TEACHER STYLES, CLASSROOM ENVIRONMENT AND LEARNING STRATEGIES : A STUDY OF SENIOR SECONDARY STUDENTS IN WEST BENGAL

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DECLARATION

Certified that the dissertation entitled "TEACHER STYLES, CLASSROOM ENVIRONMENT AND LEARNING STRATEGIES : A STUDY OF SENIOR SECONDARY STUDENTS IN WEST BENGAL", submitted by Malaykumar Sen is in partial fulfilment of eight credits out of a total requirement of twentyfour credits for the degree of Master of Philosophy of this University. This dissertation has not been submitted for any other degree of this University, or any other university, and is his own work.

We recommend that this dissertation may be placed before the examiners for evaluation.

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Dedicated to the memory of

Late Kanailal Sen (my uncle)

and

Late Abhoypada Nandi (my Physics teacher)

A C K N O W L E D G E M E N T

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(MALAYKUMAR SEN)

C O N T E N T S

A B S T R A C T

The present study was undertaken to explore the relationships among different variables of perceptions of classroom environment, teacher styles and learning strategies adopted by the students .

Matching variables were institutional types, stream and sex Perceptions of classroom environment, teacher styles, learning strategies and academic performance were taken as explanatory variables. A 2 x 2 x 2 factorial design and purposive sampling was used.

The sample consisted of 175 students of Class XI from two schools and one college, and 54 teachers teaching those students.

The tools used were Kirton's Adaptor Innovator Inventory (KAI), Ramsden's Approaches to Study (ASI) Inventory modified by the present researcher and Fisher's Perceptions of Classroom Environment Inventory modified by Das.

The major findings were:-

i) SES of teachers were related to teacher styles.

ii) The school students perceived classroom environment more positive, adopted deep strategy and achieved better in academic performance than

college students. College students adopted strategic strategy more often than school students.

iii) Science and non-science students did not differ on perceptions of classroom environment, and deep strategy but science students adopted strategic strategy more often and also achieved better in academic performance.

iv) Female students perceived classroom environment more positive, adopted deep strategy more often and achieved better in academic performance.

v) Positive classroom environment and innovative teacher or teacher having originality led students to adopt deep strategy in learning and good academic performance.

vi) Irrespective of the perceptions of classroom environment adaptive, confoming or efficient teachers led students to adopt strategic strategy in learning and better academic performance

vii) The factor analysis of item on Approaches to Study Inventory yielded 12 factors. After clubbing four factors, namely deep strategy, surface strategy, strategic strategy and styles and pathological factor were interpreted.

viii) The factor analysis of items on MAI yielded six factors. After clubbing, three factors, namely Originality, Methodical Weberianism and Mertonian Conformists were interpreted.

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CHAPTER - I

INTRODUCTION

Education is organised to assist learners in acquiring and improving their cognitive and psychomotor abilities and behavioural characteristics. It calls for continuous and multidimensional efforts on the part of the teachers as well as the learners and all those participating in the process of education directly or indirectly. Learning is the foundation on which the educational super-structure is built. Educationists and psychologists have always been concerned about making it easy and effective process.

Learning is influenced by numerous factors, such as learners' characteristics, teachers' characteristics, socio-cultural factors, contrieved environment, curricular materials and experiences and so on. The learner is a bundle of various traits, capabilities and aptitudes which in interaction with the environment shape the personality. The nature of interactions between the organisation and the social and cultural environment affect the learning process. Thus, in designing effective learning processes and learning experiences, the unique world of learners ought to be considered.

Students' perceptions of what they are required to do affect students' learning approach or strategy as well as the outcomes. At the level of learning the task itself, the perceived relevance of the task and the way it is undertaken affect students' motivation. This is important in designing curriculum and how the students would study materials.

In the pursuit of making learning effective, the issue of effectiveness of teacher has remained significant. Teaching effectiveness has been viewed over the years in terms of the effects it has on the learners. Education Commission (1964-66) emphasized the important role of the teacher as an agent of the envisaged economic and social change. The ultimate criteria for judging a teacher was the improvement in the education of learners. In otherwords, the teacher styles in inculcating the desired effective learning strategy in learners, their attitudes and enthusiasm, their concern for helping students to understand and particularly their ability to understand the difficulties experienced by students in dealing with new situations are likely to affect students' approaches and teachers' own effectiveness. Learning results from interactions between students and students as well as students and

teachers, using curriculm contents as the mode, in the context of institutions variables, inadequacies in domain may affect learning effectiveness positively or adversely.

EFFECTIVE LEARNING

Effective learning may be defined as the process of achieving mastery or control over the acquired experiences. An effective learner is expected to possess knowledge, understanding of various concepts, analysis, synthesis, application, appreciation, original and fresh thinking (Modey, 1982). In addition to these an effective learner is expected to express his ideas clearly and coherently. It has been recognised that to be an effective learner, the student needs to have a sense of one's own identity, from which comes a sense of self confidence. A mature, confident student will be able to look critically at one's learning strategies, to experiment with alternatives and to adopt flexible learning strategies which may be suitable for particular courses, or even part of the courses (Wright, 1982). Learning acts require the presence of several internal states in the learner. Among these are information storage and retrieval capacities, intellectual skills and cognitive strategies (Gagne & Briggs, 1974). The type of thoughts and

behaviours, as well as the processes used to create, implement and monitor them, are called learning strategies. An effective learning strategy should include cognitive, affective and behavioural activity that facilitates encoding, storing, retrieving, or using knowledge (O' neil and Spelberger, 1979). If the students have effective learning they can take responsibility for their own learning by creating, implementing and monitoring strategies, thoughts and behaviours. In addition to possessing certain information necessary to understand new context, the learners need a variety of intellectual skills, such as problem solving skills, concept acquisition skills and discrimination learning skills. Cognitive and intellectual learning strategies are needed for the individual to select and govern his or her behaviour in attending to the learning situation, managing the information storage and retrieval, and organizing the learning or problem situation.

Researchers using both quantitative (Entwistle and Ramsden, 1983; Biggs, 1985) and qualitative methods (Marton, Hounsell and Entwistle, 1984) have identified two similar approaches on strategies of learning which students tend to adopt and have shown that these different strategies are likely to lead to qualitatively different learning outcomes.

Effective learning is known to be contingent on forces in the four domains, namely, learner, teacher, context and content. These may be discussed below in brief.

LEARNER CHARACTERISTICS

Learner characteristics are important for learning. These include aptitude, interest, ability, study habits and motivation. Aptitude refers to inclination to learn. The learner is expected to have aptitude to learn the materials taught and gather relevant information from the surroundings as well as use knowledge in coping with the surroundings. Interest refers to preferences of the learner. She/he has to be given freedom to choose the subjects for herself/himself and find what ones interest is. Ability refers to capacity to do something. The learner is expected to possess general and specific ability to perform the required tasks and master skills. Study habits refer to plan of study. An effective learner uses a definite plan of study, scans, outlines and reviews the study materials.

Motivational processes influence learner's acquisition, transfer, use of knowledge and skills. Motivational processes have been shown to affect (a) how well learners can deploy their existing skills and knowledge, (b) how well they acquire new skills and knowledge, and (c) how well they transfer these new skills and knowledge to novel situations (Dweck, 1986).

Studies on motivation deal with the causes of goal oriented activities (Atkinson, 1964; Beck, 1983; Dollard and Miller, 1950; Veroff, 1969). Scholastic achievement involves a particular class of goals falling into two classes: (a) learning goals; in which individuals seek to increase their competence, to understand or to master something new, and (b) performance goals, in which individuals seek to gain favourable judgements on their competence or avoid negative judgements on their competence (Dweck and Elliott, 1983; Nicholls, 1984).

The attitude is also an important characteristic of the learner. Attitude is a state of mental readiness to perceive things in a particular way. A positive attitude of the learner towards teaching, teacher and contents is likely to influence learning in a positive direction and the vice versa.

TEACHER CHARACTERISTICS

Teachers are known to have immense influence on student's personality and behaviour. They shape or curb the personality development of children at the school level by providing them the type of training they wish to provide. They are important role models at school from where the students actually step out into real life situations and require lot of inner strength and commitment to be successful when confronted with life's challenging problems. Glidewell (1951) reported that "the most effective teacher can be seen as one who seeks, through his feeling as one medium, the reality of her students (the psyche aspect) with an eye toward a need meeting group learning activity (the sociol aspect)" (p.120). Heil and Washbourne (1962) reported that work oriented, orderly and self controlling teachers are liked more by high scorers. Amidson and Thenter (1963) defined teaching as an intensive process primarily involving the classroom talk which takes place between the teacher and pupils and occurs through certain definable activities. This definition includes various characteristics of the teacher such as intelligence, motivation, personality,

teaching styles, classroom behaviour, teacher cue resources and interpretations, and teacher mediating responses. An intelligent teacher thinks rationally, acts purposefully and deals with environment effectively in the classroom context. Motivation to teach the student is important in the teaching learning process. Personality of the teacher generates self cofidence among students and their acquisition of knowledge and its application in various fields.

Several researches have been conducted to identify teacher characteristics which facilitate the development of students as 'total person'. It has been found that if teachers interact with students in a genuine manner, accept students as persons and emphatically understand them, then the likelihood is that the educational experience will be academically and personally beneficial to students (Roscoe and Peterson, 1982). Similarly if learning situations are characterised by emotional warmth, respect, success and freedom, then what transpires in these situations will facilitate the intellectual and psychological growth of all involved. To be truly effective teacher it is required that one has considerable knowledge of one's area of study, of oneself, of others and of the dynamics of interacting

in a meaningful way. What is needed more, therefore, is a sincere desire and commitment on the part of teachers to be of assistance in helping students to learn.

Hawley and Rosenhaltz (1984) have described teaching as "the core technology of formal education". They added that teachers modify curricula, intentionally or not. They keep the gates through which students must pass to gain access to the learning resources available. Teachers allocate and manage student's time, set and communicate standards and expectations from student performance and in a multitude of ways enhance or impede what students learn".

An important dimension of effective teaching is the teacher styles through which actually exert influence on students and on their learning outcome. Fiedler (1967) and House (1971) emphasized the task and person orientation of styles as sources of orientation. Flander (1970) maintained that depending on the method of teaching teachers could be classified as direct teachers(who deliver lecture in the class and give specific directions to students about their work) and indirect teachers (who put questions to students and permit a lot of student-initiated behaviours). He also found that students taught by indirect teachers learnt more than students taught by

indirect teachers learnt more than students taught by direct teachers. In the Indian context Sinha (1980) has reported about the nurturant task style, which has two main components: concern for task and nurturant orientation. The teacher displaying such a style should want the students to complete their assignments, for which he guides and directs them to work hard and maintain a high level of productivity both quantitatively and qualitatively. He takes a personal interest in their well-being and above all is committed to their growth.

According to Kirton (1976) every person can be located on a continuum ranging from an ability to "do things better" to an ability to "do things differently" and the ends of the continuum are labeled as adaptive and innovative respectively. Some people characteristically adapt whereas some characteristically innovate. If there are teachers in educational organizations who can be characterized as adaptors or innovators, it would be useful to explore empirically the interplay between adaptors and innovators in various teaching learning situations. It is reported that adaptors and innovators bring incommensurable view-points and different solutions to the different problems of their teaching and student's learning process. Teacher styles affect the students

acquisition of knowledge and its application and the performance in the classroom.

CONTEXT CHARACTERISTICS

It refers to the conditions of learning and delivery of the curriculum to the learner. According to Dunkin and Biddle (1974), context variables include context of the organization and context in the classroom. Context of organisation includes institution size, ethnic composition of the students, teachers and administrators and physical facilities. Classroom context includes climate, size, text materials, curriculum and institutional aids. Institutional context is known as organizational climate, while the classroom context is known as classroom environment.

CLASSROOM ENVIRONMENT

It is widely acclaimed that a good classroom environment is a potential facilitator of learning. All the teaching learning processes are to occur

within an environment. Educational environment is defined as "the conditions, processes and psychological stimuli which affect the educational achievements of the child." It refers to those forces in the environment which have the potentiality to contribute to academic development of the learner.

The classroom environment has been conceptualized by researchers as the social and psychological forces that influence the functioning of the whole group and sub-groups within the class (Walberg, 1979). These social and psychological forces are seen comprising of three distinct but interacting dimensions. First dimension is of the relationships that develop in classroom context. The second dimension is the goal orientation and personal features in the environment, which are generally thought of as the task or academic orientation that exist in the classroom. The third dimension is the system maintenance and change dimension. It indicates the degree to which the classrooms are orderly and organized; how control is maintained in them; how much students are involved in the classroom planning, and the amount of unusual and varying activities that occur (Moos, 1979). In sum, classroom

environment can be conceived as the resultant interaction among external learning conditions; personality characteristics of individual learners; and the institutionalized norms, values and culture.

During the last two decades, considerable interest has been displayed in the conceptualization, and measurement of psycho-social characteristics of the environment of primary and secondary schools. The use of perceptual approach is found to have some advantages over classroom interaction analysis that involves observations and systematic coding of classroom communication and events according to a predetermined category system.

Classroom environment instruments have been used as predictors and criterion variables in a variety of research studies in primary and secondary schools. Use of student perceptions of classroom environment as predictor variable has demonstated consistent relationships between the nature of classroom environment and various cognitive and affective outcomes (Haert et al. 1981).

Studies involving use of the classroom environment scales as criterion variables have revealed that classroom psychological climate varies between different

types of school (Trickett, 1978), between co-educational and single sex schools (Trickett et al. 1982), between classes of different sizes (Walberg, 1969), and between classes following different subject matter (Kuert, 1979). Many other studies have shown that classroom organisation and management, teacher's personality (Singh, 1981), teacher's attitude towards teaching (Goyal, 1981) are responsible for success of students in classroom learning situation. Riccotti (1982) found that the learner in schools with innovative organizational designs i.e. the non-graded and open space makes greater gain in reading achievement than those students in the traditional setting.

As a result of participating in classroom activities, pupils develop shared expectations about how the teacher will act, what kind of person he is and how they like their classes. These expectations have a bearing on all aspects of classroom behaviour of pupils creating a classroom environment that appears to be fairly stable once established, which in turn, either may inhibit or facilitate pupil learning.

CONTENT CHARACTERISTICS

The content may be defined as planned and organized learning teaching materials. It aims to provide systematic background to the taughts in different fields of education. In making the teaching-learning processes effective the content domain is emphasised by researchers in the field of curriculum development. The difficulty level of contents are matched to the developmental levels of pupils and a continuous upgrading of the materials used is advocated.

In India, the content aspects are given special importance in the National Policy of Education (1986). It is suggested that the curricula may be enriched by giving it a cultural orientation. Students are desired to develop sensitivity to beauty, harmony, etc. alongwith subject knowledge. Adequate facilities should be given to the students for oral and written communication. Moreover, vocation related activities and development of scientific temper should be given due importance in curriculum. The growing concern for essential values and increasing cynicism in society has brought to focus the need for adjustment in the curriculum in order to make education a forceful tool for the cultivation of social and moral values.

It is felt that educational technology should be employed in the spread of useful information, the training and retraining of teachers to improve quality of teaching and learning, sharpen awareness of art and culture, inclucate abiding values, etc. in both informal and non-formal sectors. The generation of relevant and culturally compatible educational programmes ought to form an important objective of educational technology and all available resources in the country ought to be utilised for maximising learning affectiveness at all levels of education.

Mathematics is visualised as the main vehicle to train a learner to think, reason, analyse and articulate logically. Apart from being a specific subject, it is treated as concomitant to any subject involving analysis and reasoning. Science education is proposed to be strengthened so as to develop in the learner well defined abilities and values such as the spirit of enquiry, creativity, objectivity, the courage to question, and an aesthetic sensibility. Work experience is to be viewed as a purposive and meaningful manual work. It needs to be organized as an integral part of the learning process itself resulting in either goods or services useful to

community. It should be considered as an essential component at all stages of education to be provided through well structured and graded programmes. It should comprise of activities in congruence with the interests, abilities and needs of students.

The above observations infact formed the rationale of the present study. It has been visualised to relate two teacher styles (Innovator and Adaptor) to student outcomes. It is believed that teacher styles influence students to adopt a particular learning strategy. No research could be traced in India on teacher's style and learning strategies adopted by the students in relation to the students' perception of classroom environment. This has prompted the present researcher to examine the relationships among the students' perceptions of classroom environment, teacher ' styles and learning strategies adopted by students. The learning strategies adopted by the students, teacher' styles as well as the classroom environment are assumed to interact with each other and thereby influence students' outcome.

NEED AND SIGNIFICANCE OF THE STUDY

In recent times effective learning has been widely discussed by researchers, psychologists, policy makers and experts. There is no consensus view on the indicators of learning effectiveness. It is felt that there is lack of well documented socio-psychological literature in this area. Moreover there is no unanimous opinion about how to make learning effective. The New Education Policy (1986) and priority areas identified by UGC focus on the need to make the education more effective as a potential tool of social change and modernization.

The present research would be helpful, it is hoped, in explaining some crucial aspects of the determinants of student achievement. The findings, if positive, may be utilised for strengthening classroom teaching procedures and practices and thus control the wastage of educational efforts.

In addition to failures, there are under achievers who pass the examination. Yet they fail to achieve as high as they could in terms of their mental abilities.

If the causes of failure are known, it may be possible to take necessary remedial measures. Under achievement or failure is not only due to personality factors, but perceptions of classroom environment, teacher styles learning strategy adopted by the students may be some of the relevant influential factors also. The present study may help the teacher in understanding various dimensions of classroom environment and its role in making students adopt the desired learning strategy leading to success.

Teacher styles is an important ingradient of the whole educational system. The present study may contribute substantially to improve teacher styles by explaining and showing the way how the learning strategy adopted by the students and classroom environment are related to it.

CHAPTER - II

REVIEW OF RELATED LIBERATURE

This chapter includes review of the related literature on (i) classroom environment and teaching and learning, (ii) teacher styles and school performance and (iii) learning approaches or strategies adopted by the students.

2.1 CLASSROOM ENVIRONMENT AND TEACHING AND LEARNING

The formula, B = f (p, E) propounded by Lewin (1935) denoted that behaviour is a function of both the person and environment. Since then, a number of theorists have demonstrated how these two intract and shape the behaviour. Although environmental factors were acknowledged to be central to theories of learning and cognitive development, relatively little work had been done to examine the relationships between the environment of the school and classroom and the influence of these on the achievement of children in school. In fact the studies related to classroom environment had focussed on the relationship that might be existing between various dimensions of classroom environment and learning.

Flanders (1951) argued that pupils, first of all try to solve the problems of adjustment in their classrooms rather than tackle the problems of learning. Learning was possible only when students felt well adjusted in their classes. If there was little or no anxiety, threat, confusion or mental tension, the learning could take place effectively. Perkins (1951) found that effective learning could take place in the classroom environment in which the teacher and the class felt their personal needs were satisfied. The initial set of feelings and relations established in the classroom appeared to determine the amount and the kind of student learning.

Glidewell (1951) tried to investigate how effective a classroom environment could be when the teacher desired to satisfy his own feelings. Glidewell concluded that the classroom environment characterised by the denial of feelings by the teacher was accompanied by reduction of effectiveness of teaching-learning (p.126). Moustakas (1956) in a clinical, anecdotal, observational but non-experimental work, found that effective learning could take place in the educational institutions where threat and anxiety were minimum. "Effective learning required that there was freedom of expression within the limits of the classroom, where each person could state himself

without fear of criticism or condemnation, where feelings were expressed and explored, where ideas and creative thinking were treasured and where growth of self was the most important value" (p.259). Jackson and Getzel (1959) summarised their findings on the differences in psychological functioning and classroom effectiveness of two groups of adolescents - those who were satisfied with their recent school experiences and those who were dissatisfied. The findings were as follows:-

i) Contrary to the popular expectations the satisfied and dissatisfied students did not differ from each other in either general intellectual ability or in scholastic achievement.

ii) The satisfied group attained higher scores.

iii) The satisfied and dissatisfied students were perceived differently by their teachers.

Bloom (1964) surveyed the evidence emerging from longitudinal studies about the effects of environmental conditions on the development of human characteristics and found nothing to contradict the proposition that

the environment was a determiner of the extent and kind of change taking place in a particular characteristics (p. 209). Solomon, Resenberg and Bezdeck (1964) interpreted their results using eight dimensions of teacher interaction, where each dimension was a bipolar construct. Eight dimensions of the study were (i) permissive Vs. control; (ii) lethargy Vs. energy; (iii) aggresiveness Vs. protectiveness; (iv) obscurity, vagueness Vs. clarity, expressiveness; (v) encouragement of content-related (factual) student participation Vs. non-encouragement of participation, (vi) dryness Vs. elamboyances; (vii) encouragement of students' expressive participation Vs. lecturing; and (viii) warmth Vs. coldness.

It was concluded that expressiveness was significantly correlated to factual gains. The highest gains in comprehension were found in classes of teachers moderate on permissiveness Vs. control continuum. It was inferred that "too much control perhaps inhibited and stifled the participation while too little allowed ophimeral and disconnected discussion and incomplete exploration of ideas" (p.29). Febel (1966) found that in an 'open' climate school, teacher perceived the efficacy of the student teaching situation more favourably than student teacher in a 'closed' climate school.

Anthony (1967) explored the relationship between the process variables of the classroom environment and the academic achievement. He identified the process variables as : opportunities for self-involvement, stimulation, and individual differentiation. Measurements on these three variables were combined to give classroom environment measures which correlated 0.64 with final achievement scores when controlled for initial achievement scores. This study provided evidence in favour of the contribution of aspects of the classroom environment of learning.

Goldberg (1968) concluded that compulsivity (high scoring) was strongly related to pupils' perception of teachers' behaviour. Students, who work carefully in order to do well in their classes perceived teachers as non-authoritarian, while low compulsive who were less concerned with doing well in school perceived them as authoritarian.

Walberg and Anderson (1968) undertook a national survey to investigate the relationship between the students' individual satisfaction with the climate of the class and the rate and amount of learning. The researchers concluded that different perceptions of classroom climates were associated with different kinds

of cognitive growth and achievement and that they also predicted the affective growth. Syntality or emotional identification with the group cause enhanced learning. The researchers concluded that it was not the identification with the group that correlated with learning but the perception that the class was personally gratifying and without hostilities among the members.

Mcdil et al. (1969) indicated that while the dimension of school environment did not account for the large proportion of the variance in achievement, it highlighted the contribution accounted by ability, father's education and academic values. Furthermore they showed that the degree of parents' commitment and involvement in the school could be considered as a source of influence on the school environment. Sharma (1969) observed that schools having 'open' and 'autonomous' climiate had significantly higher achievement index as compared to the 'closed' climate schools. Keeve's (1970) concluded in a study on educational environment and student achievement that the school environment made relatively larger contribution to both achievement and attitudes towards science and mathematics in comparison to home and peergroup variables. It made a smaller contribution to attitudes towards mathematics as compared to science.

Considerable interest had been shown in the conceptualization measurement and investigation of perceptions of psychological characteristics of the learning environment of primary and secondary schools. Becker at al. (1971) argued that early environment was less important than the academic environment in determining an individual's success. Walberg and Anderson (1973) in a study intended to find out relationships between social climates and achieving urban classes. They concluded that overall correlations between the Learning Environment Inventory (LEI) scales and mean achievement suggested that students rated higher on cohesiveness, environment satisfaction and lower on speed, friction favouritism, cliqueness, disorganisation and apathy tend to score higher on the standardised achievement test. Mcdill and Rigsby (1973) found that the environment accounted for significant amount of variance in student achievement and aspirations, if the student background was controlled.

Brookover and Sch eneider (1975) showed that (i) student futility and teacher expectations accounted for most of the achievement variance, (ii) students' futility was predicted largely by expectations and academic norms, (iii) high and low achieving schools differed on climate, when composition and community were controlled.

Ellett et al. (1977) conducted a study on climate dimensions and school achievement and attendance. They found that (a) the teacher and student perceptions of climate were relatively independent, (b) the achievement and attendance in elementary schools were negatively associated with difficulty, and (c) the achievement in secondary schools was positively associated with difficulty while attendance was positively associated with diversity and intimacy.

In a study Wyne (1980) used staff and student interviews, observations, and school documents respectively for the collection of data on students' character, development, student achievement, climate and school discipline. The following findings were reported:-

a) Character development was associated with student and staff attitudes.
b) Achievement was associated with parental involvement, teacher attitude, and the instructional programme.
c) Climate was associated with discipline/ rules, student and staff attitudes and activities.
d) Discipline was associated with instructional programme.

Haertel, Walberg, and Haertel (1981) reported consistent relationships between the nature of the classroom environment and various cognitive and affective student outcomes.

