B. Heterosphere C. Stratosphere D. Ionosphere

4. Which equipment is used to measure atmospheric pressure?

A. Thermometer B. Ammeter C. Barometer D. Hygrometer

5. What is the name of North equatorial current along the east coast of Asia?

A. Oyashio B. Humboldt cold current

C. British Columbia current D. Kuroshio

6. Which part of the sea is most appropriate for the growth of plants and animals?
A. Abyssal plain B. Continental shelf
C. Sea mounts D. Continental rise
7. Which of the following is non-renewable resource?
A. Fish B. Forest C. Coal D. Water
8. Which is the home state of Bharatha Natya?
A. Andhra Pradesh B. Kerala
C. Maharashtra D. Tamil Nadu
9. The Olympic game was started to honour which of the following gods?
A. Zeus B. Appolo C. Poseiden D. Pericles
10. What an economy that works on private property is called?
A. Capitalism B. Socialism
C. Developing economy D. Mixed economy
11. Name the Central Bank of India
A. State Bank of India B. Industrial Development Bank of India
C. Reserve Bank of India D. Union Bank of India
12. What is the reward for organisation?
A. Wages B. Interest C. Lease D. Profit
13. What led to the permanent settlement of man in Neolithic Age?
A. To make food production and cattle rearing easy.
B. To defeat enemies C. To make the governance easy
D. For easy hunting
14. The main defect of Mesopotamian calendar was that it was based on one of the following. What is that?
A. Sun B. Months C. Moon D. Earth
15. What was the remarkable achievement of Egyptian civilization?
A. Socio-economic development B. Agro-Industrial Development
C. Better defence systems D. Achievement in Architecture
16. What type of places are suitable for the emergence of civilizations?
A. Coastal areas B. River valleys C. Plateaus D. Plains
17. In ancient China there were carvings of Lotus, Dargon and Horse. What does it indicate?
A. They were worshipped B. Belief in Taoism
C. Excellence in architecture D. Existence of pictograph

18. After the arrival of Moses what change took place in the religious belief of Jews?
A. Believed a variety of gods. B. Believed in Jesus
C. Believed as the 'Chosen People' D. Believed in one god
19. Why it is said that Muslims believe in life after death?
A. They perform post-death rites B. Believe that all men shall receive rewards for their earthly actions C. The other religions believe so
D. Adorn neat dress on dead bodies.
20. Why was Latin language considered as the vehicle of Medieval European culture?
A. Then Latin was the only language used B. Believed that Latin was the most suitable language. C. Latin was the ancient language of Romans.
D. Latin was widely used in cultural and literal activities
21. What are the main principles of Buddhism and Jainism?
A. Prayer and belief in God B. Non-violence and purity of Karma
C. Sacrifices and rituals D. Idol worship and monasticism
22. The coins issued by Kanishka had pictures of gods of different communities. What does it show?
A. He believed in many gods. B. His coins were used by all
C. He respected all religions. D. His period was rich and splendid.
23. A responsible citizen is a person with one of the following characteristics. What is that?
A. Gives importance to duties than rights. B. Does his duties besides enjoying rights. C. Obays all the laws. D. Dedicated himself to the country.
24. What is the basic responsibility of a Panchayath?
A. Working for the socio-economic development of the village.
B. Involving all villagers in the administration
C. Assuring equality of opportunities to all villagers.
D. Conducting timely election to its administrative body.
25. Why India is treated a secular nation?
A. No freedom to believe in a single religion and to preach it.
B. There is freedom to believe in a particular religion and to preach it.
C. There is freedom to believe in any religion and to preach it.
D. No religious belief is allowed.
26. Why earth is called a 'wateryplanet'?
A. 71% of earth's surface is covered by water. B. There is good rainfall
C. Water occurs in different forms D. There are number of oceans on earth.