Fraser and Fisher's (1982) study established sizeable associations between several inquiry skills and science related attitudes and classroom environment dimensions measured by the Classroom Environment Scale (Rickett and Moss, 1973) and the Individualized Classroom Environment Questionnaire (Rentaul and Fraser, 1979).

Fraser and Fisher (1983 b, c) used the actual preferred forms of scales in exploring whether students achieved better when there was a higher similarity between actual classroom environment and that preferred by students. The use of regression surface analysis yielded support for the person - environment fit hypothesis but students achieved better in their preferred classroom environment.

In his dectoral work Hamberlin (1983) studied the effects of classroom environment on academic achievement, classroom behaviour and attitudes of ninth grade students in one public school. He concluded that: (a) students instructed in the stimulating classroom environment in comparison to students instructed in the non-stimulating classroom

environment performed better academically, prepared for class more frequently, completed more housework assignments and attended more classes, (b) students instructed in the stimulating environment had more positive self-reported attitudes and perceptions than their counterparts.

Sharma (1985) observed that academic achievement and school satisfaction had a positive and significant relationship. The differences between the academic achievement of the satisfied group and the dissatisffed group were significant.

Das, M. (1989) studied the effect of classroom environment on communication effectiveness of ETV programmes in science and social studies at secondary school level. She reported that there were no significant differences between the students of science and social studies on perceptions of classroom environment scores. Girls' perceptions of classroom environment were however more positive than boys.

2.2 TEACHER STYLES AND LEARNING

Different studies have revealed that teacher effectiveness was a multidimensional phenomenon. The question - what ingredients constituted teacher effectiveness was answered differently by different researchers. To some, a teacher was effective if his pupil scored high, to other teacher effectiveness was related to modification of pupil behaviour. To a few others teacher was effective only if he successfully brought about adequate personal adjustment on the part of pupils. Irrespective of the criteria of teacher effectiveness these studies indicated that teachers' classroom behaviour and style effects were related to teacher effectiveness.

The teaching styles of teachers had been examined for effectiveness/ineffectiveness in the teacher student interaction in the classroom situations. The person situation theories maintained that teachers could either be task oriented or people oriented. An effective task oriented teacher is one who specified the expected learning outcomes and then structured his teaching to lead to that outcome. Teachers using this style were found effective in a

number of studies (Torrance and Parent, 1966; Fortune, 1967; Skinner, 1968; Propham and Baker, 1970). By contrast, the proponents of people orientation style argued that an effective teacher incorporated students' ideas in the classroom praised students for their performance and actual 'warm' in the class. Research in support of these predictions showed mixed findings (Allen, 1969; Flanders, 1970; Wright and Nuthall, 1970).

In applying the Fiedler's contingency model to the academic context, it was found logical to argue that the teacher style which maximized learning should depend on the favourableness of the situation for teaching. In a situation that was intermediate in favourableness, the relations oriented teacher should be more effective (in terms of meeting the goals of the organisation) than the task oriented teacher. In highly favourable or unfavourable situations, the task oriented teacher should be more effective than the relation oriented teacher. However, only partial support had been obtained for Fiedler's model in college (Hardy, 1969) and school (Reave's and Derlega, 1976) settings. Only few studies, the person oriented teacher had been found more effective in both types of situations (Kleinman, 1964; Combs, 1965; Soar, 1966; Fortune, 1967; Gage, 1969).

Teaching styles were found effective in influencing outcomes. Four instructional models of teachers based on their classroom hebaviour, orientation toward others and toward the environment were hypothesized by Goyce and Weil (1972). These four teaching style families, as they called them, were - (i) social interaction, (ii) information processing, (iii) personal source, and (iv) behaviour modification. In an attempt to identify the human values related to these four teaching styles families Rosenblatt and Parish (1979) administered the Rokeach (1973) Value survey to students who were also administered Teaching Style Q-sort (Heikkenin, 1977). The findings suggested that certain human values were indeed of varied importance for individuals in different teaching style categories. For example, individuals in the personal source family rated 'obedience' as significantly less important than individuals in the behaviour modification family. Members of the information processing family gave more importance to 'freedom' than members of social interaction family. Males placed significantly higher priorities than females on a comfortable life, an exciting life, pleasure, ambition and broadmindedness. The females gave priority to happiness, inner harmony, self-respect, cheerfulness, forgiveness and love.

Kirton (1976) argued that people differed in their approach to problem solving. He described these differences as two styles; namely adaption and innovation. Adaptors preferred familiar methods and used existing principles to solve problems, perceiving as much as possible of the existing context of the problem. In contrast, innovators preferred new and different solutions to problems which disrupted rather than preserved the familiar patterns in which problems existed.

The Kirton Adaption - Innovation Inventory was designed to locate the respondents on a single continuum indicating the style of creativity characteristics of the individual (Kirton, 1977). Adaptors tend to cope with novelties (new unexpected stimuli) by assuming at the outset that a relevant paradigm existed in the perception of novelties. The integration of any novelty into the paradigm structure could give rise to a solution at once highly creative and supportive in general terms of the paradigm. Such a solution not only resolved an initial anomaly but turned a possible threat to the paradigm into support for it. The strengthened paradigm might show later

improved capacity to resolve further anomalies in the same field. Innovators were characteristically less concerned with the maintenance of paradigms and so their creativity or problem solving was more likely to lead - for - them - to a new paradigm or in Kuhn's terms a paradigm switch. The task of getting their solutions accepted was considerably greater than the adaptors. Conversely adaptors expend more effort where necessary in obtaining results in accord with the paradigms they deemed relevant. In the pursuit of the solutions of perceived problems adaptors were described as exhibiting greater restraint, regard for the notions of others, soundness of opinion, reliability of performance and other attributes of immediate value to 'systems' bureaucracies; Innovators were seen as having the obverse characteristics. The KAI Inventory had been shown to be composed factorially of three traits labelled originality (after descriptions of Rogers,1959), efficiency (Weber, 1947) and rule/group conformity (Merton, 1957).

According to Kirton (1978) what distinguished adaptors from innovators was the size of the cognitive domain deemed appropriate to the search. Both initially might view an anomaly for which a (creative) solution

was required, as a residual puzzle to a selected paradigm and thus feel limited by its perceived boundaries. Adaptors found these boundaries less elastic and permeable than innovators.

In another study, Tuckman, Steber and Hyman (1979) asked three levels of principals elementary, intermediate and high school level, to rate effective and ineffective teachers on four dimensions - creativity, dynamism, organised demeanor and, warmth and acceptance. Intermediate principals rated effective teachers higher on creativity than did high school principals. High school principals rated warmth and acceptance and ungraded dynamism as the characteristics of the effective teachers. These differences were found consistent with the teaching requirements at different levels.

The effectiveness of Sinha's (1980) nurturant task style in the educational context had been tested in some studies. Sinha himself examined five academic departments across two universities, one rural and one urban. A group of students and teachers spelled out the various leadership acts of the Heads of their respective departments. These were edited for their content validity and placed in either of

the five categories: authoritarian, nurturant task, participative, bureaucratic and liassez faire. Results showed that the largest number of acts were found to be associated with nurturant task style. Authoritarian style followed closely, while the participative and the other two styles lagged far behind. The University in the rural setting was found to be higher on authoritarian leadership style, while the one in the state capital was found to be higher on nuturant task style and participative style. The Heads of the Science departments were found to be slightly more nurturant and participative than those in arts departments.

A study by Sundaralakhsmi (1981) showed that the teacher initiator strategy had a positive and greater influence on academic performance and initiative than teacher facilitator strategy. Rajamony (1981) observed that the skill of asking appropriate precise questions, clearly stated purposeful and divergent questions and securing greater involvement of students resulted in significant improvement in students behaviour. Pandey (1981) reported that teacher's questioning had significant positive effects on both levels, classifactory and formal concept attainment. The findings by Passi and Sharma (1982) showed that there was

significant positive relationship between the teacher's teaching competency, the liking by their pupils of their teaching behaviour, and academic achievement of the pupils of grade IX.

In a recent study large numbers of school students were found to appreciate and rate high only such teachers who had the ability to explain the course material and who were generally aware of student needs (cullingford 1987). Goldsmith and Matherly (1987) reported strong relationships between the originality subscale of Kirton's measure and the creative level measures. When generating ideas Kirton (1987) held that the adaptors preferred to produce fewer original ideas, focussing on generating a large quantity of which some were likely to be radical or "Paradigm cracking".

Kirton (1987) made a clear distinction between his measure of creative style and other measures of creative level. Kirton has described the adaptor as preferring to produce fewer ideas, while the innovator will prefer to produce many. Kirton has maintained that there should be no relation between these preferences for idea production and the actual capacity to produce ideas, the t-tests have shown a significant difference in the number

of ideas generated by adaptors and innovators. Whether these differences were the result of the style measure containing a level dimension or the level measure containing a style dimension was open for further enquiry.

Isaksen and Puccio (1988) reported that a significant difference was found for Torrance's measure of fluency, the extreme innovators were more fluent than the extreme adaptors. Men produced larger correlations for the total score and scores on each of the three subscales of Kirton's measure and scores on the fluency, flexibility and originality subtests of Torrance's measure.

2.3 LEARNING STRATEGIES

Learning strategies were known to be potentially useful in a number of learning situations. It was assumed that effective education and training occured when high quality instruction was imparted under conditions conducive to learning, to students adopting effective learning strategies.

Organizational procedures utilized by learners occupied a prominent position in many of the contemporary theories of learning and memory. Miller (1956) investigated the role of one type of organization in the learning of the verbal material. He found that people were able to store in short term memory no more than seven (plus or minus two) units at any one time, but that each of these units could be made richer in meaning and structure by 'chunking'. Chunking involved the recording of material to be learned into larger internally connected chunks.

The cognitive psychologists, unlike the behaviourist, emphasized the role of organisms 'covert' manipulations of the incoming stimuli in predicting responses. Burner, Goodnow and Austin (1956) developed procedures to identify strategies used by students and demonstrated that different strategies were differently effective for the concept learning task. Newell, Simon and Shaw (1958) effectively simulated problem solving strategies via computer. Finally, Miller, Galanter and Pribram (1960) analyzed and categorized strategies used in a wide range of tasks. The work of Underwood (1969), Posner and Paivio (1971) indicated that various codes for attributes of learning materials were used by learners to organize information to be learned and retained for later use.

An accumulated body of evidence indicated that students used strategies to store and retrieve information. Students did not function as simple and passive receptacles in which associative bonds were imprinted and then remained available for later activation; when the proper stimulus was presented (Melton & Mertin, 1972; Tulving & Donaldson, 1972). Pask (1972) carried out several experiments to discover important differences among students as they used different learning strategies. Some students concentrated on a step by step strategy described as 'serialist' indicating the linear progression from one hypothesis to the next. Other students used more complex hypotheses combined with several properties simultaneously. This strategy was described as 'holist'. Pask also identified an additional type of Holist, 'the redundant Holist; who depended on individualistic ways of discriminating between the subspecies.

Gagne and Brigges (1974) stated that learning acts required the presence of several internal states in the learner. Among these were information storage and retrieval capabilities, intellectual skills, and cognitive strategies. In addition to possessing

certain information necessary to understand new content, the learner needed a variety of intellectual skills, such as problem solving skills, concept acquisition skills and discrimination learning skills. Cognitive or intellectual learning strategies were needed for the individual to select and govern his or her behaviour in attending to the learning situation, managing the information storage and retrieval, and organizing the learning or problem solution.

Two main points were considered by Dansereau et al. (1975) in the development of the comprehension and retention strategies. First according to the learning strategy inventory results (Dansereau, et al. 1975) it appeared that many students tend to receive information passively and consequently. They did not actively integrate it into their cognitive structure. Second many students did not attempt to produce multiple memory representations (encoding) of the same material in order to enhance retrieval (especially in contexts that differed from the original learning situation).

Svenson's (1975) used 'holistie' and 'atomistic' categories which represented different ways in which students organized or structured their responses in

describing what they remembered. The 'Holistic' approach involved integrating the main parts into a structured while. The 'atomistic' approach concentrated on aggregating the parts without interrelating or integrating them.

Marton classified the approaches used by students as 'deep' or 'surface' if they showed at least one clear indication or either of the two approaches. According to him the natural approach was a deep one (Marton, 1976). Marton and Saljo (1976) showed that students who gave a 'deep' level processing account of their approach to a task scored better on tests of understanding than students who described a 'surface' level processing approach. Pask (1976) felt that the holistic strategy involved looking at the whole area being learned, taking a broad perspective, seeking interconnection with other topics and making use of personal and idiosyncratic analogies. The serialists failed to make use of the valid and important analogies and were unable to build up an overall map to see how the various elements of the topic interrelated and how the topic fitted into the subject area in general. Pask called this

pathology 'improvidence'. Pask described 'globetrotting', as the tendency of the Holist to make appropriate or vacuous analogies. This pathology might also take the form of an overreadiness to generalize from insufficient evidence to form hasty, personal judgement. But there were other students who were readily able to adopt task specific learning strategy to emphasizing either comprehension learning or operation learning as appropriate, and using both at tandem whereever possible. Pask labeled it as a 'versatile' style of learning.

The most crucial variables in this as Fransson's original experiment showed (Fransson, 1977) was the student's perception of what he was required to do. The effects of contrasting perceptions could be seen at more than one level. For example, at the level of learning the task itself, perceived interest and relevance undoubtedly increased intrinsic motivation and made a deep approach more likely to occur. Tasks which were perceived as requiring only reproduction, or on which the student was mainly extrinsically motivated, increased the probability of a surface approach. It was also found that a students' interest in the subject matter was crucial to a deep approach, especially in arts and social science subjects, while prerequisite knowledge was most often mentioned in relation to science tasks.

The second level at which the effects of learning context operated was of the individual teacher. The attitudes and enthusiasm of a teacher, his concern for helping students to understand, and particularly his ability to understand the difficulties experienced by students in dealing with a new topic were likely to affect the students' approach and attitudes to studying.

Dansereau (1978) distinguished between the two classes of strategies namely; those used to operate directly on the materials and those used to operate on the individual in order to maintain a suitable internal psychological climate. The first class of techniques was termed as 'primary' strategies. Persons required to learn materials must be able to identify the important, difficult and unfamiliar portions of the material, apply techniques to comprehend and certain this material and subsequently recall and use the acquired information under appropriate circumstances. Four primary strategy areas were identification, comprehension, retention and retrieval. The second category of strategies labeled as 'support' strategies, consisted of strategies to allow the primary strategies to be followed efficiently and effectively. These would include techniques for establishing an appropriate

learning attitude and methods for coping with loss of 'concentration' due to the presence of distractions, fatigue, frustration, or the like.

Laurillard (1979) believed that learning should be understood in its educational context and focused on what students actually did when they learnt. The execution of the task, style, demand as well as students' perceptions of the teaching were relevant to it. It was found that some students could be both 'surface level' and 'deep level' processors depending on different requirements of assessment by considering what they themselves wanted to achieve by doing it. Beside deep approach and surface approach a third approach was introduced by Ramsden (1981). He described it as 'strategic approach' through which students sought to maximize their grades by strategic management of their time and intellectual resources in line with the perceived criteria for high grades.

The Inventory of Learning Processes described by Schmeck (1983) had consistently yielded four main factors. Deep processing described the extent to which student critically evaluated, conceptually organised and compared and contrasted the information being studied. 'Elaborative processing' indicated the extent to which students translated new information into their own

terminology, applied it to their own lives, generated concrete example from their own experiences and used virtual imagery for the purpose of encoding new information. 'Fact retention' involved perceived facility at learning facts and details, while 'methodical study' contained activities recommended by 'How to study' manuals.

Weinstein and Underwood (1983) listed four major classes of strategies: information processing, study, support and metacognitive. Information processing strategies included developing readiness, reading or viewing for meaning, recalling material, integrating it with prior knowledge, expanding or elaborating it, and finally reviewing what had been learned. Study strategies included those techniques in which learners actively processed information. These included note taking, outlining, underlining as well as some nontraditional techniques such as pattern noting. Support strategies included creating a positive attitude and concentration management (dealing with distractions) as well as maintaining attention (staying on task) and organising study time. Metacognitive strategies were monitoring of the comprehension and were designed to improve self control and self regulation of the learning processes.

Biggs (1987) reported three main strategies of learning effectively, deep, surface and achieving (which combines organization and competition). Entwistle (1988) reported that there were four main orientations to studying into which approaches to learning, styles of learning, and associated form of motivation merged. These four orientations were described as 'achieving' (with - components covering strategic approach, hope for success, and vocational motivation), 'meaning' (deep approach, and intrinsic motivation), 'reproducing' (surface approach and fear of failure) and 'non-academic' (disorganised study methods, negative attitudes, and social motivation).

2.4 Sex as a variable:

Gender difference had been found to exercise significant influence on the effectiveness of a teacher. Fogarty, Rapoport and Rapoport (1971) found that males used a more authoritarian style of supervision than females. Rosen and Gardee (1974) and Fromkin and Wilack (1975) provided evidence to prove that given identical qualifications, the persons' gender influenced evaluations. In high task-clarity situations, however, Ruch and Newton

(1977) did not find sex characteristics to have any effect on group control.

2.5 EDUCATION LEVEL AS A VARIABLE

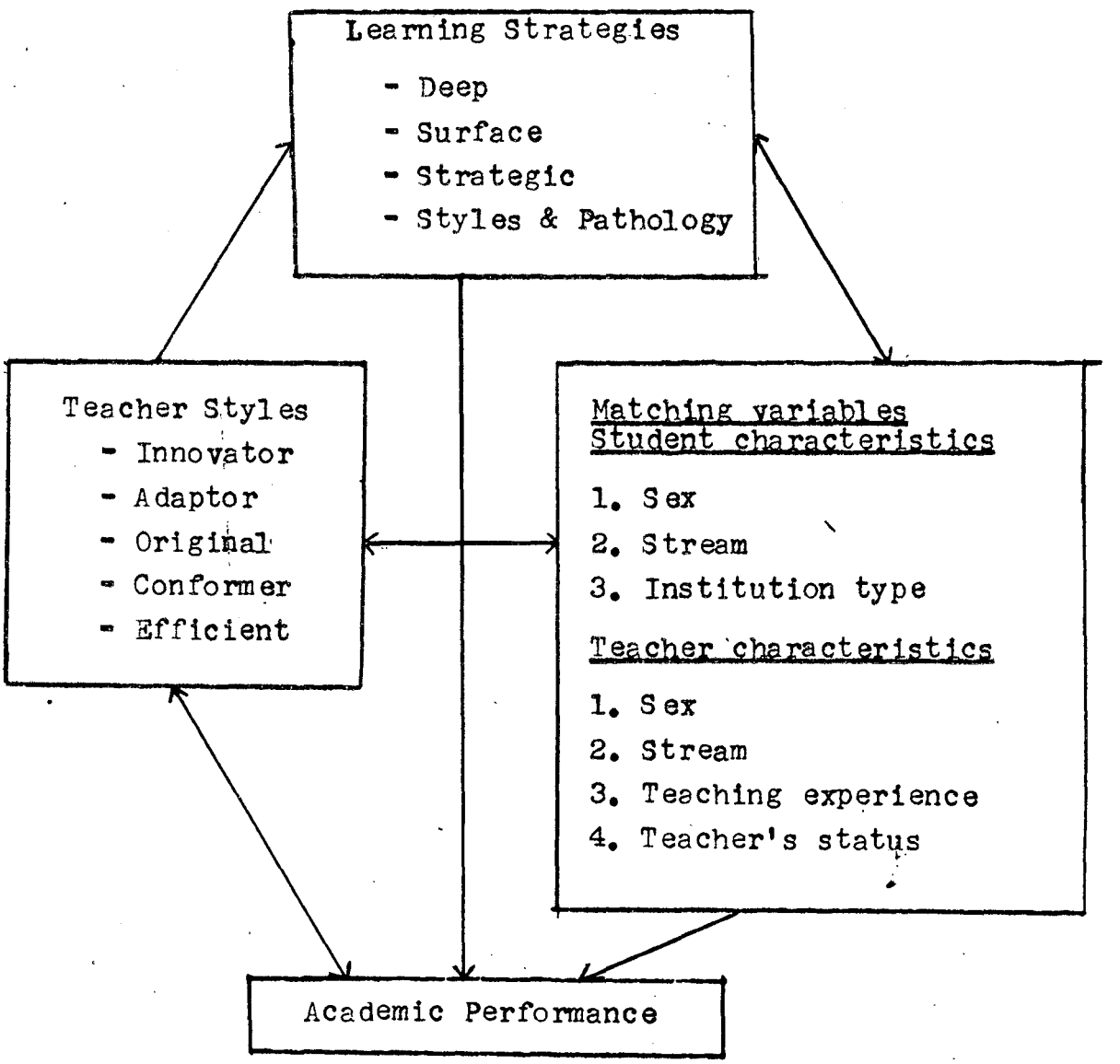
Students' academic performance, commitment and adjustment was known to different educational levels. Study carried out by Banreti-Fuchs (1975) on students of 9th grade in school and first year college - reported that certain factors were common in the two groups. There were also a number of factors on which the two groups differed. Banreti-Fuchs reported that high achievers at both the education levels attended lectures regularly, had few feiends, had less of behaviour problems and showed stable academic performance throughout the year - as compared to the low achievers of both the groups. College students were found to be less conforming, however, another difference was in the area of work concentration. The school students were found to concentrate on work first and then relax. The college students showed tendency to put off work for a later date. Singhal (1984) reported that second and third year students across a number of colleges differ in their

ratings of teacher-effectiveness variables. In another comparative study on undergraduate and post-graduates, Singhal (1988) obtained findings to suggest that while students at two levels agreed on the characteristics perceived in an effective teacher, they differed about the components of global perceptions of effectiveness.

In this chapter a good number of studies were reviewed in the area of teacher's style, classroom environment and learning strategies adopted by the students. A number of studies had explored the relationships between schools/college environments and student outcomes e.g. academic performance. If the classroom environment was intellectually challenging and stimulating it had a beneficial and facilitating effect on students affective and hehavioural learning. Studies had also focused on teacher-student interaction, showing the effectiveness of one teaching style over the other. However, an integrative study, involving variables name of teacher's style, perception of classroom environment and learing strategy adopted by the students was found missing. It was in this context that the present research was conceived. It is proposed to find out the interrelationships among teachers' styles, perceptions of classroom enviroment,

learning strategy adopted by the students and student's academic performance by focusing on two streams (science and non-science) and two institutions types (school and college). The analytic model of expected relationships may be shown as below:-

Fig. 1 AN ANALYTICAL MODEL FOR PRESENT STUDY



CHAPTER - III

METHODOLOGY

The review of literature in the previous chapter revealed two significant points:-

1. The relationship between teacher's style and learning strategies adopted by the students had not been systematically investigated.
2. It was not clear what type of classroom environment was conductive to which learning strategy.

Appropriate controls were lacking in these studies. Effects of intervening variables were not pertailed out.

It was against this background and evidence that the present problem to study TEACHER STYLES AND LEARNING STRATEGIES ADOPTED BY STUDENTS was formulated.

3.1 PROBLEM STATEMENT

The problem statement may be mentioned in the form of the following questions:-

i) Do institution types, streams and sex affect academic performance, teacher styles and learning strategies adopted by students?

ii) Do the teacher styles relate to the classroom environment, learning strategies adopted by students and academic performance?

3.2 OBJECTIVES OF THE STUDY

The following primary objectives were laid down in order to provide direction to the formulation of testable hypotheses.

i) To find out whether school students differed in perceptions of classroom environment, academic performance and learning strategies than college students.

ii) To find out whether students enrolled in different streams (science and non-science) differed in perceptions of classroom environment, academic performance and learning strategies.

iii) To find out whether male students differed in perceptions of classroom environment, academic performance and learning strategies than females.

iv) To identify the interrelations among learning strategies adopted by the students, classroom environment, teacher styles and academic performance.

3.3 HYPOTHESES

The following testable hypotheses were laid down for the present study.

i) There will be no significant differences between school and college students on perceptions of classroom environment, academic performance, and learning strategies.

ii) There will be no significant differences between science and non-science students on perceptions of classroom environment, academic performance, and learning strategies.

iii) There will be no significant differences between male and female students on perceptions of classroom environment, academic performance and learning strategies.

iv) There will be no significant interaction effect of institution types, stream and sex on different variables of perceptions of classroom environment, learning strategies and academic performance.

v) The intercorrelations among variables like perceptions of classroom environment, academic performance and learning strategies will not be significantly different for school and college students.

vi) The intercorrelations among variables like perceptions of classroom environment, academic performance and learning strategies will not be significantly different fro science and non-science students.

vii) The intercorrelations among variables like perceptions of classroom environment, academic performance will not be significantly different for male and female students.

viii) The variables like perceptions of classroom environment, academic performance, learning strategies and teacher styles for the students will not have significant intercorrelations.

3.4 POPULATION :

Students of Class XI from one college and two multipurpose schools in a rural area in West Bengal constituted the universe of population for this investigation. This was done for two reasons, namely:

i) students of this class usually were in the age group of 16+ years. By this time most of them were expected to have adopted a learning strategy with which they felt at ease. They were able to use hypthetical reasoning based on logic of all possible combinations and to perform control experiments in a limited way. Theoretically, these characteristics

developed during the fourth stage of cognitive development which was preparatory to adult thinking (Piaget and Inhelder, 1958).

ii) Students knew very well that their academic achievement at this stage will govern their future career such as choice of different competitions. The environmental pressure forced them to adopt definite learning strategies rather than be flexible all the time.

3.5 SAMPLING:

Purposive sampling method was used to select the sample. All the students of one section each of Arts, Science and Commerce of Class XI were taken. One class each in Arts, Science and Commerce were taken from

one college and from two multipurpose schools. All the teachers teaching to these classes were also taken as the sample of teachers.

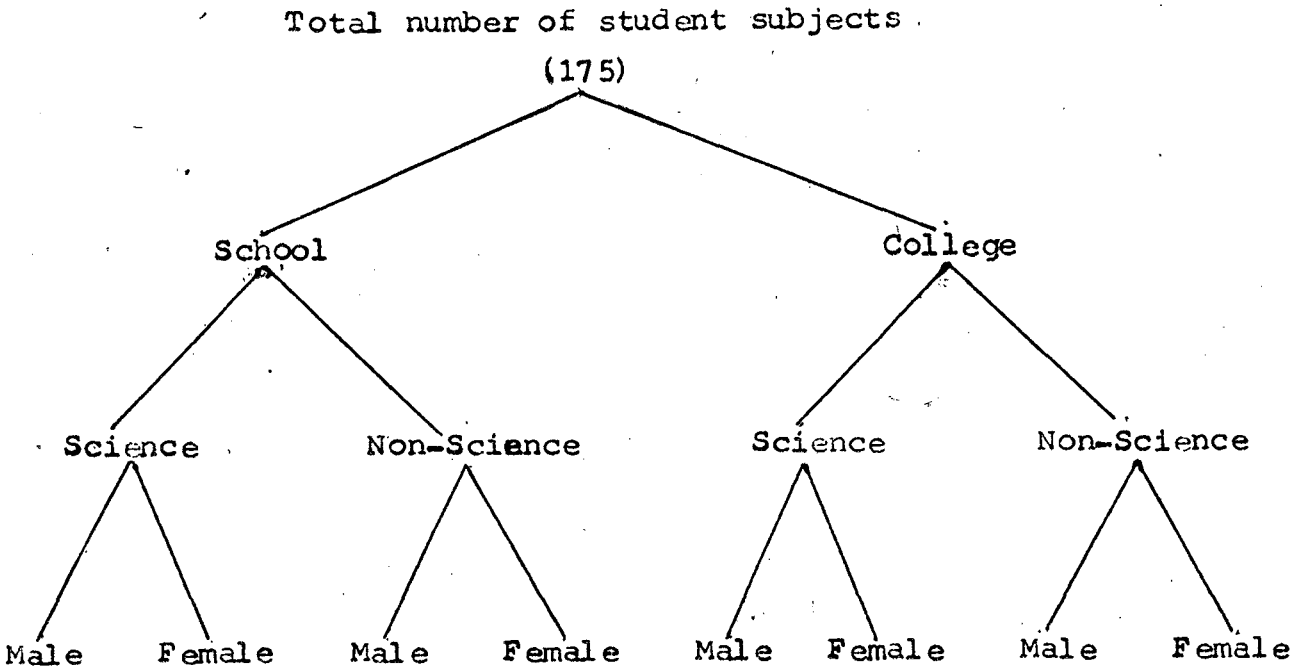
A total of 175 students and 54 teachers constituted the sample.

3.6 RESEARCH DESIGN:

In order to examine the relationships that might be existing among various variables, e.g., sex, institutions type, curriculum stream, classroom environment, learning strategy adopted by students.

A factorial design of the order of 2 x 2 x 2 having two institution types (school and college), two streams of education (science and non-science) and two sex (male and female) was used.

A diagramatic representation of the design may be presented as below:



Number of teachers included in the study were 54.

3.7 VARIABLES:

The variables included in the study may be enumerated as below:

Matching variables were - sex (boys and girls), types of institutions (school and college) and stream (science and non-science).

The present study attempted to explore the relationships between the teacher styles, learning strategies adopted by student and classroom environment.

The percentage of examination marks-the academic performance was also taken as one explantory variable.

3.8 DEFINITION OF IMPORTANT TERMS:

3.8.1 TEACHER STYLES:- Kirton's definition of teacher styles was used in this study. It was believed that teaching styles were determined by the dominant characteristics of the teacher. Those can range between highly adaptive to highly innovative on a continuum. Kirton's adaption-innovation theory (1986) categorized individuals as either adaptors or innovators by their preferences for distinct patterns of creativity, decision making and problem solving. Adaptors sought problem solving (preserving as much of the framework of the problem). Adaption-Innovation continuum comprised of three underlying individual difference constructs:

a) 'Originality' was the preference for generating many novel, unusual, or unique, ideas in response to a problem;

b) 'Efficiency' was the preference for detailed prudent, meticulous behaviours; and

c) 'Conformity' was the tendency to conform to prevailing rules or group norms.

Innovative person broke patterns of accepted modes of thought and action and was less conforming to rules, social norms and accepted work patterns. Innovators preferred new and different solutions to problems which disrupted rather than preserved the familiar patterns in which the problem existed.

Adaptors supported existing paradigms within which problems could be perceived. Adaptive persons were best fitted to work within set structures. They worked in impersonalized relationships; reducing conflict, minimizing risks and managing to solve problems by proceeding at a disciplined pace in a predictable direction. Adaptors preferred familiar methods and used existing principles to solve problems, preserving as much as possible of the existing context of the problem.

3.8.2 LEARNING STRATEGY:- The definition used in Entwistle was accepted. It had been argued that a full understanding occured only when the student could explain the topic by reconstructing it,

and could also demonstrate that understanding by applying the principles learnt to an entirely new situation (Pask, 1976).

'Deep Strategy' placed considerable emphasis on details and procedures. The deep approach was internal - to the contents of the article or problem, and to the knowledge, experience and interests of the learner. Students following this approach started with the intention of understanding the meaning of the article, interacted actively with the author's arguments (relating them to previous knowledge and their own experience) and tried to see to what extent the author's conclusions were justified by the evidence.

The 'surface strategy' was external towards the task and its requirements, and implied a process of learning in which alien material was to be impressed on the memory for a limited period and with the specific intention of satisfying external demands. There was no expectation that the content will become a continuing part of the learner's cognitive structure. Student's intention was to memorize the parts of the information they considered important, guided by the type of questions they anticipated would be asked subsequently.

The third main dimension was the achieving or 'strategic strategy' through which students sought to maximize their goals by strategic management of their time and intellectual resources in line with the perceived criterion of high grades.

3.8.3. CLASSROOM ENVIRONMENT:

Classroom Environment encompassed both external and internal learning conditions that contributed to the overall development of students. The classroom environment was conceptualized as the totality of social and psychological forces that influenced the functioning of the whole group and subgroups within the classes (Walberg, 1979). The social and psychological forces included three distinct but interacting dimensions. First, were the relationships that developed in classroom situation. Second was the goal orientation and personal development related features of environments. Third was the system maintenance and change dimension.

In brief, classroom environment affecting a group was thought as the product of interactions among external learning conditions, personality characteristics of individual learners and the institutionalised norms, values and culture.

3.9 TOOLS USED:

The following tools were used for measuring different variables.

1. Classroom Environment Inventory.
2. Kirton's Adaptor-Innovator Inventory.
3. Approaches to Studying Inventory.
4. School/College Register for examination marks.

3.10 DESCRIPTION OF TOOLS:

3.10.1 CLASSROOM ENVIRONMENT INVENTORY

The classroom environment was the total outcome of a number of variables like the external conditions of learning, the personality characteristics of individual learner and the institutionalised norms, values and culture. Some of the aspects of classroom life like the feelings and mutual respect students shared among themselves and with teachers, student involvement in classroom culture, and attitude towards the academic

orientation etc. contributed to the understanding of classroom environment. Specific dimensions of classroom environment were as follows:-

1. Personalization:-

The emphasis on opportunities for students to interact with the teacher and concern for students' welfare.

2. Involvement:-

The extent to which students participated actively and attentively in class discussions and activities.

3. Student cohesiveness:-

The extent to which students knew, helped and were friendly toward each other.

4. Satisfaction:-

The extent of enjoyment in classes.

5. Task orientation:-

The extent to which class activities were clear and well organized.

6. Innovation:-

The extent to which teachers planned new, unusual class activities, techniques and assignments.

7. Individuation:-

The extent to which students were allowed to make decisions and were treated differentially according to ability, interest or rate of working.

Using the above dimensions of classroom environment, an inventory was devised by Fraser (1986) to assess the characteristics of classroom environment. This inventory was later modified by Das (1987). The original inventory consisted of 49 items in total, where as the modified inventory consisted of 21 items. This classroom environment inventory used a four point response scale. The classroom environment inventory used by Das was used in this study. Former study had yielded strong internal reliability estimates (Fraser, 1986).

Scoring procedure:-

Items 1,2,5,6,7,9,13,15,16,18,20 and 21 were scored 1,2,3 and 4 respectively for the responses strongly agree, agree, disagree and strongly disagree. All other items (e.g. 3,4,8,10,11,12,14,17 and 19) were scored in reverse manner viz. 4,3,2 and 1 for the response strongly agree, agree, disagree and strongly disagree. Omitted or invalidly answered items were scored as 0 (zero). A copy of the classroom environment inventory is attached in Appendix-I.

3.10.2. APPROACHES TO STUDY INVENTORY:

As said earlier approaches to study include three strategies-Deep approach, Surface approach and Strategic approach, and one 'Style and pathology.'

An inventory was devised by Ramsden (1983) to assess the characteristic ways of students' learning. This inventory was modified to a small extent in the present study. The original

inventory consisted of 64 items in total whereas the modified one consisted of 48 items.

The specific dimensions of approaches to studying inventory were as follows:-

1. Meaning orientation having subscales, deep approach, relating ideas, use of evidence and intrinsic motivation.

   This was taken as 'deep strategy'.

2. Reproducing Orientation having subscales, surface approach, syllabus-boundness, fear of failure and extrinsic motivation.

   This was taken as 'surface strategy'.

3. Achieving Orientation having subscale, strategic approach, disorganised study methods, negative attitudes to studying, achievement motivation.

   This was taken as 'Strategic strategy'.

4. Styles and Pathologies of learning having subscales, comprehension learning, globetrotting, operation learning and improvidence.

The approaches to studying inventory used a three point response format. Reliabilities obtained by Speth and Brown (1988) for the four subscales of ASI

(Meaning, Achieving, Reproducing and Non-Academic) ranged from 0.58 to 0.73, similar to those reported by Ramsden (1983) and Entwistle and Waterston (1985).

Scoring Procedure:

All the items were scored 3,2 and 1 respectively for responses Yes (Y), Unsure (?) and No.(N). A copy of the ASI is attached in Appendix-2.

3.10.3 (KAI) KIRTON'S ADAPTION INNOVATION INVENTORY,1977.

Adaption-Innovation was measured with 32 item Kirton adaption-innovation inventory (Kirton, 1977). The reliability index of the inventory as given by Kirton(1976) was .88. Formen studies had also yielded strong internal reliability estimates (Mulligan and Martin, 1980; Goldsmith, 1985). Innovators received high scores on the three subscales: Originality, conformity and efficiency. Each item was scored by the subject on a four point scale, giving a theoritical range of scores from 32 to 128, with a mean of 80. A copy of the KAI is attached in Appendix - 3.

3.10.4. EXAMINATION MARKS:

One set of examination marks was taken as the indicator of student's performance.

3.11 ORGANISATION OF THE FINAL STUDY:

To the extent it was possible, care was taken to follow the specified procedure in order to test the above hypotheses. As indicated earlier - one co-educational college and two co-educational schools were selected.

As a first step Principal of the college and Headmasters of the respective schools were approached for permission to administer scales. Appointments were made with the help of the class teacher the researcher administered the scale. The teacher in charge of the class helped the researcher in maintaining discipline, and explaining instructions.

Classroom Environment Inventory and approaches to study inventory were administered during the classes. After giving a brief summary,

description about the nature and purpose of the test, the inventories were administered to the students. The researcher and the classroom teacher in each class were presnt all the time during the administration of the inventory. Necessary explanations whenever needed were giving in native language to the students. The following instructions were given to the subjects.

1. Classroom Environment Inventory:

"The purpose of this scale is to find out your opinion about the class you are attending right now. This questionnaire assesses your opinion about what this class is actually like. Indicate your opinion by responding to each questionnaire statement by circling the right responses (e.g., (a), (b)). You are requested to choose one out of the four alternatives like SA, A, D, and SD respectively for the response, strongly agree, agree, disagree and strongly disagree".

2. Approaches to Study Inventory:

This scale consists of 48 statements.

"The purpose of this scale is to find out the learning strategy you adopt for learning at school/college.

Please read out statement at a time and indicate your response by putting a tickmark (✓). You are requested to choose one out of the three alternatives like 'Y', '?' and 'N' respectively for response - 'yes', 'unsure' and 'No'".

3. Kirton's Adaptor Innovator Inventory (KAI):

This scale was administered to the teachers individually, teaching the selected classes.

The following instructions were given to the teacher:

" This questionnaire assesses your opinion about your self. Please indicate your opinion about each questionnaire statement by circling: For example: (SA), (A), (D) or (SD), SA -if your strongly agree, A - if you agree, D - if you disagree, and SD if you strongly disagree."

After the respondents finished marking the scale the researcher collected all the questionnaires given.

3.12 CODING:

Scoring was done individually for each questionnaire. The scoring was carried out in the manner as mentioned earlier. The data were then coded on scoring sheet.

3.13 ANALYSIS OF DATA:

Means, Standard deviations, t-test and ANOVA were calculated using the variables (e.g. institution type, sex, curriculum, classroom environment).

Correlational analysis was done to findout the relationships among different variables (e.g. sex, Institution type, Curriculum, Classroom Environment, Learning Strategy, Examination Marks for students; and

and SES, Income, Sex, Types of institutions and teacher styles for teachers).

Factor analysis for Teacher styles and learning strategy scales were done separately.

CHAPTER - IV

RESULTS

The following statistical analysis were carried out on the data collected for this investigation:

4.1 Analysis of the Mean differences (t-test) for teachers.

4.2 Analysis of the Mean differences (t-test) for students.

4.3 Analysis of variance for students.

4.4 Correlational analysis for students.

4.5 Correlational analysis for teachers.

4.6 Factor analysis of AS Inventory.

4.7 Factor analysis of KAI Inventory.

4.1 MEAN DIFFERENCES FOR TEACHERS:-

For teachers, the t-test analysis was performed to find out sex, institution type and stream related differences in scores on teaching experience, teacher styles and SES. These are discussed below.

4.1.1. Mean differences by institution types:-

Mean differences by institution types are included in Table 1.

TABLE -1: Means, SDs and t values for School and College Teachers.

Variable	School (N=33)		College (N=21)		t	p
	M	S.D.	M	S.D.		
Teaching Experience	15.0	10.99	17.24	11.33	.75	NS
Teacher Styles	98.03	10.24	98.48	10.68	.15	NS
S.E.S.	4.03	.77	4.52	1.33	1.53	NS

N.S. - Not significant

On teaching experience, teacher styles and SES, mean differences were not significant. These results exhibited that school teachers did not score differently than college teachers on teaching experience, teacher styles and SES. They had comparable SES and experience and adopted similar teacher styles.

4.1.2 Mean differences by streams:

Mean differences by stream are included in Table 2.

TABLE-2: Means, SDs and 't' values for Science and Non-Science Teachers.

Variable	Science (N=25) M	SD	Non-Science (N=29) M	SD	t	p
Teaching Experience	13.28	10.20	18.1	11.47	1.63	NS
Teacher styles	97.16	8.47	99.10	11.75	.70	NS
SES	4.24	1.09	4.21	1.01	.10	NS

N.S. - Not significant

Mean differences between science and non-science teachers on teaching experience, teacher styles and SES were not significant. These results exhibited that science teachers did not score differently than non-science teachers on teaching experience, teacher styles and SES.

4.1.3 Mean differences by Sex:-

Mean differences by sex are included in Table-3.

TABLE-3: Means, SDs and 't' values for Male and Female teachers.

Variable	Male (N=43) M	SD	Female (N=11) M	SD	t	p
Teaching Experience	17.35	10.97	10.09	9.90	2.12	*
Teacher styles	97.93	10.84	99.27	8.31	.45	NS
SES	4.14	1.01	4.55	1.13	1.1	NS

N.S. = Not significant, * = Significant at the .05 level.

Mean differences between male and females on teacher styles and SES were not significant. The female teachers did not score differently than males on teacher styles and SES. However, the mean differences between males and females on teaching experience was significant at the .05 level. It was observed that males included in the sample had more teaching experience than females.

4.2 MEAN DIFFERENCES FOR STUDENTS:

For students 't' test analysis was done to find out the differences between perceptions of classroom environment, learning strategies adopted by the students and academic performance.

4.2.1 Mean differences for the students by Institution Types.

Mean differences for the students by Institution types are included in Table-4

TABLE-4: Means, SDs and 't' values by Institution Types.

Variable	School (N=87) M	SD	College (N=88) M	SD	t	p
Personal-ization	9.47	1.95	8.93	1.94	1.84	NS
Involvement	9.92	1.57	9.65	1.67	1.10	NS
Student cohesiveness	9.46	2.16	9.51	2.33	.15	NS
Satisfaction	10.75	1.30	10.19	1.96	2.23	*
Task-orientation	9.18	1.77	8.52	2.01	2.25	*
Innovation	9.78	1.93	9.06	1.96	.61	NS
Individuation	8,07	1.48	8.06	1.72	.04	NS
Perceptions of classroom environment	66.63	5.78	64.48	7.42	2.14	*
Academic performance	48.48	7.25	45.52	5.79	2.98	**
ASI Score	66.74	6.09	66.93	6.66	.19	NS
Deep strategy	22.48	2.25	21.44	2.66	2.08	**
Surface strategy	12.16	3.48	12.48	3.16	.24	NS
Strategic strategy	16.02	3.10	17.10	2.92	2.37	*
Styles & pathology	16.07	3.05	16.12	2.92	.11	NS

N.S. - Not significant,
* - $P < .05$,
** - $P < .01$.

Mean differences between scores of school and college students were not significant on personalization, involvement, student cohesiveness, innovation, individuation, total ASI score, surface strategy and styles & pathology. These results revealed that college students did not score differently than school students on above aspects. However the mean differences between the school and college students were significant at the .05 level on satisfaction, task orientation, perceptions of classroom environment and strategic strategy. The mean differences between the school and college students were significant at the .01 level on academic performance and deep strategy.

It was observed that school students had higher scores on satisfaction, task orientation, perceptions of classroom environment, academic performance and deep strategy. These indicated that school students perceived classroom environment better and adopted deep strategy more often than college students, so they also achieved higher in academic performance.

4.2.2. MEAN DIFFERENCES FOR THE STUDENTS BY STREAMS:

Mean differences for the students by streams are included in Table-5.

TABLE5: Means, SDs and t values for Science and Non-science students

Variable	Science (N=62)		Non-Science (N= 113)			
	M	SD	M	SD	t	p
Personali-zation	8.67	2.05	8.93	1.94	.82	NS
Involvement	9.87	1.54	9.65	1.67	.69	NS
Student Cohesiveness	8.09	2.12	9.51	2.33	1.76	NS
Satisfaction	10.05	1.75	10.19	1.96	.49	NS
Task-orientation	8.26	1.98	8.52	2.01	.81	NS
Innovation	9.04	2.04	9.06	1.97	.63	NS
Individuation	7.09	1.53	8.06	1.72	.63	NS
Perceptions of classroom environment	63.05	7.01	64.48	7.42	1.27	NS
Academic Performance	51.35	8.52	45.52	5.79	4.82	**
ASI Score	65.81	5.45	66.94	6.66	1.22	NS
Deep Strategy	21.84	2.64	21.44	2.66	.95	NS
Surface Strategy	11.76	3.04	12.28	3.16	1.41	NS
Strategic Strategy	17.10	2.49	16.19	2.92	2.17	*
Styles & Pathology	16.02	2.63	16.12	2.92	.23	NS

* = Significant at the .05 level,
** = Significant at the .01 level,
NS = Not Significant.

Mean differences between the Science and Non-science students were not significant on personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, perceptions of classroom environment, ASI score, deep strategy, surface streategy and styles and pathology. These results exhibited that science students did not score differently than non-science students on above aspects. However the mean difference between the science and non-science students on strategic strategy was significant at the .05 level. Moreover the mean difference on academic performance was significant at the .01 level.

It was observed that science students scored higher on strategic strategy and academic performance. Irrespective of the perceptions of classroom environment science students adopted strategic strategy in general and achieved well in academic performance than the non-science students.

4.2.3 MEAN DIFFERENCES FOR THE STUDENTS BY SEX:

Mean differences for the students by sex are included in Table-6.

TABLE- 6: Means, SDs and t values for Male and Female Student.

Variable	Male (N=111) M	SD	Female (N=64) M	SD	t	p
Personalization	8.22	1.83	9.91	1.76	6.04	**
Involvement	9.41	1.58	10.28	1.56	3.54	**
Student cohesiveness	9.07	2.32	9.69	2.14	1.79	NS
Satisfaction	9.79	2.02	10.75	1.46	3.64	**
Task-orientation	8.32	2.17	8.63	1.83	1.01	NS
Innovation	9.05	1.78	10.38	2.05	4.32	**
Individuation	7.73	1.62	8.48	1.62	2.94	**
Perceptions of classroom environment	61.59	6.73	68.11	6.34	6.41	**
Academic Performance	46.02	8.00	48.39	6.06	2.04	*
ASI Score	65.09	6.07	67.64	6.47	1.75	NS
Deep Strategy	21.04	2.72	22.53	2.27	3.88	**
Surface strategy	12.30	3.16	11.75	3.04	1.14	NS
Strategic strategy	16.53	2.94	17.20	2.51	1.45	NS
Styles & pathology	16.04	2.65	16.16	3.09	0.17	NS

* = Significant at the .05 level,
** = Significant at the .01 level.

Mean differences between the males and females were not significant at the .05 level on student cohesiveness, task orientation, ASI score, surface strategy, strategic strategy and styles and pathology. These results exhibited that females did not differently than males on above aspects. However the mean differences between males and females were significant at the .01 level on personalisation, involvement, satisfaction, innovation, individuation, perceptions of classroom environment and deep strategy. Moreover the mean differences between the males and females were significant at the .05 level on academic performance.

These indicated that female students perceived classroom environment better, they adopted deep strategy in learning and achieved better in academic performance than male students.

4.3 ANALYSIS OF VARIANCE BY INSTITUTION TYPES, STREAM AND SEX:

Data had been analysed for variance within the framework of 2 x 2 x 2 (Institution typesx stream x sex) factorial design to test the main as well as interaction effects of these factors on personalisation, involvement, student cohesiveness, satisfaction, task-orientation, innovation, individuation, perceptions of classroom environment, academic performance, ASI score, deep strategy, surface strategy,

strategic strategy, and styles and pathology. The first factor was institution types(school and college). The second factor comprised two streams of education (science and non-science). The third factor was the sex of students (male and female).

Results of analysis of variance (ANOVA) are included in Tables 7 to 20.

4.3.1 Summary of ANOVA for Personalization:

Table-7 includes the results of analysis of variance by institution type, stream and sex using personalisation as the dependent variable.

TABLE-7: Analysis of variance by institution type, stream and sex on Personalisation.

Source of Variance	Sum of Squares	df	MS	F	P
IT	12.04	1	12.04	3.04	NS
St	.38	1	.38	.09	NS
S	27.44	1	27.44	6.93	.01
IT x St	.67	1	.67	.17	NS
IT x S	.67	1	.67	.17	NS
St x S	.67	1	.67	.17	NS
IT x St x S	.04	1	.04	.01	NS

IT - Institution Type; St - Stream; S-Sex.

Results indicated that the main effects of institution types and stream on personalisation were not significant at the .05 level. This meant that institution types and streams had no significant influence on personalisation. The main effect of sex on personalisation was significant at the .01 level meaning that sex as an independent variable had significant influence on personalisation. The interaction effects of institution type and stream, institution type and sex, sex and stream, and institution type, sex and stream were not significant, indicating that the combined effects had no significant influence on personalisation.