27. How the presence of Ionosphere is useful to mankind?
A. For weather forecast B. For short distant radio transmission
C. For long distant radio transmission D. To find out ultraviolet rays.
28. Why the polar regions are under high pressure?
A. There is no human inhabitation. B. They are extremely cold regions.
C. They are high altitude regions. D. There is shortage of air.
29. Why the decomposers are called the saniters of earth?
A. Preserving dead organisms B. Decomposing dead organisms
C. Decomposing bacteria and fungi D. Preserving bacteria and fungi
30. Which of the following is the speciality of Pacific Ocean?
A. Good climate B. Deepest and vast
C. Number of trenches D. Number of cold currents
31. Coal is called a fossil fuel. What do you mean by this?
A. Man has been using it for many years. B. Coal is very important to organisms.
C. Plants require coal and solar energy.
D. It is the energy stored by plants long ago.
32. Why India is called a mixed economy?
A. . It carries good features of both capitalism and socialism.
B. High priority to socialist ideas.
C. It is stated in the constitution. D. India has high growth rate.
33. Why inflation causes great hardship to common people?
A. It leads to price rise. B. Rate of profit increases.
C. Level of production falls. D. Fall in money supply.
34. What is the role of Buddhism and Jainism in your life?
A. Belief in non-violence and Vedas B. Belief in sacrifices and eight fold paths
C. A life based on non-violence and purified 'karma'
D. Daily worship and rites.
35. What will you do to learn more about 'Kathakali'
A. Reading the 'Natyasastra' of Bharatamuni B. Seeing the performance of Kathakali
C. Conducting Kathakali competition
D. Studying in Kerala Kalamandalam.
36. As a responsible citizen of the country which of the following is your duty?
A. Preaching my religion everywhere B. Travelling freely and expressing my opinion
C. Taking legal action if rights are violated
D. Conscious of rights of others while enjoying my rights.

37. How an Indian citizen with 18 years will exercise his primary democratic right?
 A. Persuading all citizens to vote in elections. B. Freely exercising the right to vote.
 C. Freely contesting in all elections.
 D. Besides voting contesting in elections.
38. What effort you will make considering the fact that man may have to depend more on oceans in the future?
 A. Desisting from sea wars. B. Preventing deep sea fishing.
 C. Preventing sea pollution. D. Abolishing oil excavation in sea.
39. For the conservation of wild life which of the following you will adopt?
 A. Encouraging afforestation and preventing trespassing to forests.
 B. Construction of Zoos C. Bringing wild animals from abroad
 D. Encouraging hunting.
40. If you are asked to prepare a map showing the distribution of High Schools in your Panchayath which of the following you will prepare?
 A. A large scale map. B. A small scale map.
 C. A list of all High Schools. D. Pictures of all High Schools.
41. Suppose you like to cultivate coconut trees on five hectares of land what agricultural credit you will take?
 A. Short term loan from a co-operative bank. B. Long term loan from Central Bank.
 C. Long term loan from Land Development Bank.
 D. Short term loan from Industrial Development Bank of India.
42. Suppose your new radio is not working well and the seller is not ready to give compensation. To protect your interest where will you complain?
 A. In State consumer protection forum. B. In district court.
 C. In High Court. D. In district consumer protection forum.
43. Man might see number of animals on river banks where he settled. Some of them were domesticated by him. What does this show?
 A. Man cannot live without animals. B. Man likes all animals.
 C. Man can understand the specialities of animals.
 D. Only man can protect animals.
44. When land is used for different purposes its per-capita availability decreases. What does it indicate?
 A. Prudent use of land is inevitable. B. Using the land for non-agrarian purposes should be restricted.
 C. If used only for agrarian purposes its per-capita availability can be increased. D. Land should be used only for agrarian purposes.
45. How do you describe the functioning of village panchayats in Kerala?
 A. Protecting the agro-industrial requirements of villages. B. Protecting the democratic and civic rights of villagers.
 C. Basic democratic and self governing