4.3.2 Summary of ANOVA for Involvement.

Table-8 includes the results of analysis of variance by institution types, stream and sex using involvement as criterion variable.

TABLE-8: Analysis of variance by institution type, stream and sex on involvement.

Source of Variance	Sum of squares	df	MS	F	P
IT	3.01	1	3.01	1.26	NS
ST	.26	1	.26	.12	NS
S	15.38	1	15.38	6.93	.01
IT x St	.26	1	.26	.12	NS
IT x S	7.59	1	7.59	3.42	NS
St x S	3.76	1	3.76	1.70	NS
IT x St x S	.84	1	.84	.38	NS

IT = Institution type; St= Stream; S= Sex.

The main effects of institution types and streams on involvement were not significant. This meant that involvement was comparable across institution types and streams. However, the main effect of sex on involvement was significant at the .01 level, meaning that sex as an independent variable had some influence on involvement. The interaction effects of institution types and streams, streams and sex, institution type and sex, and institution type, stream and sex on involvement were also not significant meaning that the combined effect had no significant influence on involvement.

4.3.3. Summary of ANOVA for Student Cohesiveness.

Table-9 includes the results of analysis of variance by institution types, stream and sex using student cohesiveness as criterion variable.

TABLE-9: Analysis of variance by institution type, stream and sex on student cohesiveness.

Sources of variance	Sum of squares	df	MS	F	p
IT	12.04	1	12.04	2.69	NS
St	7.04	1	7.04	1.57	NS
S	7.04	1	7.04	1.57	NS
IT x St	1.04	1	1.04	.23	NS
IT x S	7.04	1	7.04	1.57	NS
ST x S	.04	1	.04	.01	NS
IT x St X S	1.04	1	1.04	.23	NS

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types, streams and sex on student cohesiveness were not significant, meaning that student cohesiveness was at the same level in all groups. The interaction effects of institution types and streams, streams and sex, institution types and sex,and institution type, stream and sex on student cohesiveness were not significant. This meant that when institution type, stream and sex interacted together the variations in student cohesiveness were found levelled.

4.3.4 Summary of ANOVA for Satisfaction..

Table-10 includes the results of analysis of variance by institution type, stream and sex using satisfaction as criterion variable.

TABLE-10: Analysis of variance by institution type, stream and sex on satisfaction.

Sources of Variance	Sum of Squares	df	MS	F	P
IT	14.37	1	14.37	3.96	.05
St	6.51	1	6.51	1.79	NS
S	25.11	1	25.11	6.92	.01
St x IT	1.26	1	1.26	.35	NS
S x IT	.01	1	.01	.003	NS
St x S	1.76	1	1.76	.48	NS
IT x St X S	2.34	1	2.34	.65	NS

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types and sex on satisfaction were significant. The main effect of streams on satisfaction was not significant. This meant that satisfaction was not significantly influenced by streams while it was highly influenced by sex and type of institutions - as independent variables. The interaction effects of institution types and stream, stream and sex, institution types and sex, and institution types, stream and sex on satisfaction were not significant. This meant that combined effects of institution types, streams and sex had no significant influence on satisfaction.

4.3.5 Summary of ANOVA for Task Orientation.

Table-11 includes the results of analysis of variance by institution types, stream and sex using task orientation as criterion variable.

TABLE-11: Analysis of variance by institution types, stream and sex on task-orientation..

Source of variance	Sum of Squares	df	MS	F	P
IT	15.33	1	15.33	3.95	.05
St	.51	1	.51	.13	NS
S	.84	1	.84	.22	NS
IT x St	.09	1	.09	.02	NS
IT x S	.09	1	.09	.02	NS
St x S	.51	1	.51	.13	NS
IT x St x S	2.34	1	2.34	.60	NS

IT= Institution type; St= Stream; S= Sex.

The main effect of institution types on task orientation was significant at the .05 level. This meant that task orientation was significantly influenced by institution types. The main effects of streams and sex were not significant, meaning that task orientation was not significantly influenced either by stream or by sex. The interaction effects of institution types and stream, stream and sex, institution type and sex, and institution type, stream and sex were not found significant.

4.3.6 Summary of ANOVA for Innovation.

Table-12 includes the results of analysis of variance by institution types stream and sex using innovation as criterion variable.

TABLE-12: Analysis of variance by institution types, stream and sex on innovation.

Sources of variance	Sum of Squares	df	MS	F	P
IT	2.67	1	2.67	.63	NS
St	.67	1	.67	.16	NS
S	29.41	1	29.41	6.92	NS
IT x St	1.05	1	1.05	.35	.01
IT x S	.17	1	.17	.04	NS
St X S	2.67	1	2.67	.63	NS
IT x St x S	28.17	1	28.17	6.62	.05

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types and streams were not significant on innovation. These meant that innovation was not significantly influenced by institution types and stream respectively. The main effect of sex on innovation was significant. This meant that innovation level was different among males and females. The interaction effects of institution types and stream, stream and sex, and institution types and sex were not significant. These meant that institution type, stream and sex did not interact actively on innovation. However, the interaction of institution type, stream and sex on innovation was significant, meaning that at a level institution type, stream and sex interacted and had a significant influence on innovation.

4.3.7 Summary of ANOVA for Individuation.

Table-13 includes the results of analysis of variance by institution types, stream and sex using individuation as criterion variable.

TABLE-13: Analysis of variance by institution type, stream and sex on individuation.

Sources of variance	Sum of squers	df	MS	F	p
IT	.01	1	.01	.004	NS
St	1.26	1	1.26	.49	NS
S	17.95	1	17.95	6.93	.01
IT x St	.84	1	.84	.33	NS
IT x S	.84	1	.84	.33	NS
St x S	10.01	1	10.01	3.86	NS
IT x S x St	1.26	1	1.26	.49	NS

IT= Institution type; St= Stream; S = Sex.

The main effects of institution types and stream on individuation were not significant. This meant that individuation was comparable among students across institution types and streams. The main effect of sex on individuation was significant at the .01 level. This meant that individuation was highly influenced by sex. The interaction effects of institution type and stream, stream and sex, institution type and sex, and institution type, stream and sex on individuation were not significant, indicating that there were no combined effects of institution types, streams and sex on individuation.

4.3.8 Summary of ANOVA for Perceptions of Classroom Environment.

Table-14 includes the results of analysis of variance by institution type, stream, and sex using perception of classroom environment as criterion variable.

TABLE-14: Analysis of variance by institution type, stream and sex on perceptions of classroom environment.

Sources of variance	Sum of squares	df	MS	F	p
IT	213.25	1	213.25	3.96	.05
St	80.67	1	80.67	1.49	NS
S	373.18	1	373.18	6.93	.01
IT x St	1.05	1	1.05	.03	NS
IT x S	26.04	1	26.04	.48	NS
IT x St x S	57.04	1	57.04	1.06	NS

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types on perceptions of classroom environment were significant. This meant that perceptions of classroom environment varied across institution types. Also classroom environment was differently perceived by males and females. The main effect of stream was not significant. The interaction effects of institution type and stream, stream and sex, institution type and sex and institution type, stream and sex were not significant meaning that classroom perceptions was not significantly varied across stream. This also perhaps neutralised the interactive effects of institution types, sex and streams.

4.3.9. Summary of ANOVA for Academic Performance.

Table-15 includes the results of analysis of variance by institution type, stream and sex using academic performance as the dependent variable.

TABLE-15: Analysis of variance by institution type, stream and sex on academic performance.

Sources of variance	Sum of squares	df	MS	F	P
IT	392.63	1	392.63	7.0	.01
St	388.70	1	388.70	6.93	.01
S	222.12	1	222.12	3.96	.05
IT x St	33.84	1	33.84	.60	NS
IT x S	23.01	1	23.01	.41	NS
St x S	.84	1	.84	.02	NS
IT x St x S	6.5	1	6.05	.12	NS

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types and streams on academic performance were significant. This meant that academic performance varied across institution types and streams. The main effect of sex on academic performance was also significant meaning males performed differently than females. The interaction effects of institution types and stream, stream and sex, and institution type, stream and sex on academic performance were not significant. This meant that variables interacted in opposite directions and neutralised the effects.

4.3.10 Summary of ANOVA for ASI (Approaches to study Inventory) Score.

Table-16 includes the results of analysis of variance by institution type, stream and sex using ASI score as dependent variable.

TABLE-16: Analysis of variance by institution type, stream and sex on ASI score.

Sources of variance	Sum of squares	df	MS	F	p
IT	256.76	1	256.76	6.67	.05
St	4.59	1	4.59	.12	NS
S	31.51	1	31.51	.82	NS
IT x St	114.84	1	114.84	2.98	NS
IT x S	23.01	1	23.01	.60	NS
St X S	3.76	1	3.76	.10	NS
IT x St x S	11.34	1	11.34	.29	NS

IT = Institution type; St= Stream; S=Sex.

The main effect of institution types of ASI was significant. This meant that approaches to study were significantly different across institution types. The main effects of stream and sex on ASI were not significant. The interaction effects of institution type and stream, stream and sex, institution type and sex, and institution type, stream and sex on approaches to study were not significant. This meant that the combined effects of institution type and stream, stream and sex, institution type and sex, and institution type, stream and sex had no significant influence on approaches to study.

4.3.11 Summary of ANOVA for Deep Strategy.

Table-17 includes the results of analysis of variance by institution type, stream and sex using deep strategy as the dependent variable.

TABLE-17: Analysis of variance by Institution type, stream and sex on deep strategy.

Sources of variance	Sum of squares	df	MS	F	P
IT	37.90	1	37.90	6.98	.01
St	21.09	1	21.09	3.88	NS
S	37.63	1	37.63	6.93	.01
IT x St	.01	1	.01	.002	NS
IT x S	4.59	1	4.59	.85	NS
ST x S	.84	1	.84	.16	NS
IT x St x S	3.01	1	3.01	.55	NS

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types and sex on deep strategy were highly significant. This meant that deep strategy was differentially adopted by students of institution types and sex. The main effect of stream on deep strategy was not significant. This meant that vary few students is any stream could not adopt deep strategy. The interaction effects of institution type and stream, stream and sex, institution types and sex, and institution types, stream and sex on deep strategy were not significant. The combined effects of institution types, stream and sex influences perhaps acted in a manner so as to neutralise each others' impact.

4.3.12 Summary of ANOVA for Surface Strategy.

Table-18 includes the results of analysis of variance by institution types, stream and sex using surface strategy as dependent variable.

TABLE-18: Analysis of variance by institution types, stream and sex on surface strategy.

Sources of Variance	Sum of squares	df	MS	F	P
IT	9.38	1	9.38	.90	NS
St	8.17	1	8.17	.78	NS
S	.17	1	.17	.02	NS
IT x St	15.04	1	15.04	1.43	NS
IT x S	.04	1	.04	.001	NS
St x S	1.05	1	1.05	.14	NS
IT x St x S	2.04	1	2.04	.19	NS

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types, stream and sex were not significant on surface strategy. These meant that the adopting of surface strategy was not different by institution types, stream and sex. The interaction effects of institution types and stream, stream and sex, institution types and sex and institution types, stream and sex were not signficant on surface strategy.

4.3.13 Summary of ANOVA for Strategic Strategy.

Table-19 includes the results of analysis of variance by institution types, stream and sex using strategic strategy as criterion variable.

TABLE-19: Analysis of variance by institution types, stream and sex on strategic strategy.

Sources of variance	Sum of Squares	df	MS	F	P
IT	25.58	1	25.58	3.96	.05
St	25.71	1	25.71	3.98	.05
S	8.76	1	8.76	1.36	NS
IT x St	11.34	1	11.34	1.76	NS
IT x S	7.59	1	7.59	1.18	NS
St x S	.09	1	.09	.01	NS
IT x St x S	2.34	1	2.34	.36	NS

IT = Institution type; St= Stream; S= Sex.

The main effects of institution types and stream on strategic strategy were significant at the .05 level. These meant that the choice of strategic strategy was significantly different across institution types and streams. The interaction effects of institution types and stream, stream and sex, institution types and sex, and institution types, stream and sex on strategic strategy were not significant. The interactive effects of institution types and stream, stream and sex, institution types and sex, and institution types, stream and sex had hardly any effect on strategic strategy.

4.3.14 Summary of ANOVA for Styles & Pathology.

Table-20 includesthe results of analysis of variance by institution types, stream and sex using styles and pathology as dependent variable.

TABLE-20: Analysis of variance by institution types, stream and sex on styles & pathology.

Sources of variance	Sum of squares	df	MS	F	p
IT	15.84	1	15.84	1.88	NS
St	14.26	1	14.26	1.69	NS
S	1.26	1	1.26	.15	NS
IT x St	12.76	1	12.76	1.28	NS
IT x S	.01	1	.01	.001	NS
St x S	.26	1	.26	.03	NS
IT x St x S	2.34	1	2.34	.28	NS

IT= Institution type; St= Stream; S= Sex.

The main effects of institution types, stream and sex on styles and pathology were not significant at the .05 level. These meant that the choice of styles and pathology were not significantly different across institution types, stream and sex. The interaction effects of institution types and stream, stream and sex, institution types and sex, and institution types, streams and sex on styles and pathology were not significant. These meant that the combined effects of institution types and stream, stream and sex, institution types and sex, and institution types, stream and sex had no significant influence on styles and pathology.

4.4 CORRELATIONAL ANALYSIS FOR STUDENTS:

In order to investigate the relationship among different variables the correlations were computed. Pearson correlation co-efficients (r) were calculated to determine the extent of relationship among numerous variables, namely personalization, involvement, student cohesiveness, satisfaction, task-orientation, innovation, individuation, perceptions of cleassroom environment, academic performance, ASI score, deep strategy, surface strategy, strategic strategy, styles and pathology and teacher styles. The co-efficients of correlation were computed separately for school, college, science, non-

science, male and female students. The correlation trices for various groups of students are presented in Tables 21-26.

4.4.1 Correlations for school students

The correlations among different variables calculated over the sample of school students are included in Table-21.

TABLE-21: Intercorrelation Matrix on classroom environment, learning strategies and academic performance for school students.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Personalization														
Involvement	09													
Student Cohesiveness	-01	**45												
Satisfaction	-15	*-25	.05											
Task Orientation	16	-01	-02	06										
Innvation	**56	*22	14	*-24	*23									
Individuation	-02	-18	-03	06	*21	*25								
Perceptions of Classroom onvironment	**55	**44	**53	08	**50	**71	**35							
Academic Performance	**-37	08	**28	-15	-13	**-44	-07	**-49						
ASI Score	07	**-31	-13	*21	*23	01	02	01	-19					
Deep Strategy	05	11	04	**33	**35	03	01	*25	-16	**29				
Surface Strategy	06	**-41	**-37	18	04	-04	-05	-20	-10	**72	-04			
Strategic Strategy	**22	-13	14	-07	02	18	17	19	-14	**53	-20	20		
Styles& pathology	-18	-18	-04	10	20	-14	-08	-11	-06	**69	16	**31	09	

* Significant at the .05 level
** Significant at the .01 level

Decimal points are not given for the sake of convenience.

The correlations of deep strategy with personalisation, involvement, student cohesiveness, satisfaction, task orientation, innovation, perception of classroom environment and academic performance were ($r = .05$, $p > .05$), ($r = .11$, $p > .05$), ($r = .04$, $p > .05$), ($r = .33$, $p < .01$), ($r = .35$, $p < .05$) ($r = .03$, $p > .05$) ($r = .01$, $p > .05$), ($r = .25$, $p < .05$) and ($r = .16$, $p > .05$) respectively. These implied that the associations of deep strategy with personalisation, involvement, student cohesiveness, innovation and individuation were positive but not significant. The relations of deep strategy with satisfaction and task orientation were positive and highly significant. The relation between deep strategy with perceptions of classroom environment was positive and significant. The relation between deep strategy with academic performance was negative but not significant.

The correlations of surface strategy with personalisation, involvement, student cohesiveness, satisfaction and task orientation, innovation, individuation perceptions of classroom environment and academic performance were ($r = .06$, $p > .05$), ($r = -.41$, $p < .01$), ($r = -.37$, $p < .01$), ($r = .18$, $p > .05$) ($r = .04$, $p > .05$), ($r = -.04$, $p > .05$), ($r = -.20$, $p > .05$), ($r = -.20$, $p > .05$) and ($r = -.10$, $p > .05$) respectively. These implied that the associations of surface strategy with personalisation,

satisfaction and task orientation were positive and not significant. The relations of surface strategy with involvement and student cohesiveness were negative and highly significant. The relations of surface strategy with innovation, individuation, perceptions of classroom environment and academic performance were negative and not significant.

The correlation of strategic strategy with personalisation, involvement, student co-hesiveness, satisfaction, task-orientation, innovation, individuation, perceptions of classroom environment, academic performance, and styles and pathology were ($r = .22$, $p < .05$), ($r = -.13$, $p > .05$), ($r = .14$, $p > .05$), ($r = -.07$, $p > .05$), ($r = .02$, $p > .05$), ($r = .18$, $p > .05$), ($r = .17$, $p > .05$), ($r = .19$, $p > .05$), ($r = -.14$, $p > .05$) and ($r = .09$, $p > .05$) respectively. The association of strategic strategy with personalisation was positive and significant. The relations of strategic strategy with student cohesiveness, task orientation, innovation, individuation and styles and pathology were positive and not significant. The relations of strategic strategy with involvement, satisfaction and perceptions of

classroom environment were negative and not significant.

The correlation of styles and pathology with personalisation, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were not significant. The relations of styles and pathology with satisfaction and task orientation were positive and not significant.

4.4.2 Correlations for college students.

The correlations for different variables calculated over the sample of college students are included in Table 22.

TABLE-22: Intercorrelation matrix on classroom environment, learning strategies and academic performance for college students.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Personalisation														
Involvement	**34													
Student cohesiveness	09	*25												
Satisfaction	15	**33	**37											
Task Orientation	-06	-11	09	01										
Innovation	18	**38	**29	*40	02									
Individuation	*24	**36	00	**35	08	*23								
Perceptionsof Classroom environment	**47	**62	**59	**69	**28	*65	**55							
Academic performance	-07	-03	-01	-15	15	-03	11	-06						
ASI Score	08	17	*27	**32	14	16	12	**34	-10					
Deep Strategy	14	**39	**41	**51	09	**37	12	**54	-09	**60				
Surface Strategy	-20	**-27	-03	-17	10	-18	-16	*-22	13	**43	-13			
Strategic Strategy	-06	08	09	08	03	-02	16	10	*22	**63	20	-04		
Styles& pathology	**30	17	11	*26	08	17	15	**32	-11	**62	20	05	10	

* Significant at the .05 level
** Significant at the .01 level

Decimal points are not given for the sake of convenience.

The correlation of deep strategy with personalisation, involvement, student cohesiveness, task orientation, innovation, individuation, perceptions of classroom environment, academic performance and styles and pathology were ($r = .14$, $p > .05$), ($r = .39$, $p < .01$), ($r = .41$, $p < .01$), ($r = .51$, $p < .01$), ($r = .09$, $p > .05$), ($r = .37$, $p < .01$), ($r = .12$, $p > .05$), ($r = .54$, $p < .01$), ($r = -.09$, $p > .05$) and ($r = .20$, $p > .05$) respectively. These implied that the associations of deep strategy with personalisation, task orientation, individuation and styles & pathology were positive and not significant. The relation between deep strategy and academic performance was negative and not significant. The associations of deep strategy with student cohesiveness, involvement, satisfaction, innovation and perceptions of classroom environment were positive and highly significant.

The associations of surface strategy with personalisation, student cohesiveness, satisfaction, innovation were negative and not significant. The relations of surface strategy with task orientation and academic performance were positive and not significant. The relation between surface strategy and involvement was negative and highly significant. The relation between surface strategy and perceptions of classroom environment was negative and significant.

The correlation of strategic strategy with personalisation, involvement, student cohesiveness,

satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = -.06$, $p > .05$), ($r = .08$, $> .05$), ($r = .09$, $p > .05$), ($r = .08$, $p > .05$), ($r = .03$, $p > .05$), ($r = -.02$, $p > .05$), ($r = .16$, $p > .05$), ($r = .10$, $p > .05$), and ($r = .22$, $p < .05$) respectively. These implied that the associations of strategic strategy with personalisation and innovation were negative and not significant. The relations of strategic strategy with involvement, student cohesiveness, satisfaction, task orientation, individuation and perceptionsof classroom environment were positive and not significant. The relation between strategic strategy and academic performance was positive and significant.

The correlation of styles and pathology with personalisation, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = .30$, $p < .01$) ($r = .17$, $p > .05$), ($r = .11$, $p > .05$), ($r = .26$, $p < .05$), ($r = .08$, $p > .05$),

($r = .17$, $p > .05$), ($r = .15$, $p > .05$) ($r = .32$, $p < .01$) and ($r = -.11$, $p > .05$) respectively. The association of styles and pathology with personalisation and perceptions of classroom environment were positive and highly significant. The relation between styles and pathology and satisfaction was positive and significant. The relations of styles and pathology with involvement, student cohesiveness, task orientation, innovation, individuation were positive and not significant. The relation between styles and pathology and academic performance was negative but not significant.

4.4.3 Correlations for science students.

The correlations for different variables calculated over the sample of science students are included in Table 23.

TABLE-23 : Intercorrelation Matrix on classroom environment, learning strategies and academic performance for Science Students.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
Personalization													
Involvement	14												
Student cohesiveness	-03	*31											
Satisfaction	14	23	*27										
Task orientation	14	01	03	11									
Innovation	**43	*30	20	12	11								
Individuation	-04	04	14	**49	*28	22							
Perceptions of Classroom Environment	**50	**51	**53	**60	**-45	**65	**53						
Academic performance	*-31	-20	*-26	04	*29	**-45	-02	*-28					
ASI score	-10	-16	01	*29	06	00	16	06	-06				
Deep Strategy	18	**41	24	**40	**44	23	*27	**57	*25	23			
Surface Strategy	*-25	**-37	**-33	-08	-05	*-26	-13	**-39	22	**61	*-29		
Strategic Streagy	-07	-18	08	06	*-27	05	01	-08	15	**57	-22	*29	
Styles and pathology	-05	-15	09	*26	-01	03	21	09	-07	**60	01	11	13

* Significant at the .05 level
** Significant at the .01 level

Decimal points are not given for the sake of convenience.

The deep strategy correlated with personalisation, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance ($r = .18$, $p > .05$), ($r = .41$, $p < .01$), ($r = .24$, $p > .05$), ($r = .40$, $p < .01$), ($r = .44$, $p < .01$), ($r = .23$, $p > .05$), ($r = .27$, $p < .05$), ($r = .57$, $p < .01$) and ($r = .19$, $p > .05$). The associations of deep strategy with personalisation, student cohesiveness and innovation were positive and not significant. The relation between deep strategy and academic performance was negative and not significant. The relations of deep strategy with involvement, satisfaction, task orientation and perceptions of classroom environment were positive and highly significant. The relation between deep strategy and indivduation was positive and significant.

The correlation of surface strategy with personalisation, involvement, student cohesiveness, satisfaction, task orientation, innovation, indivuation, perceptions of classroom environment and academic performance were ($r = -.25$, $p < .05$), ($r = -.37$, $p > .01$), ($r = -.33$, $p < .01$), ($r = -.08$, $p > .05$) ($r = -.05$, $p > .05$) ($r = -.26$, $p < .05$), ($r = -.13$, $p > .05$), ($r = -.39$, $p < .01$) and ($r = .22$, $p > .05$) respectively. The associations of surface strategy with involvement, student cohesiveness

and perceptions of classroom environment were negative and highly significant. The relations of surface strategy with personalisation and innovation were negative and significant. The relations of surface strategy with satisfaction, task orientation and individuation were not significant. The relation between surface strategy and academic performance was positive but not significant.

The associations of strategic strategy with personalization, involvement, perceptions of classroom environment and academic performance were not significant. The relations of strategic strategy with student cohesiveness, satisfaction, innovation and individuation were positive but not significant. The relation between strategic strategy and task orientation was negative and significant.

The correlation of styles and pathology with personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r=-.05$, $p > .05$), ($r= -.15$, $p > .05$), ($r= .09$, $p > .05$), ($r= .26$, $p < .05$), ($r= -.01$, $p > .05$),

($r = .03$, $p > .05$), ($r = .21$, $p > .05$), ($r = .09$, $p > .05$) and ($r = -.07$, $p > .05$) respectively. The associations of styles and pathology with personalization, involvement, task orientation and academic performance was not significant.

The relations of styles and pathology with student cohesiveness, innovation, individuation and perceptions of classroom environment were positive but not significant. The relation between styles and pathology and satisfaction was positive and significant.

4.4.4. Correlations for non-science students

The correlations for different variables calculated over the sample of non-science students are included in Table 24.

TABLE-24 : Intercorrelation Matrix on classroom environment, learning streategies and academic performance for non-science students.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Personalization													
Involvement	**30												
Student cohesiveness	10	**38											
Satisfaction	13	11	**25										
Task orientation	16	-03	07	15									
Innovation	**36	**33	23	**24	18								
Individuation	*21	17	-09	15	07	*25							
Perceptions of Classroom Environment	**58	**57	**56	**54	**44	**68	**43						
Academic performance	-03	02	04	-13	-04	00	-12	-07					
ASI Score	16	-04	07	23	*23	11	02	*22	-16				
Deep Strategy	*21	*23	**29	**56	*23	**27	00	**48	-05	**52			
Surface strategy	07	**-32	-17	01	13	-02	-10	-09	-10	**61	05		
Strategic strategy	03	00	07	-13	-01	04	19	05	-13	**46	-03	01	
Styles & pathology	07	05	01	13	19	-01	-04	11	-09	**69	**25	**25	08

* Significant at the .05 level
** Significant at the .01 level

Decimal points are not given for the sake of convenience.

Table 24 presented the following correlations for the non-science students.

The correlation of deep strategy with personalization, involvement, student cohesiveness, satisfaction, task-orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = .21$, $p < .05$), ($r = .23$, $p < .05$), ($r = .29$, $p < .01$), ($r = .56$, $p < .01$), ($r = .23$, $p < .05$), ($r = .27$, $p < .01$), ($r = .00$, $p > .05$), ($r = .48$, $p < .01$) and ($r = -.05$, $p > .05$). The associations of deep strategy with personalisation, involvement and task orientation were positive and not sitnificant. The relations of deep strategy with student cohesiveness, satisfaction, innovation, and perceptions of classroom environment were positive and highly significant. There was no relation between deep strategy with individuation. The relation between deep strategy and academic performance was negative and not meaningful.

The correlation of surface strategy with personalisation, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = .07$, $p > .05$), ($r = -.32$, $p < .01$), ($r = -.17$, $p > .05$), ($r = .01$, $p > .05$), ($r = .13$, $p > .05$), ($r = -.02$, $p > .05$), ($r = -.10$, $p > .05$), ($r = -.09$, $p > .05$)

and ($r = -.10$, $p > .05$) respectively. The association between surface strategy with involvement was negative and significant. The relations of surface strategy with personalization, satisfaction and task orientation were positive. The relations of surface strategy with student cohesiveness, innovation, individuation, perceptions of classroom environment and academic performance were negative and not significant.

The associations of strategic strategy with personalization, student cohesiveness, innovation and perceptions of classroom environment were positive and not significant. The relations of strategic strategy with satisfaction, task orientation and academic performance were negative and not significant. The relation between surface strategy and individuation was positive and significant.

The associations of styles and pathology with personalization, involvement, student cohesiveness, satisfaction, task orientation and perceptions of classroom environment were positive and not significant. The relations of styles and pathology with innovation, individuation, and academic performance were negative and not significant.

4.4.5 Correlations for Male students.

The correlations for different variables calculated over the sample of male students are included in Table-25.

TABLE-25: Inter Correlation Matrix on classroom environment, learning strategies and Academic Performance for Male students

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Personalization Involvement	*20												
Student Cohesiveness	03	**35											
Satisfaction	01	08	*23										
Task orientation	05	-01	08	*20									
Innovation	*23	*20	16	04	08								
Individuation	12	14	00	15	*23	17							
Perceptions of Classroom Environment	**44	**52	**57	**51	**50	**51	**47						
Academic Performance	-04	11	-11	-03	14	*-22	-01	-05					
ASI Score	-05	*-20	01	*21	15	-01	-02	05	-11				
Deep Strategy	-10	18	*24	**48	**34	03	-02	**35	08	**39			
Surface Strategy	-01	**-31	-20	-01	-02	01	-05	-16	-08	**64	-07		
Strategic Strategy	-03	-17	-01	-15	-09	01	03	-12	17	**46	*-19	*19	
Styles and pathology	04	-08	02	15	13	-05	01	07	-04	**62	16	*21	01

* Significant at the .05 level
** Significant at the .01 level

Decimal points are not given for the sake of convenience.

The correlations of deep strategy with personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = -.10$, $p > .05$), ($r = .18$, $p > .05$), ($r = .24$, $p < .05$), ($r = .48$, $p < .01$), ($r = .34$, $p < .01$), ($r = .03$, $p > .05$), ($r = -.02$ $p, > .06$), ($r = .35$, $p < .01$) and ($r = .08$, $p > .05$). These implied that the associations of deep strategy with personalization, and individuation were negative. The relations of deep strategy with involvement, innovation, and academic performance were positive and not significant. The relation between deep strategy and student cohesiveness was positive and significant. The relations of deep strategy with satisfaction, task orientation, and perceptions of classroom environment were positive and significant.

The correlation of surface strategy with per personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = -.01$, $p > .05$), ($r = -.31$, $p < .01$), ($r = -.20$, $p < .05$) ($r = 0$, $p > .05$), ($r = -.02$, $p > .05$), ($r = .01$, $p > .05$), ($r = -.05$, $p > .05$, ($r = -.16$, $p > .05$) and ($r = -.08$, $p > .05$) respectively. These implied that the association of

surface strategy with personalization, satisfaction, task orientation, individuation, perceptions of classroom environment and academic performance were negative. The relation between surface strategy and involvement was negative and significant. The relation between surface strategy and student cohesiveness was negative and significant.

The correlation of strategic strategy with personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, perceptions of classroom environment, and academic performance were ($r = -.03$, $p > .05$), ($r = -.17$, $p > .05$), ($r = -.01$, $p > .05$), ($r = -.15$, $p > .05$), ($r = -.09$, $p > .05$), ($r = .01$, $p > .05$), ($r = .03$, $p > .05$), ($r = -.12$, $p > .05$) and ($r = .17$, $p > .05$) respectively. The associations of styles and pathology with personalization, student cohesiveness, satisfaction, innovation and academic performance, task orientation, individuation, and perceptions of classroom environment were not significant.

4.4.6 Correlations for female students.

The correlations for different variables calculated over the sample of female students are included in Table-26.

TABLE-26: Intercorrelation Matrix on classroom environment, learning strategies and academic performance for female students.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
Personalization													
Involvement	07												
Student Cohesiveness	-03	*28											
Satisfaction	10	11	*26										
Task orientation	**33	-11	00	-09									
Innovation	**39	**33	*25	**33	*25								
Individuation	-10	-03	-11	**36	-09	21							
Perceptions of classroom environment	**50	**45	**51	**55	**39	**80	*31						
Academic Performance	**-33	*-27	-12	-18	-09	-08	-17	**-33					
ASI score	17	00	11	*28	23	11	14	*29	-17				
Deep Strategy	**52	**37	22	**44	16	**45	13	**64	**36	**44			
Surface strategy	02	**-37	-19	04	*30	-21	-15	-16	16	**61	-02		
Strategic strategy	-06	04	*27	01	-07	05	*31	16	-13	**55	00	11	
Styles & pathology	01	07	04	22	12	06	09	16	-15	**73	20	21	23

* Significant at the .05 level
** Significant at the .01 level

Decimal points are not given for the sake of convenience.

The correlations of deep strategy with personalization involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = .52$, $p < .01$), ($r = .37$, $p < .01$), ($r = .22$, $p > .05$), ($r = .44$, $p < .01$), ($r = .16$, $p > .05$), ($r = .45$, $p < .01$), ($r = .13$, $p > .05$), ($r = .64$, $p < .01$) and ($r = .36$, $p < .01$), respectively. These implied that the associations of deep strategy with personalization, innolvement, satisfaction, innovation, perceptions of classroom environment and academic performance were positive and significant. The relations of deep strategy with task orientation and individuation were not significant.

The correlations of surface strategy with personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were ($r = .02$, $p > .05$), ($r = .37$, $p < .01$), ($r = -.10$, $p > .05$), ($r = .04$, $p > .05$), ($r = .30$, $p < .05$), ($r = -.21$, $p > .05$), ($r = -.15$, $p > .05$), ($r = -.16$, $p > .05$) and ($r = .16$, $p > .05$) respectively. The associations of surface strategy with personalization, satisfaction and academic performance were not significant. The

relation between surface strategy with task orientation was positive and significant. The relations of surface strategy with student cohesiveness, innovation, individuation and perceptions of classroom environment were not significant.

The associations of strategic strategy with personalization, task orientation, and academic performance for female students were not significant. The relations of strategic strategy with involvement, satisfaction, innovation and perceptions of classroom environment were positive and not significant. The relations of strategic strategy with student cohesiveness and individuation were positive and significant.

The associations of styles and pathology with personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment and academic performance were not significant.

4.4.7 Correlations for teacher styles and different variables of learning strategies for total students.

The correlations for different variables calculated over the total sample are included in Table 27.

TABLE-27: Intercorrelation matrix for different variables of teacher styles and of learning strategies for total students.

Variable	1	2	3	4	5	6	7	8	9	10
Deep Strategy										
Surface Strategy	-07									
Strategic strategy	-01	11								
Styles & pathology	*-17	**21	09							
Perceptions of Classroom environment	**50	*-18	02							
Academic performance	*17	01	*18	-08	*18					
Originality	*18	07	10	06	*17	**25				
Efficiency	-14	07	*17	06	09	**31	**22			
Conformity	-03	01	**28	01	**-36	-12	-02	15		
K.A.I. score	**26	01	**-25	02	*30	**22	23	-02	**-50	

* $p < .05$
** $p < .01$

Decimal points are not given for the sake of convenience.

The correlation between deep strategy with styles and pathology ($r = -.17$, $p < .05$) indicated that students who adopted deep strategy are negatively influenced by styles and pathology. The correlation between deep strategy and perceptions of classroom environment, academic performance, originality of teachers and teacher's KAI score were

($r = .50$, $p < .01$), ($r = .17$, $p < .05$), ($r = .18$, $p < .05$) and ($r = .26$, $p < .01$) respectively. The associations of deep strategy with perceptions of classroom environment and teacher's originality were positive and significant. The relationship of deep strategy with academic performance and teacher's KAI scores were positive and highly significant. It meant that when teachers were innovative and possessed originality students' perceptions of classroom environment were positive. They adopted deep strategy and achieved well in academic performance.

The correlation between surface strategy and perceptions of classroom environment was ($r = -.18$, $p < .05$) negative and significant. The correlations of surface strategy with academic performance, teacher's originality, teacher's efficiency, teacher's conformity and teacher's KAI score were not significant. It indicated that when teachers did not possess originality, conformity or efficiency and did not show either innovativeness or adaptiveness, students' perception of classroom environment was not positive. They adopted surface strategy and did not achieve well in academic performance.

The correlation of strategic strategy with academic performance, teacher's efficiency and teacher's conformity were positive and significant. The relation between strategic strategy with teacher's conformity was positive and highly significant. The correlation of strategic

strategy with perceptions of classroom environment and teacher's originality were not significant. The correlation between strategic strategy and teacher's KAI score was ($r=-.25$, $p < .01$). This implied that there was a negative relation between strategic strategy strategy and teacher's KAI score. The correlation between strategic strategy and styles and pathology was ($r=.21$, $p < .01$) significant.

When teachers did not possess originality or innovativeness but not possessed adaptiveness, conformity and efficincy, students generally adopted strategic strategy and achieved well in academic performance, irrespective of the perceptions of classroom environment. There were no associations between styles and pathology with perceptions of classroom environment, academic performance, teacher's originality, efficiency, conformity, and teachers' KAI score.

4.4.8 Correlations among different items of deep strategy of ASI inventory.

The correlations among different items on deep strategy of ASI inventory for the total sample are included in Table 28.

TABLE-28: Intercorrelation Matrix for factor deep strategy of ASI

Item	1	2	3	4	5	6	7	8	9	10	11
Persistence in efforts											
Understanding	14										
Utilising new information	07	00									
Relating ideas	-10	04	13								
Relating ideas to real life situations	03	11	*18	08							
Fitting ideas together	12	*15	**31	*19	-04						
Divergent ways of looking at facts.	*17	-08	*20	12	**22	03					
Concluding logically using materials	12	**27	11	-06	*15	*18	03				
Connecting facts with the findings	-06	**21	07	08	07	*16	**24	*15			
Interest in subject	08	09	13	14	04	11	14	**24	14		
Exciting course	*18	**22	*17	-05	05	**50	08	**23	04	-02	
Interesting course work	-06	*15	*18	*17	*15	**27	**22	02	02	02	*15

* $p < .05$,
** $p < .01$.

Decimal points are not given for the sake of convenience.

The item measuring persistence in efforts correlated with divergent ways of looking at facts ($r = .17$, $p < .05$) and exciting course ($r = .18$, $p < .05$) meaning that persistence in efforts was necessary for working at various facts and new courses. The correlation of items of comprehension with fitting ideas together, concluding logically using materials, connecting facts with the findings, exicting course and interesting course work were ($r = .15$, $p < .05$), ($r = .27$, $p < .01$), ($r = .21$, $p < .01$), ($r = .22$, $p < .01$) and ($r = .15$, $p < .05$). These implied that good comprehension was required for fittings ideas together, connecting facts and making lessons interesting. The item on utilising new information correlated significantly with items on relating ideas to real life situation, fitting ideas together, divergent ways of looking at facts, exciting course and interesting course work. The item on relating ideas to real life situations correlated with items on divergent ways of looking at facts, concluding logically using materials and interesting course work.

The correlation among items fitting ideas together, concluding logically using materials, connecting facts with the findings, exciting course and interesting course work were significant ($r = .18$, $p < .05$), ($r = .16$, $p < .05$) ($r = .50$, $p < .01$) and ($r = .27$, $p < .01$). The correlation

of item on divergent ways of looking at facts with items on connecting facts with the findings and interesting course work were ($r=.24$, $p < .01$), and ($r= .22$, $p < .01$). The correlations of item on concluding logically using materials with items on connecting facts with the findings and interesting course work were also significant.

Overall, the results indicated that utilising new information would be required for relating ideas to real life situations, fitting ideas together, divergent ways of looking at facts, exciting course, logically concluding using materials and exciting course work. These were interdependent facets of approaches to study and shared common variance.

4.4.9 Correlations among different items on surface strategy of ASI.

The correlations among different items on surface strategy of ASI inventory calculated over the total sample are included in Table 29.

TABLE-29: Intercorrelation Matrix for factor surface strategy of ASI.

Item	13	14	15	16	17	18	19	20	21	22	23	24
Intention to memorise												
Rote memory	*19											
Reading without understanding	-02	*19										
Clarity in direction	10	08	*19									
Preference in organised course	-05	-11	**21	-09								
Syllabus boundedness	-08	07	*15	**29	01							
Tension & depression	-12	-08	12	-13	-09	*16						
Nervousness in poor answer	-01	09	-02	-13	08	*17	01					
Fearness in speaking	*19	*16	09	13	-14	-02	-01	02				
Aspiring for a job	05	04	05	06	02	-08	-03	**21	06			
Career orientation	13	03	*19	**21	02	**34	*18	06	01	**20		
Aspiring certificate	-01	12	05	03	*17	-02	12	**23	07	-03	-01	

* P < .05,
** p < .01.

Decimal points are not given for the sake of convenience.

The intention to memorise correlated with rote memory and tension and depression were ($r=.19$, $p < .05$) and ($r=.19$, $p < .05$). The correlations of rote memory with reading without understanding and fearness in speaking were ($r=.19$, $p < .05$) and ($r= .16$, $p < .05$). The reading without understanding correlated with clarity in direction and career orientation ($r=.19$, $p < .05$) and ($r=.19$, $p < .05$). The clarity in direction correlated significantly with syllabus boundedness and career orientation ($r=.29$, $p < .01$) and ($r=.21$, $p < .01$). The preference in organised course correlated with aspiring certificate only ($r=.19$, $p < .05$). The syllabus boundedness correlated with tension and depression and career orientation ($r= -.16$, $p < .05$) and ($r=-.34$, $p < .01$). The feeling of tension and depression correlated with career orientation ($r=-.18$, $p < .05$). The nervousness in poor answer correlated with aspiring for a job and certificate only.

The results indicated that the intention to memorise, rote memory, tension and depression, understanding without clarity and career orientation were interdependent. A positive change in one could lead to a positive change in others. Also clarity directly correlated negatively with syllabus boundedness indicating that those who looked for clarity were unable to function within the limits of syllabus and if they did so it caused tension.

4.4.10 Correlations among different items on strategic strategy of ASI.

The correlations among different items on strategic strategy of ASI inventory calculated over the total sample are included in Table 30.

TABLE-30 : Intercorrelator Matrix for factor strategic strategy of ASI.

Item	25	26	27	28	29	30	31	32	33	34	35	36
Teacher orientation												
Changing conditions	-09											
collecting books	01	20										
Difficulty in using study time	-03	01	07									
Putting off studies	03	*-18	00	06								
Slowness at study	-10	-02	06	06	*19							
Usefulness of the study	07	-05	12	**41	06	02						
Thinking back	07	*-15	*16	08	04	00	13					
Passing the exam	08	-14	-03	-11	11	08	**-22	18				
enjoying competition	*16	11	**22	12	*-15	-01	10	-03	01			
achieving well	*19	05	**30	-04	-13	-14	-09	05	-11	**25		
Doing better	12	*20	**44	10	-11	-03	-07	-03	-06	**38	**32	

* $p < .05$,
** $p < .01$.

Decimal points are not given for the sake of convenience.

The teacher orientation correlated with enjoying competition and achieving well ($r=.16$, $p < .05$) and ($r=.19$, $p < .05$). The item on changing conditions correlated with items on putting of studies and thinking back. The item on collecting books correlated with items on enjoying competition, achieving well and doing better ($r=.22$, $p < .01$), ($r=.30$, $p < .01$) and ($r=.44$, $p < .01$). The item on difficulty in using study time correlated with usefulness of the study ($r=.41$, $p < .01$). The putting of studies correlated with slowness at study and enjoying competition. The correlations of passing the examination with thinking usefulness of the study and thinking back were ($r=.22$, $p < .01$) and ($r=.18$, $p < .05$). The feeling of enjoying competition correlated with achieving well and doing better ($r=.25$, $p < .01$) and ($r=.38$, $p < .01$). The item on achieving well correlated with doing better ($r=.32$, $p < .01$). Apparently the teacher orientation, enjoying compeition, achieving well, changing conditions, doing better, collection of books and usefulness of study were interdependent aspects of study.

It was interesting that passing the examination, thinking usefulness of study, changing conditions and putting off studies were negatively correlated, indicating that those who looked for passing at the examination only were unable to understand the usefulness of the study and they tend to put off studies.

4.4.11 Correlations among different items on the styles and patholy of ASI

The correlations among different items on styles and pathological factors of ASI inventory calculated over the total sample are included in Table 31.

TABLE-31: Intercorrelation Matrix for factor styles and pathology of ASI

Item	37	38	39	40	41	42	43	44	45	46	47
Unrelated thinking											
Imaginative thinking	04										
Playing with own ideas	-03	**26									
Explaining in own way	-15	03	00								
Unrelated writing	-09	-11	-04	-03							
Jumping conclusion	06	-07	-09	-16	05						
Focus on parts	-11	03	-01	04	-02	**27					
Preference in try out	**23	-05	08	-05	20	-07	08				
Starting straight	08	**26	*20	07	**20	-13	03	*18			
Difficulty in fitting ideas	11	13	13	-09	**25	**22	-14	*15	-11		
Using ideas differently	-04	06	-07	**23	06	-12	03	*19	10	01	
Following teacher's order	-11	-08	-02	*16	-10	-08	06	04	02	-06	01

* $p < .05$,
** $p < .01$.

Decimal points are not given for the sake of convenience

The items on unrelated writing, explaining in own way and preference in try out were found correlated ($r=-.15$, $p < .05$) and ($r=-.23$, $p < .01$). The correlations of imaginative thinking with playing with own ideas and starting straight were ($r=.26$, $p < .01$) and ($r=.26$, $p < .01$). The playing with own ideas correlated with starting straight ($r=.20$, $p < .05$). The explaining in own way correlated with using ideas differently and following teacher's order. The unrelated writing correlated with preference in try out and difficulty in fitting ideas. The unrelated writing correlated negatively with starting straight ($r=-.20$, $p < .05$). The jumping conclusion was correlated to focus on parts and difficulty in fitting ideas. The preference in try out correlated with using ideas differently ($r=.19$, $p < .05$).

The results indicated that imaginative thinking, playing with own ideas, starting straight and using ideas differently were interdependent to a good ext ent and share common variance. A change in one led to a change in others. Also preference in try out, unrelated writing, explaining in own way, jumping conclusion, focus on parts and difficulty in fitting ideas were found negatively correlated indicating that those abilities were not suitable for students to adopt a workable learning strategy. The full table of correlations among ASI items is included in Appendix- 4.

4.5 CORRELATIONAL ANALYSIS FOR TEACHERS.

In order to investigate the relationships among different variables. Pearson correlation co-efficients (r) were calculated among three variables for teachers, namely teaching experience, teacher styles and SES. The correlations were computed separately for school, college, science, non-science, male and female teachers separately. The correlation matrices for various groups of teachers are presented in Tables 32-37.

4.5.1 Correlation for college teachers.

The correlations among different variable calculated over the sample of college teachers are included in Table-32.

TABLE-32: Intercorrelation Matrix on Teaching experience, teacher styles and SES for college teachers.

Variable	1	2	3
Teaching experience			
Teacher styles	.17		
SES	-.01	-.30	

The teaching experience correlated with teacher styles and SES ($r=.17$, $p > .05$) and ($r=-.01$, $p > .05$) respectively. The correlation between teacher styles and SES were ($r=-.30$, $p > .05$). These implied that there was positive

but non significant association between teaching experience and teacher styles and between teacher styles and teacher's SES.

4.5.2 Correlations for school teachers

The correlations among different variables calculated over the sample of school teachers are included in Table-33.

TABLE-33: Intercorrelation Matrix on Teaching experience, teacher's styles and SES for School Teachers.

Variable	1	2	3
Teaching experience			
Teachers styles	.39		
SES	-.34	-.42	

The correlation for teaching experience with teacher styles and teacher's SES ($r=.39$, $p > .05$) and ($r=-.34$, $p > .05$) respectively. The correlation between teacher styles and teacher's SES were ($r= -.42$, $p > .05$). There was positive but no significant association between teaching experience and teacher styles. There was also negative but non significant relation between teacher styles and teacher's SES, and teaching experience and teacher's SES.

4.5.3 Correlations for science teachers.

The correlations among different variables calculated over the sample of science teachers are included in Table 34.

TABLE-34: Intercorrelation Matrix on Teaching experience, teacher styles and SES for science teachers.

Variable	1	2	3
Teaching experience			
Teacher' styles	.35		
SES	-.26	-.21	

The correlation for teaching experience of science teachers with teacher styles and SES were ($r=.35$, $p > .05$) and ($r=-.26$, $p > .05$) respectively. For teacher styles and teachers SES it was ($r=.21$, $p > .05$). These implied that the association between teaching experience with teacher styles was positive but non significant. The relations of teacher's SES with teaching experience and teacher styles were negative but not meaningful, implying that teachers with higher experience and more innovative styles did not come necessarily from high SES background.

4.5.4. Correlations for non-science teachers.

The correlations among different variables calculated over the sample of non-science teachers are include in Table-35.

TABLE-35: Intercorrelation Matrix on Teaching experience, teacher styles and SES for non-science teachers.

Variable	1	2	3
Teaching experience			
Teacher styles	.18		
SES	-.05	-.43*	

* Significant at the .05 level.

The correlations for non-science teachers' teaching experience with teacher styles and SES were ($r=.18$, $p > .05$) and ($r= -.05$, $p > .05$) respectively. The correlation between teacher styles and teacher SES was ($r= -.43$, $p > .05$). The association of teaching experience with teacher styles was positive but non significant. The relation of teaching experience and teacher's SES was negative but not significant. The relation of teacher styles with teacher' SES was negative and significant.

4.5.5. Correlation for male teachers.

The correlations among different variables calculated over the sample of male teachers are included in Table 36.

TABLE-36: Intercorrelation matrix on teaching experience, teacher styles and SES for male tachers.

Variable	1	2	3
Teaching experience			
Teacher styles	.27		
SES	.14	-.41**	

** Significant at the .01 level

The correlation of teaching experience with teacher styles and teacher's SES for male teachers were ($r=.27$, $p > .05$) and ($r=-.14$, $p > .05$) respectively. The correlation between teacher styles with teacher's SES was ($r= -.41$, $p < .01$). The association between teaching experience and teacher styles was positive but not significant. The relation of teacher styles with teacher's SES was negative and not significant. The relation of teacher styles with teacher's SES was negative and highly significant, indicating that many low SES teachers were found innovative.