- bodies of villages. D. Self governing bodies that irradiate unemployment of villagers.
46. In India protecting the life and property of people is an important responsibility of state governments. What does it imply?
- A. Only state governments can effectively utilise the police force. B. As the state government has close contact with the people law and order is its responsibility. C. In India only state governments can form the police force. D. As per the constitution law and order is the responsibility of state governments.
47. In most of the developing countries wooden plough and bullocks are used for ploughing the land, but in developed countries modern machinery and techniques are used. How do you explain this situation?
- A. In developing countries primitive techniques of production are used. B. In developed countries machinery is used in all productive activities. C. In developing countries modern machinery and techniques are not needed in productive activities. D. The only difference is that in developed countries modern machinery and equipments are used.
48. The Planning Commission study the factors affecting national income of the country and evaluate the functioning of the economy. What is meant by this?
- A. To plan on the basis of country's national income. B. To find out the role of Five Year Plans in national income. C. To plan in such a way as to raise the national income. D. To find out the relationship between national income and economic growth.
49. The evidences of Indus Valley Civilization are found in Mohenjodaro, Harappa, Rupar in Punjab, Kalibangan in Rajasthan, Lothal in Gujarat and Banawali in Haryana. What do you conclude from this?
- A. This civilization was spread over a vast area and laid foundation for India's culture. B. It was a more developed civilization than others and continued for long time. C. It arose separately in different places. D. It declined because of the continuous attack of enemies.
50. Aryans worshipped natural phenomena like Indra, Varuna and Surya as Gods. What do you find out from this?
- A. Aryans worshipped only the natural powers. B. The natural powers are only Indra, Varuna and Surya. C. Aryans built number of temples for the natural phenomena. D. Aryans believed a variety of gods.
51. Water that forms 71% of earth's surface exists in the form of ice in polar regions, water-vapour in the atmosphere and in liquid form under the surface of earth. What concept do you find out here?
- A. Water can occur in three forms like solid, liquid and gas. B. The organisms exist because water occurs in three forms. C. As 71% of earth's surface consists of water it occurs in three forms. D. As water occurs in three forms 71% of earth's surface consists of water.

52. The President of India exercises his powers on the advice of the Prime Minister and the Council of Ministers. What do you conclude from this?
A. Though President is the Constitutional Head he has no executive powers. B. If President worked independently he will be impeached. C. The powers of the President are controlled by the constitution of India. D. If the President worked independently there will be constitutional dead-lock.
53. Working on profit motive, wastage of competition, prominence to private property are the main defects of capitalism. What do you find out from this?
A. In a developing country like India capitalism is the most suitable system. B. In a developing country like India mixed economy is the most suitable system. C. For achieving high growth rate India needs capitalist system. D. In order to solve the problem of poverty and unemployment India needs capitalist system.
54. Under utilisation of resources, shortage of capital, high growth rate of population are the features of Indian economy. It shows that Indian economy is an example for one of the following economies. Choose it.
A. Developing economy B. Capitalist economy.
C. Developed economy D. Mixed economy.
55. If you evaluate that Indus valley civilization was much deeper rooted than Egyptian civilization what is the basis of it?
A. Indus valley civilization laid the foundation for modern Indian culture. B. People of Indus valley had better town planning than Egyptians. C. This civilization lasted a longer period than Egyptian civilization. D. The remnants of great bath were excavated at Indus valley only.
56. In Japan due to heavy burden of taxation peasants deserted the lands. So the government redistributed the land to samurai or warriors. How do you evaluate this incident?
A. Government had no other option. B. It was harmful to peasants who are the real producers in the farm sector. C. Peasants should have paid the tax by raising the output. D. Though it was harmful to peasants samurais benefited by it.
57. During the period of reformation catholic church made punishment obligatory and excommunicated those who defied the church. How do you evaluate these measures taken by Pope?
A. Pope was successful in discharging his duties. B. Though these measures were essential it could be avoided. C. These measures were not conducive to the unity of the church. D. These measures during that period were essential and unavoidable.
58. Habitats comprise not only living beings but a number of non-living elements also. On the basis of it evaluate the functioning of a habitat?
A. If living beings form self-supporting communities they need not depend on non-living elements. B. The living beings depend on non-living elements and form self-supporting communities. C. The living beings need not depend on

non-living elements except for food. D. The importance of non-living elements is less than that of living beings.