4.5.6 Correlation for female teachers.

The correlations among different variables calculated over the sample of female teachers are included in Table-37.

TABLE-37: Intercorrelation Matrix on teaching experience, teacher - styles and SES for female teachers.

Variable	1	2	3
Teaching experience			
Teacher styles	.37		
SES	.03	-.06	

The correlations of teaching experience with teacher styles and teacher's SES were ($r=.37$, $p > .05$) and ($r=.03$, $p > .05$) respectively. The correlation between teacher styles and teacher's SES was ($r=-.06$, $p > .05$). These implied that the association of teaching experience with teacher styles and teacher's SES was positive and not significant. The relation of teacher styles with teacher's SES was negative and not significant.

4.5.7 Correlations among different items on Originality.

The Correlations among different items on the factor of Originality of KAI Inventory calculated over the total sample are included in table 38.

TABLE-38: Intercorrelation Matrix for factor Originality of KAI Inventory.

Item	1	2	3	4	5	6	7	8	9	10	11
Original ideas											
Proliferating ideas	**41										
Stimulating	07	*30									
Coping with several ideas	*27	*27	09								
Always thinking	-02	11	07	18							
Creating than improving	03	-02	08	01	18						
Having fresh perspectives	**35	*28	16	*28	03	-01					
Taking risks	19	**39	**40	*27	-05	*28	11				
Liking to varying	12	**41	*27	-02	09	04	22	*32			
Prefering to work on one	-01	-10	25	-10	01	-01	**40	-09	20		
Standing out in disagreement	13	-04	06	15	*27	*30	-20	04	-13	-20	
Reading stimulation	16	05	-03	07	15	02	18	04	13	-10	09

* $p < .05$
** $p < .01$

Decimal points are not given for the sake of convenience.

The item on having original ideas correlated with proliferating ideas, coping with new ideas and having fresh perspectives ($r=.41$, $p < .01$), ($r=.27$, $p < .05$), and ($r=.35$, $p < .01$). The item on proliferating ideas correlated with stimulating, coping with new ideas, having fresh perspectives, taking risks, and liking to

vary (r=.30, p < .05), (r=.27, p < .05), (r=.28, p < .01), (r=.39, p < .01) and (r=.41, p < .01). The item on coping with new ideas correlated with having fresh perspectives and taking risks (r=.28, p < .05) and (r=.27, p < .05). The item on taking risks correlated with liking to vary (r=-.32, p < .05).

The results indicated that original ideas included proliferating ideas, coping with new ideas, having fresh perspectives, stimulating, taking risks, liking to vary and creating than improving. All these were interdependent and shared common variance.

4.5.8 Correlations among different items on Efficiency.

The correlations among different items of Efficiency of KAI inventory calculated over the total sample are included in Table-39.

TABLE-39 : Intercorrelation Matrix for factor Efficiency of KAI inventory.

Item	13	14	15	16	17	18	19	20
Preferring gradual changes								
Throughness	.42**							
Mastering all details	18	.44**						
Methodical and systematic	.29*	.51**	.39**					
Enjoying details	23	.43**	26	.56**				
Not a steady plodder	-.30*	-11	-06	-03	04			
Consistency	-04	-07	.38**	-06	-12	03		
Imposing strict order	23	.36**	12	09	06	-16	08	

* $p < .05$
** $p < .01$

Decimal points are not given for the sake of convenience.

The item on prefering gradual changes correlated with throughness, methodical & systematic and not a steady plodder ($r=.42$, $p < .01$), ($r=.29$, $p < .05$) and ($r=-.30$, $p < .05$). The item on throughness correlated with mastering details, methodical and systematic, enjoying details and imposing control ($r= .44$, $p < .01$), ($r=.51$, $p < .01$), ($r= .43$, $p < .01$) and ($r=.36$, $p < .01$). The item on methodical and systematic correlated significantly with enjoying details.

The above results exhibited that those who preferred gradual changes with thoroughness were methodical and systematic, master details, enjoyed details, imposed control and were consistent. They were not steady plodders.

4.5.9 Correlations among different items on conformity.

The correlations among different items on conformity of KAI Inventory calculated over the total sample are included in Table 40.

TABLE-40 : Intercorrelation Matrix for factor Conformity of KAI Inventory.

Item:	21	22	23	24	25	26	27	28	29	30	31	32
Fits readily												
Conforming	**35											
Agreeing readily	*31	03										
Never seeking to bend	**38	**40	23									
Never acting without proper authority	*33	*30	04	*33								
Prudent	*33	**37	06	17	**36							
Liking instruction	12	10	*29	20	01	11						
Predictable	-03	17	-06	00	25	06	**44					
Preferring colleagues	14	40	04	22	09	02	21	26				
Liking bosses	08	**43	-05	02	**33	14	12	**57	**46			
Working without deviation	20	**50	19	*31	*30	**45	*29	**36	20	*33		
Holding back ideas	25	14	11	*27	17	13	17	00	15	21	16	

* $p < .05$,
** $p < .01$.

Decimal points are not given for the sake of convenience.

The item on fitting readily correlated with conforming, readily agreeing, never seeking to bend, never acting without authority and prudent ($r = .35$, $p < .01$), ($r = .31$, $p < .05$) ($r = .38$, $p < .01$), ($r = .33$, $p < .05$) and ($r = .33$, $p < .05$). The

item on conforming correlated with never seeking to bend, never acting without authority, prudent, liking consistency and working without deviation ($r=.40$, $p < .01$) ($r=.30$, $p < .05$) ($r=.37$, $p < .01$), ($r= .43$, $p < .01$) and ($r= .50$, $p < .01$). The significant correlations were observed among readily agreeing, liking precise instructions, never seeking to bend, never acting without proper authority, working without deviation and holding back ideas. The item on never acting without proper authority correlated with prudent, working without deviation and liking consistency ($r=.36$, $p < .01$), ($r=.30$, $p < .05$) and ($r=.33$, $p < .05$). The correlation between prefering stable colleagues and liking consistency was ($r=.46$, $p < .01$). The correlation between liking consistency and working without deviation was ($r=.33$, $p < .05$).

The significant correlations implied that fitting readily, conforming, readily agreeing, never seeking to bend, never acting without authority, prudent, liking consistency, working without deviation, holding back ideas were indicative of the nature of conformity itself. The full table of correlations among KAI items is included in Appendix-5.

4.6 FACTOR ANALYSIS OF ASI.

When the items of ASI were factorised to identify the underlying factor structure, twelve factors emerged explaining seventy one percent of total variance. The unrotated matrix alongwith the eigen value and the cumulative percentage of the variance explained by each factor is shown in Table-41.

TABLE 41:- Principal component factor Matrix of A.S.I.

Factor / Item	1	2	3	4	5	6	7	8	9	10	11	12
1.									-32			47
2.							-40		-36			
3.	55											
4.			53									
5.					47				31			
6.	60								-30			
7.	36											
8.	40					33		48				
9.	30	45										
10.						-32		56				
11.	54		-30			-32			-30			
12.												-30
13.				-39							38	
14.				-30					-48			
15.		32			-42							
16.		50								33		
17.	60		-33									
18.		-64		-31								
19.		-36		32								
20.					-30	-37	-34					
21.	-47		-32									
22.						-42						
23.		58										
24.					36					31		

Table contd. on next page

Factor / Item:	1	2	3	4	5	6	7	8	9	10	11	12
25.			-39	-46								
26.	33			30								60
27.	53				-33				35			
28.		-53										
29.	-39	-53	-45									
30.	-34											
31.		-73										
32.				-43			49					
33.		37		-57								
34.	40				-31	30						
35.	50						32					
36.	55											
37.		-33										
38.		-32				-34						
39.		-37										
40.	32							-39				
41.			46							35		
42.	-40			-36								
43.						-34	42	31				
44.			68									
45.		-39	-44			-31						
46.				-39			-42			33		
47.					-45							
48.	36	30										

Contd.

Factor/ Items	1	2	3	4	5	6	7	8	9	10	11	12
Eigen Values	4.99	3.27	2.67	2.32	2.19	1.82	1.76	1.64	1.60	1.52	1.39	1.29
% of variance	25	11	7	5	5	5	4	2	2	2	2	11
Cumulative % of variance	25	36	43	48	53	58	62	64	66	68	70	71

(Decimal points have been ommitted for the sake of convenience.)

Rotated Factor Matrix was obtained by using Kaisers (1958) varimax solution. Items having factor loading of .30 and above had been considered meaningful. The rotated factor matrix is shown in Table-42.

TABLE 42:-Varimax Rotated Factor Matrix for A.S.I.

Factors Items	1	2	3	4	5	6	7	8	9	10	11	12
1.							-81					
2.												-84
3.											60	
4.			72									
5.	53					63						
6.	53											
7.											75	
8.	37							32				-37
9.		36									59	
10.								73				

Table contd. on next page.

Factor / Item	1	2	3	4	5	6	7	8	9	10	11	12
11.	67											-34
12.												-76
13.											-65	
14.						-31	-30		-31			
15.					-55							
16.		42										
17.	35											-57
18.		-65										
19.		-30			-51							
20.						-49		35				
21.			-43	-46								
22.						-67						
23.		61										
24.									-72			
25.	34				63							
26.											79	
27.	39								67			
28.		-64		33								
29.			-44									
30.									56			
31.		-79										
32.							32					
33.												-56
34.	69											
35.	57							41				
36.	63								42			
37.											65	
38.												74
39.										61		
40.				34				-52				
41.					-57							37
42.			-73									
43.				61				30				
44.		73										
45.		-37			32					38		
46.		32		-42						39		
47.										62		

The first factor in the unrotated matrix explained twenty five percent of thtal variance with an eigen value of 4.99. Fourteen positively loaded items in the unrotated matrix were utilising new information, fitting ideas together, divergent ways of looking at facts, concluding logically, comparison with the findings, exciting to read, organised course, desire to get books, enjoying competition, achieving well, explaining in own way and following teacher order respectively. The negatively loaded items were fearness in speaking, putting of ideas, slowness at studies, and jumping conclusion respectively. In the rotated matrix ten items had significant factor loadings on this factor; These items were relating to real life situations, fitting ideas together drawing conclusion logically, exciting to read, syllabus boundedness, teacher's want, getting books, enjoying competition, achieving well and doing better. The nature and content of items indicated that this may be identified as achievement orientation or deep strategy.

The second factor in the unrotated matrix explained eleven percent of the total variance with an eigen value of 3.27. Six positively loaded items in the unrotated matrix were comparison with the findings, reading without understanding, clarity in direction, career planning, passing the examination and following teachers order. Seven negatively loaded items in the unrotated matrix were

syllabus boundedness, continuous tension, difficulty in using study time, usefulness in studying, free imagination, playing with own ideas and going straight with details. On rotation three positive and three negative items emerged having significant factor loadings. Three positive loaded items in the rotated matrix were comparison with findings, clarity in directions and career planning. Three negatively loaded items were syllabus boundedness, continuous tension and difficulty in using study time respectively. This factor may be termed as pragmatic orientation or strategic strategy.

The third factor in the unrotated matrix explained seven percent of the total variance with an eigen value of 2.67. When these were rotated three items had positive and three items had negative factor loadings. Three positively loaded items were relating to ideas, first trying out, and difficulty in fitting ideas respectively. Three negatively loaded items were fearness in speaking, putting off ideas and going straight with details respectively.

The fourth factor in the unrotated matrix explained approximately five percent of the total variance with an eigen value of 2.32. Positively loaded items in the unrotated matrix were continuous tension and changing condition.

The negatively loaded items were intention to memorise, reading without meaning, syllabus boundedness, teacher's want, thinking back, passing the examination, jumping conclusion, and difficulty in fitting ideas. After rotation two positive and three negative items emerged relevant.

Positively loaded items were explanining in own way and prefering to work in parts and negative items were fearness in speaking, jumping conclusions and difficulty in fitting ideas. Many of the items were common between factors 3 and 4. These were thus clubbed together. The nature and content of items in the third and fourth factor indicated that this may be identified as a style and pathological factor.

The fifth factor in the unrotated matrix explained five percent of the total variance with an eigen value of 2.19. Two positively loaded items in the unrotated matrix were continuous tension and changing conditions. The negatively loaded items were intention to memorise, reading without meaning, syllabus boundedness, teacher's want, thinking back, passing the examination, jumping conclusion and difficulty in fitting ideas respectively.

After rotation the positively loaded items were explaining in own way and prefering to work by parts. The negatives loaded items were fearness in speaking, jumping conclusions and difficulty in fitting ideas respectively.

The sixth factor in the unrotated matrix explained five percent of the total variance with an eigen value of 1.82. Two positively loaded items in the unrotated matrix were concluding logically using matrials and enjoying competition and the negatively loaded items were interest in the subject, exciting to read, nervousness in first answer, aspiring job, free imagination, prefering work by parts and starting straight respectively.

After rotation the positively loaded item was relating to real life situation and negatively loaded items were reading without meaning, nervousness in first answering and aspiring job respectively.

The seventh factor in the unrotated matrix explained four percent of the total variance with an eigen value of 1.76. Three positively loaded items in the unrotated matrix were thinking back, achieving well and prefering to work by parts. The negatively loaded items were understanding the meaning, nervousness in first answer, thinking back and difficulty in fitting ideas. After rotation the positively loaded item was thinking back and the negatively loaded items were persistence in efforts and reading without meaning. The nature and content of the fifth, sixth and seven factor indicated that three factors taken together may be named as 'reproducing orientation' or 'surface strategy'.

The eight factor in the unrotated matrix explained two percent of the total variance with an eigen value of 1.64. On rotation five items had positive and one item had negative factor loadings.

The positively loaded items were concluding logically using materials, interest in the subject, nervousness in first answer, achieving well and preference to work by parts respectively. The negatively loaded item was explaining in own way. It was felt from the nature and content of the eighth factor that this may be identified as organisational approach or 'strategic strategy'.

The ninth factor in the unrotated matrix explained two percent of the total variance with an eigen value of 1.60. The positively loaded items in the unrotated matrix were relating to real life situations and desire to get books. The negatively loaded items were persistence in efforts, understanding the meaning, fitting ideas together, exciting to read and reading without meaning respectively. After rotation three positively loaded items were desire to get books, slow at reading, doing better and two negatively loaded items were reading without meaning and aspiring for degree. This may be identified as examination oriented approach or surface strategy.

The tenth factor in the unrotated matrix explained two percent of the total variance with an eigenvalue of 1.52. Five positively loaded items in the unrotated matrix were clarity in direction, continuous tension, aspiring degree, writing unrelated and difficulty in fitting ideas respectively. After rotation four positively loaded items were playing with own ideas, starting straight and difficulty in fitting ideas and using ideas differently. On the basis of the nature and content of items this factor may be named as a 'pathological factor.'

The eleventh factor explained only two percent of the total variance with eigenvalue of 1.39. Two positively loaded items in the unrotated matrix were - intention to memorise, and changing conditions. After rotation there were five positively loaded items utilising new information, divergent ways of looking at facts, comparison with the findings, changing conditions and comprehending ideas and one negatively loaded item namely, intention to memorise.

The twelvth factor explained one percent of the total variance with an eigen value of 1.29. Two positively loaded items in the unrotated matrix were persistence in efforts and explaining in own way. Also one negatively loaded item was interesting course work. After rotation the three positively loaded items were free imagination, writing unrelated, and following teacher's order. The negatively

loaded items were understanding with meaning, concluding logically using materials, exciting to read, organised course, and passing the examination. The eleventh and twelvth factor together may be named as 'meaning orientation approach' or 'deep strategy'.

SUMMARY

The 48 ASI items were subjected to principal factor analysis followed by varimax rotation. It yielded twelve factors with eigen values greater than one which accounted cumulatively for seventy one percent of the total variance.

An examination of the factor loaded on various items indicated possibility of clubbing some factors. Factors 3 and 4 were clubbed. Factors 5,6 and 7 were put together. Factors 11 and 12 were put together. This reduced the total number of meaningful factors to eight. Factors 1,11 and 12 were interpreted as deep strategy.factorsas these contained the items that mostly describe deep approach, relating ideas, use of evidence and intrinsic motivation. Factors 5,6,7 and 9 were labelled surface strategy factors as these contained the items that mostly describe surface approach, syllabus boundedness, fear of failure and extrinsic motivation. Factors 2 and 8 were called strategic streategy as these contained the items that mostly described strategic approach, disorganised study methods, negative attitude to studying and achievement motivation.

Factor 3,4 and 10 were called style and pathology related. These could also be called the holistic streategy related (Watkins, 1988) as these contained items that mostly described comprehension learning, globe trotting, operation learning and improvidence.

These results were in accordance with the results obtained by Watkins (1988). Speth and Brown (1988) obtained eight factor solution. Accoring to him Factor I represented meaning orientation. Factor 2 was dominated by disorganised study items. Factor 3 seemed to be surface approach with items pharsed in differend directions. Factor 4 was motivating factor, with extrinsic positive and intrinsic negative. Factor 5 included the negative attitudes and motivation characteristics of Non-Academic Orientation. Factor VI included academic behaviours typical of the strategic orientation; while Factor VII items were more typical of the Reproducing orientation. Factor VIII only had two items, both on Achievement Motivation. But when 16 ASI subscales were subjected to principal axis factor analysis followed by varimax rotation, four factors were obtained by Speth and Brown (1988). This found support in this research.

4.7 FACTOR ANALYSIS OF KAI.

When the items of KAI were factorised to identify the underlying factor structure, six factors emerged which explained sixty four percent of the total variance. The unrotated matrix alongwith eigenvalues and the cumulative percentage of variance explained by each factor is shown in Table-43.

TABLE-43: Principal component factor Matrix for KAI inventory.

Items No.	1	2	3	4	5	6
1.	37			-42		
2.		-67				
3.	34	-40				
4.		-43				
5.				44		
6.			35			45
7.	42	-49	-37			
8.		-42				
9.		-59				34
10.	39		-39		-33	
11.	35				30	
12.					70	
13.	39	46	-40			-39
14.	74		-43			
15.	63					
16.	51		-41	34	-30	
17.	38					
18.			49			
19.						
20.	46	30		-36		
21.	46	42				
22.	60					
23.			32	-41		
24.		55	39			
25.	42	44			47	
26.	64			-34		
27.			51			

Contd.

Item No.	1	2	3	4	5	6
28.	39		37	32		-31
29.			50			
30.	48		36	46		
31.	67					33
32.	32					-31
Eigen values	5.03	3.23	2.73	2.36	1.89	1.32
% of variance	25	10	9	8	1	5
Cumulative % of variance	25	35	44	52	59	64

Decimal points have been omitted for the sake of convenience.

Rotated factor matrix was obtained by using Kaisers (1958) varimax solution. Items having a factor loading of 0.30 and above had been meaningful. The rotated matrix is shown in Table 44.

TABLE-44: Varimax Rotated Factor Matrix for KAI inventory.

Items No.s	1	2	3	4	5	6
1.			55			
2.			54			
3			-52			
4.					-79	
5.					40	49
6.						73
7.		-72			-40	

Contd.

Item	1	2	3	4	5	6
8.	-40					
9.		34				
10.	-80					
11.						65
12.					86	
13.					31	
14.	-51					
15.	-59					
16.	-40					
17.				-77		
18.			64			31
19.			-86			
20.				-70		
21.			32	-55		
22.	67	-32		-35		
23.			69			
24.				50	50	
25.				38	38	
26.				-75		
27.			35			
28.	34					
29.	80					
30.	75				-33	
31.	30	-52		-44		39
32.		31		-45		

Decimal points have been ommitted for the sake of convenience.

The first factor in the unrotated matrix contained nineteen positively loaded items. These explained twenty five percent of total variance with an eigen value of 5.03. Nineteen positively loaded items in the unrotated matrix were having original ideas, stimulating, having fresh perspectives, :refering to work on one, standing out in disagreement, prefering gradual changes, throughness, mastering details, methodical and systematic, enjoying details, imposing control, fitting readily, conforming, never acting without authority, prudent, predictable, liking consistency, working without deviation, and holding back ideas. Five items were positively loaded on rotation. These were conforming, predictable, preferring colleagues, liking consistency and working without deviation. The nature and content of items in the first factor indicated that this may be identified as 'Mertonian Conformist'.

The second factor in the unrotated matrix contained five positively loaded and six negatively loaded items. These explained ten percent of the total variance with an eigenvalue of 3.23. The five positive loaded items were throughness, imposing control, fitting readily, never seeking to bend, never acting without proper authority, and the negative items, were proliferating ideas, stimulating, coping with several new ideas, having fresh perspective, taking risks and liking to vary.

In the rotated matrix eight negatively loaded items were significant. These were having fresh perspectives, taking risks, preferring to work on one, throughness mastering all details, methodical & systematic, conforming and working without deviation. The only positively loaded item was holding back ideas. This factor may be identified as 'Methodical Weberianism'.

The third factor in the unrotated matrix contained eight positively loaded and five negatively loaded items, these explained nine percent of total variance with an eigen value of 2.73. In the unrotated matrix eight positively loaded items were creating than improving, not a steady plodder, readily agreeing, never seeking to bend, liking instruction, predictable, preferring colleagues and liking consistency. The five negatively loaded items were having fresh perspectives, liking to vary, prefering gradual changes, throughness, methodical and systematic.

In the rotated matrix seven positively loaded items were meaningful. These were originality, proliferating ideas, liking to vary, not a steady plodder, fitting readily, readily agreeing, liking instructions. The two ngatively loaded meangingful items were stimulating and consistency. This factor may be identified as 'Originality'.

The fourth factor in the unrotated matrix contained four positively loaded and four negatively loaded items.

These explained eight percent of total variance with an eigen value of 2.36. The four positively loaded items were thinking always, methodical and systematic, predictable and liking consistency. The four negatively loaded items were having originality, imposing control, readily agreeing, and prudent. In the rotated matrix the two positively loaded meaningful items were never seeking to bend and never act without proper authority. The negatively loaded items were enjoying details, imposting strict orders, fits readily, conforming, prudent, working without deviation and holding back ideas. The nature and content of the items in this factor indicated that it contained many of the items as in first factor. It was therefore considered logical to club together the first factor and fourth factor and identify it as 'Mertonian Conformist'.

The fifth factor in the unrotated factor matrix contained three positively loaded items and two negatively loaded items and explained seven percent of total variance. The three positively loaded items were standing out in disagreement, needing the stimulation, never acting without proper authority. The two negatively loaded items were preferring to work on one and methodical and systematic. In the rotated matrix the five positively loaded items were meaningful. These were thinking always,

needing stimulation, preferring gradual changes, never seeking to bend and never acting without proper authority and the three negatively loaded items were liking consistency, coping with new ideas and having fresh perspectives. Many of the items contained in this factor were also in the second factor. So the second and firth factor were clubbed together and identified as 'Methodical Weberianisim."

The sixth factor in the unrotated factor matrix contained two positively loaded items and four negatively loaded items and explained five percent of total variance. The two positively loaded items were creating than improving and working without deviation. The four negatively loaded items were liking to vary, prefering gradual changes, predictable and holding back ideas. In the rotated matrix, five positively loaded meaningful items were always thinking, creating than improving, standing out in disagreement, not a steady plodder and working without deviation. Many of the items of this factor were also in the third factor. So the third factor and sixth factor were taken together and labelled 'Originality'.

SUMMARY

A principal factor analysis carried out on 32 items

in the KAI, yeilded six factors with eigenvalues greater than 1 (one) which together accounted for sixty four per cent of the total variance. Varimax rotation was done to indicate how the items might be grouped to produce three sub-scales measuring trait components of the adapter-innovator dimension.

An examination of the factor loadings (Table 44) showed three basic factor types. The first factor combing factor 3 & 6 was called Originality, as it contained items that describe the creative person in much of the literature, especially Rogers' (1959) creative loner. The second factor combined factor 2,& 5 and was called Methodical Weberianism, as it described at one extreme the kind of person Weber (1948) envisaged as needed in organisations - precise, reliable and disciplined. The third factor combining factors 1 and 4 was called'Mertonian Conformist', since it mirrored Merton's (1957) description of the person who fitted well into a bureaucracy because he had proper respect of authority and rules.

CHAPTER - V

DISCUSSION

The present study had its objectives the finding out of the relationships of learning strategy adopted by the students, perceptions of classroom environment and teacher styles. This chapter includes discussion of results in terms of hypotheses tested.

Hypothesis 1 : There will be no significant differences between school and college students on perceptions of classroom environment, academic performance, and learning strategies.

Results indicated that school and college students did not differ significantly on personalization, involvement, student cohesiveness, innovation, individuation, surface strategy and styles and pathology. However, the mean differences between school and college students were significant on satisfaction, task orientation, perceptions of classroom environment and strategic strategy. The mean differences between school and college students were also significant on academic performance and deep strategy. It was felt that the cognitive ability of students, achievement motivation and interactions with the environment were responsible for such differences.

At the same time the homogeneous composition of the two samples in which students had same age, same background and more

or less same standard of teaching may have contributed to the present findings of no differences in the adoption of learning strategies.

It was noted that school students perceived classroom environment more positive than college students and also obtained better score on deep strategy. Obviously the school students performed better than college students. However, college students obtained better score on strategic strategy.

The perceptions of classroom environment were related to good academic performance. This was in accordance with the findings of Sharma (1969), Walberg and Anderson (1973), and Hattie and Watkins (1988). The finding that deep strategy was related to better academic performance was fully supported by Pask (1977), Entwistle (1983) and Ramsden (1983).

Hypothesis 2 : There will be no significant differences between science and non-science students on perceptions of classroom environment, academic performance, and learning strategies.

The mean scores between science and non-science students did not differ significantly on personalization, task orientation, innovation, individuation, perceptions of classroom environment, deep strategy, surface strategy and styles and pathology. However, the means between science and non-science students differed significantly on strategic strategy and academic performance.

The finding of non significant differences on perceptions of classroom environment in two different streams was in direct contradiction to the findings of Walberg et. al. (1969). They found significant relationship between the perceptions of classroom environment and courses. Gakher (1986) administered a battery of tests to 150 science and non-science students on achievement tests. He found that science students scored higher than the non-science students on achievement tests. The finding of significant differences on academic performance was thus in accordance with the finding of Gakher (1986).

The differences between science and non-science students were conceived to be the results of interactions among number of factors, namely the external learning conditions, personality characteristics of individual learner, institutionalized norms, values and cultures. Moreover, the use of immediate feed back in science courses, better future prospects, uniformity of syllabus, social background and achievement motivation were likely to be responsible for such differences. The teaching of different academic subjects was directed to achieve specific educational goals. These specific goals varied from one subject to other. Teaching methods were known to be efficient if the specific goals were achieved and the desired changes were produced in learner's behaviour. According to Past (1977) learning tasks in science were typically described as hierarchical, logical, heterogeneous and rule - and procedure - governed. Arts and social science tasks, on the other hand, were seen to be interpretive, comparative,

generalized, more self governed, and not as difficult or time consuming. That is why science students preferred strategic strategy and achieved better academic performance. This was in accordance with the findings of Entwhistle (1983) that strategic students earned good grades and that science students adopted strategic strategy (Ramsden, 1983).

Hypothesis 3 : There will be no significant differences between male and female students on perceptions of classroom environment, academic performance and learning strategies.

The mean differences between males and females were not significant on student cohesiveness, task orientation, surface strategy, strategic strategy and styles and pathology. However, the mean differences between males and females were significant on academic performance, personalization, involvement, satisfaction, innovation, individuation, perceptions of classroom environment and deep strategy.

The differential perceptions of classroom environment and academic performance by boys and girls were conceived to be the result of interaction among a number of factors, namely, the learning conditions, the personality characteristics of individual learner, and the institution's cultures. The difference in exposure to environment, differential reinforcement and encouragements given by parents, satisfaction and involvement may be responsible for promoting these differences. Many of

the above factors in fact cumulatively affect the perceptions of classroom environment, deep strategy and academic performance of boys and girls. Female students perceived classroom environment more positive and achieved better in academic performance. This observation was supported by several studies (Sharma, 1980; Haerk et.al. 1981; and Trickett et. al. 1982).

Hypothesis 4 : There will be no significant interaction effects of institution types, stream and sex on different variables of perceptions of classroom environment, learning strategies and academic performance.

Results indicated that the interaction effects of institution types, stream and sex on variableslike personalization, involvement, student cohesiveness, satisfaction, task orientation, individuation, perceptions of classroom environment, academic performance, deep strategy, surface strategy and strategic strategy were not significant. It was concluded that jointly the institution type, stream and sex would not influence the above variables.

The only significant interaction effect of institution type, steam and sex was on 'innovation', indicating that any two of the three variables could be used to facilitate innovative experiments.

Hypothesis 5 : The intercorrelations among variables of perceptions of classroom environment, academic performance and learning strategies will not be significantly different for school and college students.

It was observed that for school students deep strategy was not significantly correlated with personalization, involvement, student cohesiveness, innovation, individuation and styles and pathology. However, deep strategy was positively correlated with satisfaction, task orientation and perceptions of classroom environment. Deep strategy was not correlated with academic performance.

It was observed that for college students deep strategy was not significantly correlated with personalization, task orientation, individuation, academic performance and styles and pathology. It may be argued that the students who were just entering into a new academic career in a new institution (college) were not well acquained with the new environment and had less opportunity to express themselves. They were not aware of equity distribution and did not have capacity to judge differences between inputs and outputs. They lacked adequate achievement motivation and did not have capacity to differentiate between inputs and outputs. As a result though they adopted deep strategy they did not achieve high in examinations.

For college students deep strategy was positively correlated with student cohesiveness, involvement, innovation

and perceptions of classroom environment. At college, a new horizon was unveiled before their eyes. They had lesser pressure and rigidity and they experienced satisfaction, innovation and cohesiveness. These helped them to adopt deep strategy.

For school students surface strategy was also significantly cprrelated with personalization, satisfaction, task orientation, innovation, perceptions of classroom environment and styles and pathology. Also, for college students, the surface strategy had no significant correlation with personalization, student cohesiveness, satisfaction, innovation, task orientation and academic performance. The surface strategy was negatively correlated with involvement and perceptions of classroom environment.

Apparently, college students who did not participate actively and attentively in the classroom environment as good, adopted surface strategy. Surface strategy was not significantly correlated with styles and pathology.

In case of school students strategic strategy was not found significantly correlated with involvement, satisfaction, student cohesiveness, task orientation, innovation, individuation, perceptions of classroom environment, styles and pathology and academic performance. Strategic strategy was significantly correlated with personalization. It appeared that in schools, there were opportunities for students to interact with the teacher and teachers had concern for students' welfare. These

environmental factors, achievement motivation and tenacity encouraged students to adopt strategic strategy. Those adopting strategic strategy did not achieve well in academic performance.

For the college students strategic strategy was not significantly correlated with personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, individuation and perceptions of classroom environment. Strategic strategy was positively correlated with academic performance. Perhaps college students who adopted strategic strategy were not so involved in different college activities. They studied mainly by their own initiatives for future career and achieved better in academic performance. It was argued in an earlier study that learning strategies were a product of the interaction between the characteristics of individual students and their perceptions of courses, teaching and assessment procedures (Entwistle, 1987).

Hypothesis 6 : The intercorrelations among variables of perceptions of classroom environment, academic performance and learning strategies will not be significantly different for science and non-science students.

It was observed that for science students deep strategy was not significantly correlated with personalisation, student cohesiveness and innovation. Deep strategy was positively correlated with involvement, satisfaction, task orientation, individuation and perceptions of classroom environment and academic performance.

Those sience students who adopted deep strategy tried their best to understand and gain knowledge and had satisfaction. They were involved in classroom discussions and activities and achieved well in academic performance.

It was observed that for non-science students deep strategy was not significantly correlated with personalization, involvement, task orientation, individuation and academic performance. Deep strategy was positively and significantly correlated with student cohesiveness, satisfaction, innovation and perceptions of classroom environment. Even the non-science students who adopted deep strategy perceived classroom environment positive, undertook innovations and experienced satisfaction.

For science students surface strategy was not significantly correlated with satisfaction, task orientation, individuation and academic performance. The surface strategy was negatively correlated with involvement, student cohesiveness, personalization, innovation and perceptions of classroom environment.

The science students interacted well with the teacher, participated actively and attentively in the class discussions, and activities, tried to understand teachers' techniques, observed demonstration lessons and took part in laboratory experiments, so they perceived classroom environment better and obviously they did not adopt surface strategy.

For non-science students surface strategy was not significantly correlated with personalization, student cohesiveness, innovation, satisfaction, task orientation, perceptions of classroom environment and academic performance. Surface strategy correlated negatively but significantly with involvement. Obviously, those students who were not involved in classroom discussion or activities, adopted surface strategy.

For science students strategic strategy was not found correlated with personalization, involvement, student cohesiveness, satisfaction, innovation, individuation, academic performance and perceptions of classroom environment. It was negatively correlated with task orientation. The students tried to adopt strategic strategy but as the contents were heavy and time was limited they were not able to master the details and do well on academic performance.

For non-science students strategic strategy was not significantly correlated with personalization, student cohesiveness, innovation, satisfaction, task orientation, perceptions of classroom environment and academic performance. It appeared to at those who adopted strategic strategy had feelings of being impersonal, dissatisfaction and mechanistic.

Deep strategy and strategic strategy were relatively more common to science students. This was in accordance with the findings of Pask (1976; 1977) and Rasden (1983). Those

who adopted deep strategy achieved well in academic performance. This was also supported by Entwistle's results (1983). However, the strategic strategy not leading to good academic performance was in contrast to Entwistel's findings (1983).

The non-science students who adopted either deep strategy or strategic strategy were not well acquainted with the course contents, and thus had little influence on academic performance. This finding is in contrast to the findings of Entwistle (1983) that deep students earned good grades. If factual reproduction of memorized answers was implicitly encouraged and actively rewarded students shifted to surface strategies. This was also in accordance with Ramsden (1983) and Fransson (1977). Fransson (1977) reported that students' interest in the subject matter of the task was crucial component in deep approach, especially in arts and social science subjects, while prerequisite knowledge was necessary for science tasks.

Hypothesis 7 : The intercorrelations among variables of perceptions of classroom environment, academic performance and learning strategies will not be significantly different for male and female students.

For male students deep strategy was not significantly correlated with individuation, involvement, innovation and academic performance. However, deep strategy was significantly

correlated with student cohesiveness, task orientation, satisfaction and perceptions of classroom environment. For females students deep strategy was not significantly correlated with orientation and individuation. Deep strategy was significantly and positively correlated with personalization, involvement, satisfaction, innovation, perceptions of classroom environment and academic performance.

The perceptions of classroom environment by boys and girls were conveived to be the interaction among external learning conditions, the personality characteristics of individual learner, and the institutionalized norms etc. and leading to adopt deep strategy.

For male students the surface strategy was not correlated with personalization, satisfaction, task orientation, individuation, perceptions of classroom environment and academic performance. However, surface strategy was found to be negatively and significantly correlated with involvement and student cohesiveness. For female students surface strategy was also not correlated with personalization, satisfaction, student cohesiveness, innovation, individuation, perceptions of classroom environment and academic performance. Surface strategy was significantly correlated with task orientation and negatively correlated with involvement.

Male students who adopted deep strategy were not involved in classroom discussions and activities as they had limited

acquaintance with the course. They tried their best to understand the subject to gain knowledge. Perhaps they thought that they would be able to prepare all materials for examination at the knick of time and thus put off their studies. As the time was limited and their previous experience of preparing at the last moment did not help, they did not achieve well. The female students interacted well with the teacher, participated actively and attentively in the class discussions and activities, understood teachers' novel techniques. They perceived classroom environment as positive and did not accept surface strategy. Obviously, they adopted deep strategy and as in their attempts they were sincere they achieved well in academic performance.

This finding for females was in accordance with the findings of Marton and Saljo (1976) that students who gave a 'deep level' processing account of their approach to a task scored better on tests of understanding than students who described a surface level processing approach. Furthermore, this result for females was also supported by Entwistle (1983) and Weinstein and Underwood (1983). They reported that deep strategy students earned good grades.

For males as well as strategic strategy was not significantly correlated with personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, perceptions of classroom environment and academic performance. In fact variables like personalization, involvement, satisfaction,

innovation, task orientation, individuation and perceptions of classroom environment were interrelated. In case of males, this might be due to their negative attitude to adopt a particular learning strategy leading to dissatisfaction, weaker motivation and not a strong desire to achieve more. For females strategic strategy was positively correlated with student cohesiveness and individuation. This might be due to the involvement of factor of motivation. As said earlier, for females academic performance, deep strategy and perceptions of classroom environment were interrelated. It might be said that perceptions of classroom environment, personalization, involvement, satisfaction, innovation were contributing factors for the adoption of deep strategy leading to good academic performance. This might be due to the result of satisfaction, involvement etc. which promoted strong achievement motivation and encouragement to achieve more. This result was in accordance with the results of Fransson (1977), Ramsden (1983) and Entwistle (1983). Fransson reported that students' perception and relevance undoubtedly increased intrinsic motivation and made a deep strategy more likely to occur. Tasks which were perceived as requiring only reproduction, or on which the students were extrinsically motivated, increased the probability of surface approach.

Hypothesis 8 : The variables of perceptions of classroom environment, academic performance, learning strategies and teacher styles will not have significant correlations.

It was observed that deep strategy was positively and significantly correlated with perceptions of classroom environment, academic performance, teacher's originality and teacher's KAI score. Deep strategy was negatively related with styles and pathology. It was not significantly correlated with teacher's conformity and efficiency.

It appeared that students adopted deep strategy in learning when the teachers possessed originality and innovativeness and these made perceptions of classroom environment better. It led them to achieve well in academic performance. When teachers possessed originality and innovativeness, students perceived classroom environment positive and it led them to achieve well in academic performance. When teachers showed originality and innovativeness in teaching it stimulated students to learn and understand the subject matter in depth. It motivated them and thus led to good academic performance. The finding that academic performance was related to perceptions of classroom environment was in accordance with the results of Sharma (1969), Keeve's (1970), McDil and Regsby (1973), and Walberg and Anderson (1973).

McDil and Rgsby (1973) found that the environment accounted for significant amount of variance in student achievement and

aspirations, if the student background was controlled. The finding that deep strategy led to good grades was supported by the findings of Fransson (1977), Ramsden (1983) and Entwistle (1983), and, Hattie and Watkins (1988). The finding that perceptions of classroom environment influenced deep strategy was supported by Fransson (1977). He reported that student's perception and relevance undoubtedly increased intrinsic motivation and made a deep strategy likely to occur. Hattie and Watkins (1988) reported that deep level learning strategies, which were conducive to high quality learning outcomes, were reported by students who preferred classrooms to be enjoyable and oriented to students being encouraged to do their own study rather than relying on the teacher. A satisfying but more teacher-oriented classroom was preferred by students who were interested in the subject but more likely to use highly organised learning strategies.

The finding that when teachers possessed originality and innovativeness students adopted deep strategy was indirectly supported by the findings of Torrance and Myer (1970) that creative teacher helped students in fluent thinking, flexible thinking, original thinking, elaborate thinking, curiosity, complexity and imagination. This finding was also supported by Biggs (1985) and McCombs (1986) that deep level learning strategies were more likely to be adopted by students who felt responsible for their own learning and who received encouragement from their teachers to do this. Isaksen and Puccio (1988) reported that there was association between Kirton's style measure and widely

used Torrance measure of creativity level which was also reported by Goldsmith and Matherly (1987) and Goldsmith (1987).

The surface strategy was positively and significantly correlated with styles and pathology. Surface strategy was negatively and significantly correlated with perceptions of classroom environment. Surface strategy was not significantly correlated with academic performance, teachers' originality, teachers' conformity, teachers' efficiency and teachers' KAI score.

It might be argued that students adopted surface strategy in learning when teachers were casual and teachers showed neither originality nor conformity, efficiency nor adaptiveness - innovativeness. Students perceived classroom environment negatively and adopted surface strategy. All these factors helped them to develop negative attitudes towards study and did not stimulate or motivate them. Obviously they did not achieve well in academic performance.

The finding that when students did not perceive classroom environment positive. They adopted surface strategy was fully in accordance with the report by Fransson (1977). Fransson reported that it was not so much that anxiety - provoking situations induced surface strategy to learning, but that students who felt the situations to be threatening whether that was intended or not, were more likely to adopt a surface strategy.

Lack of interest or perceived irrelevance also tended to evoke this mechanical rote learning approach. The finding that when students did not perceive classroom environment positive, they did not achieve well in academic performance was fully supported by Hamberhim (1983) and Sharma (1985).

The finding that when teachers did not show originality, conformity, efficiency, adaptiveness or innovativeness indicated that teachers were neither people oriented nor task oriented. This was indirectly in accordance with the finding of effective task oriented teachers to be more effective in a number of studies (Torrance and Parent, 1966; Fortune, 1967; Skinner, 1968; Popham and Baker, 1979).

The strategic strategy was positively and significantly correlated with academic performance, teachers conformity and teacher's efficiency. Strategic strategy was negatively and significantly correlated with teacher's KAI scores. It was not significantly correlated with styles and pathology, perceptions of classroom environment and teacher's originality.

Students adopted strategic strategy in learning when teachers showed conformity, efficiency and adaptiveness but not originality or innovativeness. These did not influence their perceptions of classroom environment. But this perception did not affect their academic performance. Adaptive, conforming

and efficient teachers were found methodical and systematic in teaching and efficiently checking homework. Thisstimulated students to adopt strategic strategy and to go through course work regularly and attentively. The rote learning with understanding was encouraged by teachers in general. Thus, this led them to good academic performance irrespective of their perceptions of classroom environment.

The finding that strategic strategy led to good grades was supported by the studies of Ramsden (1983), Entwistle (1983). The finding that students adopted strategic strategy when teachers were conforming, efficient and adaptive might be said to be in accordance with the findings of Fransson (1977). Fransson's original experiment showed (Fransson, 1977) that the level at which the effects of learning context operated was that of the individual teachers. The attitudes and enthusiasm of a teacher, his concern for helping students to understand, and particularly his ability to understand the difficulties experienced by the students in dealing with a new topic, were all likely to affect his students strategies and attitudes to studying. If conformity, efficiency and adaptiveness were taken as the abilities possessed by nurturant task-style teachers, the present findings were in fact in accordance with the findings of Sinha (1980) in which the effectiveness of nurturant task-styles had been established in the educational context.

CHAPTER - VI

SUMMARY, CONCLUSIONS, IMPLICATIONS AND SUGGESTIONS

6.1 SUMMARY

The present study focussed on the following problem statements:

i) If the perceptions of classroom environment, academic performance and learning strategies varied, across institution types, streams and sex; and,

ii) If the teacher styles, classroom environment, academic performance and the learning strategies adopted by the students were interrelated.

Its main objectives were:-

i) To find out whether school students differed in perceptions of classroom environment, academic performance and learning strategies than college students.

ii) To find out whether students enrolled in different streams (Science and Non-science) differed in perceptions of classroom environment, academic performance and learning strategies.

iii) To find out whether male students differed in perceptions of classroom environment, academic performance and learning strategies than females.

iv) To identify the interrelations among learning strategies adopted by the students, classroom environment, teacher styles and academic performance.

The testable hypotheses laid down for the present study were:-

i) There will be no significant differences between school and college students on perceptions of classroom environment, academic performance and learning strategies.

ii) There will be no significant differences between science and non-science students on perceptions of classroom environment, academic performance, and learning strategies.

iii) There will be no significant differences between male and female students on perceptions of classroom environment, academic performance and learning strategies.

iv) There will be no significant interaction effects of institution types, stream and sex on different variables of perceptions of classroom environment, learning strategies and academic performance.

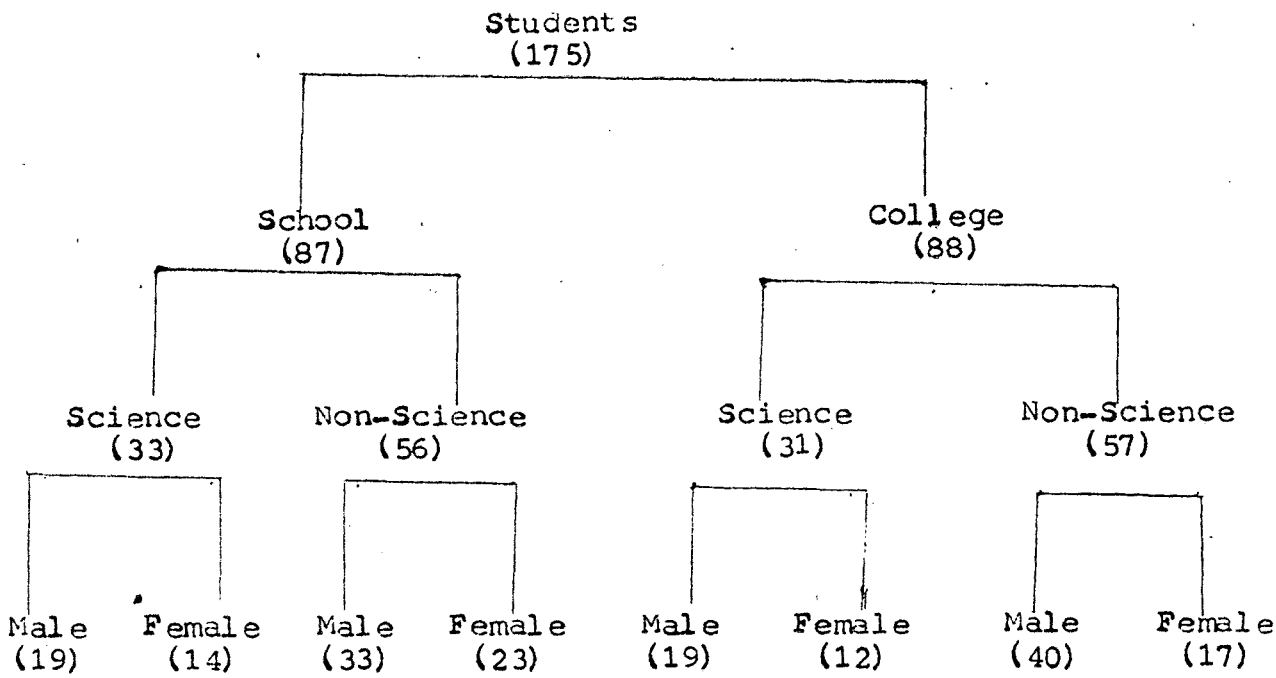
v) The intercorrelations among variables of perceptions of classroom environment, academic performance and learning strategies will not be significantly different for school and college students.

vi) The intercorrelations among variables of perceptions of classroom environment, academic performance and learning strategies will not be significantly different for science and non-science students.

vii) The intercorrelations among variables of perceptions of classroom environment, academic performance will not be significantly different for male and female students.

viii) The variables of perceptions of classroom environment, academic performance, learning strategies and teacher styles will not have significant intercorrelations.

Purposive sampling method was used to select Class XI students from two schools and one college from one rural area in West Bengal. A total of 175 students and 54 teachers were taken for the study. The student sample included is shown below:



Teachers were selected from the same institutions and streams.

Following a factorial design of the order of 2x2x2 having two institution types (school and college), two streams of education (science and non-science) and sex (male and female). Teacher styles, learning strategy adopted by the students, perceptions of classroom environment and academic performance were used as explanatory variables respectively. Matching variables were institution types (school and college), curriculum (science and non-science) and sex (male and female).

Kirton's Adaptor Innovator Inventory (KAI), Ramsden's Approaches to Study Inventory (ASI) modified by the present researcher and Fisher's Perceptions of Classroom Environment

Inventory modified by Das (1987) were used. Reliabilities obtained by Speth and Brown (1988) for the four sub-scales of ASI (Meaning, Achieving, Reproducing and Non-academic) ranged from 0.58 to 0.73, similar to those reported by Ramsden (1983) and, Entwistle and Waterston (1985). The reliability index of the KAI as given by Kirton (1976) was 0.88. Former studies had also yielded strong internal reliability estimates (Mulligan and Martin, 1980; Goldsmith, 1985). Fraser (1986) reported strong reliability estimates for Classroom Environment Inventory.

Data on academic performace of examination were also taken.

The data were collected and codified. The data were analysed by using t-test, analysis of variance, correlation and factor analysis procedures.