59. According to Gandhiji Local Self Governments should be effectively utilised for the all round development of villages where most Indians live. How do you evaluate Gandhiji's view?

A. Gandhiji believed that villages cannot progress in the absence of Local Self Governments. B. It shows the practical sense of Gandhiji who had close contact with Indian villages. C. Gandhiji thought that it is required to develop a democratic sense among the villagers. D. Gandhiji believed that the success of Indian democracy depends on Local Self Governments.

60. In India defence, railways, atomic energy etc. are included in the Union List and law and order, public health, agriculture etc. are in the State List. How do you evaluate this type of power sharing.

A. In a vast nation like India a federal system of power sharing is effective. B. Though the federal system is useful, the power sharing is not effective. C. For national unity it is better to give all major powers to the central government. D. For achieving regional autonomy all major powers should be given to state governments.

Appendix VI C

UNIVERSITY OF CALICUT DEPARTMENT OF EDUCATION

Achievement Test in Social Sciences for Secondary School Pupils

(FINAL)

RESPONSE SHEET

Name of Student Age:
Class : Class No.: Girl/Boy

Qn. No.					Qn. No.					Qn. No.				
1	A	B	C	D	21	A	B	C	D	41	A	B	C	D
2	A	B	C	D	22	A	B	C	D	42	A	B	C	D
3	A	B	C	D	23	A	B	C	D	43	A	B	C	D
4	A	B	C	D	24	A	B	C	D	44	A	B	C	D
5	A	B	C	D	25	A	B	C	D	45	A	B	C	D
6	A	B	C	D	26	A	B	C	D	46	A	B	C	D
7	A	B	C	D	27	A	B	C	D	47	A	B	C	D
8	A	B	C	D	28	A	B	C	D	48	A	B	C	D
9	A	B	C	D	29	A	B	C	D	49	A	B	C	D
10	A	B	C	D	30	A	B	C	D	50	A	B	C	D
11	A	B	C	D	31	A	B	C	D	51	A	B	C	D
12	A	B	C	D	32	A	B	C	D	52	A	B	C	D
13	A	B	C	D	33	A	B	C	D	53	A	B	C	D
14	A	B	C	D	34	A	B	C	D	54	A	B	C	D
15	A	B	C	D	35	A	B	C	D	55	A	B	C	D
16	A	B	C	D	36	A	B	C	D	56	A	B	C	D
17	A	B	C	D	37	A	B	C	D	57	A	B	C	D
18	A	B	C	D	38	A	B	C	D	58	A	B	C	D
19	A	B	C	D	39	A	B	C	D	59	A	B	C	D
20	A	B	C	D	40	A	B	C	D	60	A	B	C	D

Appendix VI D

Achievement Test in Social Sciences for Secondary School Pupils (Final)

Scoring Key

Qn. No.	Answer
1	D
2	C
3	A
4	C
5	D
6	B
7	C
8	D
9	A
10	A
11	C
12	D
13	A
14	C
15	D
16	B
17	C
18	D
19	B
20	D

Qn. No.	Answer
21	B
22	C
23	B
24	A
25	C
26	A
27	C
28	B
29	B
30	B
31	D
32	A
33	A
34	C
35	D
36	D
37	B
38	C
39	A
40	B

Qn. No.	Answer
41	C
42	D
43	C
44	A
45	C
46	D
47	A
48	C
49	A
50	D
51	A
52	C
53	B
54	A
55	A
56	B
57	C
58	B
59	B
60	A



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