The main findings may be summarised as below:-

i) School and college students did not differ on personalization, involvement, student cohesiveness, innovation, individuation, surface strategy and styles and pathology.

ii) School and college students differed significantly on satisfaction, task orientation, perceptions of classroom environment, strategic strategy, deep strategy and academic performance.

iii) Science and non-science students did not differ significantly on personalization, involvement student cohesiveness, satisfaction, task orientation, innovation, individuation, perceptions of classroom environment, deep strategy, surface strategy and styles and pathology.

iv) Science and non-science students differed significantly on strategic strategy and academic performance.

v) Male and female students did not differ significantly on student cohesiveness task orientation, surface strategy, strategic strategy and styles and pathology.

vi) Male and female students differed significantly on personalization, involvement, satisfaction, innovation, individuation, perceptions of classroom environment, deep strategy and academic performance.

vii) Institution types (school and college), streams (science and non-science) and sex had no significant effects on teacher styles.

viii) Socio-economic status of teachers was found related to teacher styles and teaching experience was found not related to teacher styles.

ix) Students adopted deep strategy when teachers were found to possess originality and innovativeness and this made perceptions of classroom environment positive. The deep strategy was positively related to academic performance.

x) Students adopted surface strategy when teachers did not show originality, conformity, efficiency, adaptiveness or innovativeness. Then students did not perceive classroom environment as positive. This strategy had no relation to academic performance.

xi) Students adopted strategic strategy when teachers showed conformity, efficiency and adaptiveness. This was not related to their perceptions of classroom environment, and yet strategic strategy was positively related to academic performance.

xii) The factor analysis of items on Approaches to Study Inventory yielded 12 factors. After clubbing four factors, namely deep strategy, surface strategy, strategic strategy, and styles and pathology were interpreted.

xiii) The factor analysis of items on KAI yielded six factors. After clubbing, three factors, namely Originality, Methodical Weberianism and Mertonian Conformists were interpreted.

6.2 CONCLUSIONS

It was shown that there were institution-related differences on personalization, involvement, student cohesiveness, innovation, individuation, surface strategy and styles and pathology. However, there were significant institution type differences on satisfaction, task orientation, perceptions of classroom environment, strategic strategy, deep strategy and academic performance. These were explained in terms of unequal access to opportunity, learning experiences, and different social expectations.

There were no stream related differences on personalization, involvement, student cohesiveness, satisfaction, task-orientation, innovation, individuation, perceptions of classroom environment, deep strategy, surface strategy and styles and pathology. However, there were differences on strategic strategy and academic performance. They were interpreted in terms of work load content matters, teacher styles, learning methods etc.

No sex differences were noticed on student cohesiveness, task orientation, surface strategy, strategic strategy and styles and pathology. This was perhaps due to equal exposure to educational opportunities and experiences. However, there were significant sex differences on personalization, involvement,

satisfaction, innovation, individuation, deep strategy, perceptions of classroom environment and academic performance.

The factor analysis of 48 ASI items yielded twelve factors with eigen values greater than one and accounted for seventy one per cent of the total variance. After suitable clubbing four factors, namely deep strategy, surface strategy, and styles and pathological factor or holistic strategy were interpreted.

The factor analysis of 32 KAI items yielded six factors with eigen values greater than one which accounted for cumulatively 64 per cent of the total variance. After clubbing three factors, namely Originality, Methodical Weberianism and Mertonian Conformists were interpreted.

It was observed that there were no significant institution types, stream and sex related differences on teacher styles. This may be due to equal exposure, comparable opportunities and experiences of students.

However, teacher styles were found related to their socio-economic status.

Students adopted differential learning strategies when teachers possessed differential teacher styles. This was related to students perceptions of classroom environment and academic performance.

6.3 IMPLICATIONS

The findings of this research showed that perceptions of classroom environment, learning strategies adopted by the students, academic performance and teacher styles were related. These psychological variables also varied between streams and institution types. The positive relationships between teacher styles, learning strategy variables and academic performance could be taken into consideration by educationists and policy makers in trying to make the national educational system more productive and effective.

This research did not provide a blue print for designing modules for effecting learning for the students. It did, however, offer a much needed theoretical and empirical rationale for efforts to improve learning and teaching. It was seen that the process of student learning in relation to indivudual differences and its context was much more complicated than teachers and students were often prepared to accept and cope with.

The findings of the research could be given attention by teachers in attempting to solve the particular difficulties faced by students in their subject area. The adoption of suitable teaching strategies ought take into account the context and individual differences. If institutions should seek to encourage greater versatility among students, then evidence from this research was that on the one hand interventions for students were required, while on the other hand

efforts should be made to reinforce different teacher styles and provide fertile conditions for effective teaching learning interactions. Direct teaching of study strategies, combined with individual remedial help for students experiencing special learning difficulties, could be attempted in educational institutions. Main(1980) and Wankowski (1981) advocated individual counselling of students. Gibbs (1981) suggested specialization in discussion methods, while Brew (1981) concentrated on helping students to organize and structure studying and learning.

It was seen that intrinsic motivation, interest and relevance enhanced the probability of adopting a deep strategy, while threatening assessment conditions made surface approaches more likely occurences. Teachers could encourage instrinsic motivation and point out relevant issues. Although deep strategy may not always be reinforced by effective teaching, the favourable conditions for understanding could be attempted.

The types of learning demanded across different disciplines was clearly different, and so no general recipe for better teacher-learning could be given. In non-science stream students should be encouraged to search for personal meaning which may depend on empathy and openness of staff, informal teaching (discussion) methods, freedom for students to explore their interests, the setting of clear goals and standards. In science, good teaching may depend more on pitching information at the right level and being alert to student difficulties.

The adoption of deep strategy would require operation learning, relating evidence and conclusion, the appropriate use of certain amount of initial rote learning to master the terminology. But this versatility in learning will emerge only if the work load was reasonable, and freedom of learning was allowed. The types of questions will also need to be consistent with teachers' attempts to develop critical thinking. If factual reproduction of memorized answers was implicitly encouraged and actively rewarded (through the marks given), students will shift accordingly towards surface strategies.

Staff development programmes should thus lay stress on teaching techniques, towards helping teachers to understand the effects of their styles on learning strategies. Effective teaching, like effective learning, can be realized in many different ways. Efficient techniques, either of studying or teaching, can only be useful if they can be incorporated within an active and concerned strategy, related to the individual's preference but not dominated by them.

6.4 LIMITATIONS

There were a large number of schools and colleges even in West Bengal where Class XI students were taught. The present study was limited to (due to time constraints) two schools and one college only. This is thus purely exploratory study.

There were three streams like arts, science and commerce. But only science and non-science (Arts) streams were selected as commerce teachers did not co-operate fully.

This study was also limited to only few psychosocial and educational variables. Socio-economic background data on students were not available from records. The scope remains extensive, however. Last, the controls could be improved further.

6.5 SUGGESTIONS

Enumerated below are some of the suggestions for further study -

1. Other schools and colleges could be incorporated in the study to make the sample more representative.
2. Urban and rural sample could be taken to compare learning strategies adopted by the students and the teacher styles.
3. Other factors like socio-economic status of the students, family environment, achievement motivation could also be taken.
4. In order to make the learning effective interventions could be attempted to promote involvement, task orientation through inculcating hard work,

perseverance with individual care and psychological teaching methods, and their impact tested.

5. Learning could be fostered by asking educators to base their teaching on students' perceptions, feelings and actions with emphasis on those activities which the students can test and try out.

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APPENDIX-1.

CLASSROOM ENVIRONMENT INVENTORY

Directions:

The purpose of this questionnaire is to find out your opinion about the class you are attending right now. This form of questionnaire assesses your opinion about what this class is actually like. Indicate your opinion about each questionnaire statement by circling : For example SA, A, D, and SD.

SA	If you strongly agree	That it describes what this class is actually like.
A	If you agree	-do-
D	If you disagree	-do-
SD	If you strongly disagree	-do-

S.No.	ITEMS				
1.	The teacher talks rather than listens.	SA	A	D	SD
2.	All students in the class are expected to do the same works in the same way and in the same time.	SA	A	D	SD
3.	The teacher talks individually with students.	SA	A	D	SD
4.	Each student knows the other members of the class by their first names.	SA	A	D	SD
5.	Students are dissatisfied with what is done in the class.	SA	A	D	SD
6.	New and different ways of teaching are rarely used in this class.	SA	A	D	SD

7.	This is a disorganised class.	SA	A	D	SD
8.	The teacher helps each student who is having trouble with the work.	SA	A	D	SD
9.	Students rarely present their work to the class.	SA	A	D	SD
10.	Friendships are made among students in the class.	SA	A	D	SD
11.	After the class, the students have a sense of satisfaction.	SA	A	D	SD
12.	Class assignments are clear so everyone knows what to do.	SA	A	D	SD
13.	The seating in the class is arranged in the same way each week.	SA	A	D	SD
14.	Students are generally allowed to work at their own space.	SA	A	D	SD
15.	The teacher is not interested in students' problems.	SA	A	D	SD
16.	The instructor dominates class discussion.	SA	A	D	SD
17.	Students in this class get to know each other well.	SA	A	D	SD
18.	Classes are boring.	SA	A	D	SD
19.	Activities in this class are clearly and carefully planned.	SA	A	D	SD
20.	Students seem to do the same type of activities every class.	SA	A	D	SD
21.	It is the teacher who decides what will be done in our class.	SA	A	D	SD

APPENDIX-2

APPROACHES TO STUDY INVENTORY

Please read one statement at a time and put tick mark (✓) on Yes, No and Unsure.

DA1	I put a lot of effort into trying to understand things which in the beginning seem difficult.	Y	?	N
DA2	I like to fully understand the meaning of what I am asked to read.	Y	?	N
DA3	When I am studying a new topic, I often ask myself questions about it which the new information should answer.	Y	?	N
R11	I try to relate ideas from one Topic to those in others, whenever possible.	Y	?	N
R12	In trying to understand new ideas, I often try to relate them to real life situations to which they might apply.	Y	?	N
R13	I find it helpful to be clear about a new topic by seeing how the ideas fit together.	Y	?	N
UE1	In my practical work, I like to think about many ways of looking at facts.	Y	?	N
UE2	I like the kind of problems where I have to work through the materials to reach a logical conclusion.	Y	?	N
UE3	When I am reading an article I generally compare the facts with the findings.	Y	?	N
IM1	My main reason for being here is so that I can learn more about the subjects which really interest me.	Y	?	N

IM2	I find that studying courses can often be really exciting.	Y	?	N
IM3	I find course topics so interesting, I should like to continue with them after I finish this course.	Y	?	N
SA1	I find I have to mug a good deal of what we have to learn.	Y	?	N
SA2	I don't have time to think about the meaning of what I have read.	Y	?	N
SA3	Often I find I have read things without having a chance to really understand them.	Y	?	N
SB1	I like to be told clearly what to do in essays.	Y	?	N
SB2	I prefer that courses are highly organised.	Y	?	N
SB3	I tend to read very little beyond what's required for syllabus.	Y	?	N
FF1	The continuous pressure of home work and competition often makes me tense and depressed.	Y	?	N
FF2	A poor first answer in an exam. makes me nervous.	Y	?	N
FF3	Having to speak at class is quite painful to me.	Y	?	N
EM1	I chose my present courses mainly to give me chance of a really good job afterwards.	Y	?	N
EM2	I generally choose courses more from the way they fit in with career plans than my own interests.	Y	?	N
EM3	I am more interested in the certificate I will get than in the course I am taking.	Y	?	N
ST1	When I am studying a subject, I try to think exactly what the particular teacher seems to want.	Y	?	N
ST2	If conditions are not right for my study, I change them.	Y	?	N

ST3	One way or another I get hold of the books I need for studying.	Y	?	N
DS1	I find it difficult to use my study time effectively.	Y	?	N
DS2	My habit of putting off studies leaves me with too much to do at the end.	Y	?	N
DS3	I am rather slow at studies in the evening.	Y	?	N
NA1	Often I think whether the work I am doing in the class is really useful.	Y	?	N
NA2	When I look back, I sometimes think why I ever decided to come here.	Y	?	N
NA3	I certainly want to pass the next exam, but it does not really matter, if I am only on the border (pass).	Y	?	N
AM1	I enjoy competition : I find it exciting.	Y	?	N
AM2	It is important to me to do really well in the class.	Y	?	N
AM3	It is important to me to do things better than my friends.	Y	?	N
CL1	Ideas in books often set me off on long chains of ideas of my own, only little related to what I was reading.	Y	?	N
CL2	In trying to understand a puzzling ideas I let my imagination free to begin with, even if I don't seem to be much nearer a solution.	Y	?	N
CL3	I like to play around with ideas of my own even if they do not get me very far.	Y	?	N
GT1	In trying to understand new topics, I often explain them to myself in ways that other students don't seem to follow.	Y	?	N

GT2	I am often criticized for writing unrelated things into my essays.	Y	?	N
GT3	I am a bit too ready to conclude without waiting for all the facts.	Y	?	N
OL1	I prefer to work each part of a problem in order, working out one at a time.	Y	?	N
OL2	I prefer to follow well tried out approaches to problems rather than anything different.	Y	?	N
OL3	I like to start straight away with the details of a new topic and build up the whole problem in that way.	Y	?	N
IP1	Although I generally remember facts, I find it difficult to fit them together into one whole.	Y	?	N
IP2	Teachers want me to be different in making use of my own ideas.	Y	?	N
IP3	I tend to remember things best if I concentrate on the order in which the teacher presented them.	Y	?	N

Name :

Stream : Arts/Science/Commerce.

Sex : Male/Female

Institution : School/College

Marks in the 1st terminal examination:

APPENDIX-3.

KIRTON ADAPTOR INNOVATOR INVENTORY

Directions :

This form of questionnaire assesses your opinion about yourself. Please indicate your opinion about each questionnaire statement by circling. For example SA, A, D, SD.

SA If you strongly agree
A If you agree
D If you disagree
SD If you strongly disagree

1.	Has original ideas.	SA	A	D	SD
2.	Proliferates ideas.	SA	A	D	SD
3.	Is stimulating.	SA	A	D	SD
4.	Copes with several new ideas at the same time.	SA	A	D	SD
5.	Will always think of something when stuck.	SA	A	D	SD
6.	Would sooner create than improve.	SA	A	D	SD
7.	Has fresh perspectives on old problems.	SA	A	D	SD
8.	Often risks doing thinks differently.	SA	A	D	SD
9.	Likes to vary set routines at a moments notice.	SA	A	D	SD
10.	Prefers to work on one problem at a time.	SA	A	D	SD
11.	Can stand out in disagreement against group.	SA	A	D	SD

12.	Needs the stimulation of frequent change.	SA	A	D	SD
13.	Prefers changes to occur gradually.	SA	A	D	SD
14.	Is thorough.	SA	A	D	SD
15.	Masters all details painstakingly.	SA	A	D	SD
16.	Is methodical and systematic.	SA	A	D	SD
17.	Enjoys detailed works.	SA	A	D	SD
18.	Is (not) a steady plodder.	SA	A	D	SD
19.	Is consistent.	SA	A	D	SD
20.	Imposes strict order on matters within own control.	SA	A	D	SD
21.	Fits readily into the system.	SA	A	D	SD
22.	Conforms.	SA	A	D	SD
23.	Readily agrees with the team at work.	SA	A	D	SD
24.	Never seeks to bend on break the rules.	SA	A	D	SD
25.	Never acts without proper authority.	SA	A	D	SD
26.	Is prudent when dealing with authority.	SA	A	D	SD
27.	Likes the protection of precise instruction.	SA	A	D	SD
28.	Is predictable.	SA	A	D	SD
29.	Prefers colleagues who never rock the boat.	SA	A	D	SD

30. Likes bosses and work patterns which are consistent.	SA	A	D	SD
31. Works without deviation in a prescribed way.	SA	A	D	SD
32. Holds back ideas until obviously needed.	SA	A	D	SD

Name :

Stream : Arts/Science/Commerce

Sex : Male/Female

Education : (Last degree obtained).

a) Father :

b) Mother :

Income :

Teaching Experience :

APPENDIX - 4

INTERCORRELATION MATRIX AMONG ASI ITEMS

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
.	14																																															
.	07	00																																														
.	-10	-04	13																																													
.	03	11	18	08																																												
.	02	15	31	19	-04																																											
.	17	-08	20	12	22	03																																										
.	12	27	11	-06	15	18	03																																									
.	-06	21	07	08	07	16	24	14																																								
10.	08	09	13	14	04	11	14	24	15																																							
11.	18	22	17	-05	05	50	08	23	04	-01																																							
12.	-06	15	18	17	15	27	22	02	02	02	15																																						
13.	-01	01	-06	-01	-06	-18	03	03	+03	03	-07	-19																																					
14.	04	-08	-14	-01	-18	01	02	-13	-04	+00	00	03	19																																				
15.	01	-12	-14	-08	-15	05	-08	-03	03	07	-14	-02	-02	19																																			
16.	-04	-09	-04	-16	04	-11	-01	-01	00	00	-11	-02	10	08	19																																		
17.	20	40	28	-08	11	29	14	21	07	+00	48	16	-05	-11	-21	-09																																	
18.	03	-02	03	06	-05	16	11	-05	-20	-09	10	16	-08	07	-15	-20	01																																
19.	-08	05	04	-01	-05	13	-01	-16	-09	08	06	06	-12	-08	-12	-13	-09	16																															
20.	06	03	13	20	-07	15	19	-04	04	18	04	18	-01	09	-02	-13	08	17	01																														
21.	-06	-11	-20	-20	-20	-26	-14	-16	-09	-23	12	-09	19	16	09	13	-14	-02	-01	02																													
22.	05	-04	-07	00	-20	00	05	-10	-08	02	-03	-03	05	04	05	06	02	-08	-03	21	06																												
23.	-11	-02	16	08	-01	09	03	02	14	14	10	05	13	02	19	21	02	34	-18	06	01	20																											
24.	-03	-01	-04	-14	11	-16	-01	-10	-09	-12	-07	04	-01	12	05	03	-17	-02	12	23	07	-03	-01																										
25.	12	04	11	-03	03	19	07	00	01	01	29	00	08	-09	-33	-07	21	25	-17	04	-01	-04	-13	00																								
26.	03	22	09	04	-02	07	11	05	33	04	07	05	00	00	-11	-10	13	-05	14	05	-13	-04	-11	-06	-09																						
27.	05	09	32	07	08	34	03	31	28	21	24	06	-07	21	01	-08	27	05	-04	05	-17	-09	17	42	10	20																					
28.	-10	-05	-03	12	14	05	03	05	-17	-10	-03	10	-08	-09	-08	-34	-03	31	25	06	-08	-04	26	-03	03	01	07																				
29.	-01	-13	-18	-30	-12	-24	-24	-07	-19	-12	-19	-23	11	00	-07	05	-16	09	-01	00	28	-03	-03	-04	03	-19	00	06																			
30.	-08	-08	-16	-11	-06	-20	-14	-04	00	-12	-11	-10	06	16	17	11	-19	-13	05	-02	21	03	05	02	-10	-02	06	06	20																		
31.	-01	-04	-08	-01	-13	00	-09	00	31	-16	-04	15	-10	00	-17	-35	04	42	17	17	02	-08	-04	-07	07	-06	-12	41	06	02																	
32.	-21	-13	-03	-05	-08	-10	-04	-17	-16	-06	-02	-01	25	09	-04	02	-11	03	-09	-08	10	09	07	09	07	15	-16	08	04	00	13																
33.	05	-10	-06	07	09	04	-03	-10	04	-03	07	09	33	21	11	23	-09	-03	32	05	01	05	18	11	08	-14	-03	-11	11	08	22	18															
34.	-04	-04	22	-01	-10	20	15	20	17	01	30	11	-07	-02	00	06	18	09	16	-07	-05	-02	06	-07	16	11	22	12	-15	-01	10	-03	01														
35.	-03	-03	30	11	-07	38	20	25	11	28	27	-07	-04	-01	-03	-09	21	13	-09	11	-15	11	15	-15	19	05	30	-04	-13	-14	-09	05	-11	25													
36.	10	-03	20	00	-01	21	27	33	19	-04	42	05	-10	-12	09	04	40	-03	-08	03	-12	06	16	-21	12	20	44	10	-11	-03	-07	-03	-06	38	32												
37.	-03	08	-23	-10	-12	-09	-17	05	-01	-01	-02	-11	15	19	10	15	-08	-05	-09	00	16	10	09	-01	-02	-19	-02	-09	21	25	01	02	08	-06	-03	-08											
38.	10	06	13	00	02	-06	06	-08	-13	-02	-02	03	04	-09	-13	-21	13	15	03	11	00	07	03	-05	16	05	07	05	11	-09	09	-12	-19	-05	-02	-01	04										
39.	11	11	16	-02	13	02	05	10	-08	02	02	07	04	-02	-21	-10	06	19	09	-02	-07	-04	-19	04	34	-04	05	15	04	-09	08	01	-06	14	08	-08	-03	26									
40.	10	-03	12	09	03	14	14	05	16	-06	16	07	-06	-03	-01	05	14	-07	04	-11	-27	14	12	-19	-05	14	03	-05	-10	-13	-10	-14	-09	16	01	26	-15	03	00							
41.	-14	-10	-08	02	06	-10	04	02	-10	00	-12	-05	01	14	17	12	-11	03	11	-04	-02	08	08	09	-33	-03	-15	+17	-08	05	04	24	-03	00	08	-09	-09	-11	-04	-03						
42.	-03	-13	-23	-08	-04	-11	-10	-09	-04	-10	-06	-08	14	11	12	01	-15	-03	-21	05	31	-05	10	06	09	-13	-10	-06	15	17	-04	19	26	-09	-14	-10	06	-07	-09	-16	05						
43.	07	-05	20	11	-02	18	-02	14	-01	33	15	-08	02	08	-10	02	12	-04	01	-01	-25	04	-07	-03	03	13	07	-09	18	24	-05	10	01	-07	18	08	-11	03	-01	04	-02	27				
44.	02	-03	08	40	09	11	26	-09	04	22	-09	16	-03	-02	-07	-09	-04	21	10	11	-27	-04	-05	00	-03	08	-01	22	-31	-07	07	06	15	18	09	-10	-23	-05	08	-05	20	-07	08			
45.	-01	-01	13	-14	02	05	13	00	12	-02	20	-04	04	-17	-21	-15	16	24	13	21	03	06	-08	-09	26	-04	06	00	13	-12	23	-07	31	08	13	08	08	26	20	07	-20	-13	03	-18		
46.	08	02	01	12	02	-01	10	-07	-06	01	-07	04	08	14	12	08	-07	18	08		03	05	07	03	03	-15	08	09	00	15	-08	01	11	-04	-01	-11	11	13	13	-09	25	22	-14	15	-11		
47.	08	05	06	20	-15	21	00	07	08	04	-03	00	-25	-03	05	-03	08	10	14	24	-10	02	02	-15	-08	-06	14	04	-06	07	11	-27	26	12	10	12	-04	06	-07	23	06	-12	03	19	10	01	
48.	10	19	39	-13	13	21	13	04	27	01	09	00	-04	-11	-10	08	28	-10	-02	17	-13	04	10	-04	06	26	05	-12	-13	-16	21	-09	05	-01	-16	09	-11	-08	-02	60	-10	-08	06	04	02	-06	01

* $p < .05$; ** $p < .01$; Decimal points are omitted for convenience.

APPENDIX-5

TABLE 46: INTERCORRELATION MATRIX OF KAI ITEMS

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1.																																
2.	**41																															
3.	07	*30																														
4.	*27	*27	09																													
5.	-02	11	07	18																												
6.	03	-02	08	01	18																											
7.	**35	*28	16	*28	03	-01																										
8.	19	**39	**40	*27	*05	*28	11																									
9.	12	**41	*27	-02	09	04	22	*32																								
10.	-01	-00	25	-09	01	-01	**40	-09	20																							
11.	13	-04	06	15	*27	*30	-20	04	-13	-20																						
12.	16	05	-03	07	15	02	18	04	13	-10	09																					
13.	07	-16	01	-08	07	-15	-01	-17	*-28	*28	12	*27																				
14.	*27	18	20	14	21	-14	**39	00	-01	**39	**35	13	**42																			
15.	18	*26	**47	09	08	00	**54	11	11	**39	03	19	18	**44																		
16.	16	17	18	**36	21	-04	**35	02	07	**44	19	-09	*29	**51	**39																	
17.	10	08	11	14	14	06	01	18	-05	09	28	-15	23	43	26	56																
18.	11	*26	-05	07	21	16	04	10	20	*-26	12	-12	*-30	-11	-06	-03	04															
19.	-02	07	*33	06	-09	06	07	-02	-05	-05	-14	-09	-04	-07	**38	-06	-12	03														
20.	14	-09	16	-06	-17	-04	10	-00	05	10	04	10	23	**36	12	09	06	-16	08													
21.	24	-07	-15	-05	-01	04	02	-03	-08	-11	*32	11	42	35	-03	16	*27	08	02	25												
22.	05	-01	06	07	02	07	14	17	-12	31	*27	-02	20	**38	*26	07	10	01	02	08	**35											
23.	*26	**34	20	-03	09	09	01	22	23	-03	-04	-09	-03	13	00	08	04	*26	-04	05	*31	03										
24.	-02	-21	-02	-23	-06	13	*-29	**00	-15	02	20	-14	*29	01	-07	-07	07	12	09	*30	**38	**40	23									
25.	-12	-22	08	-13	05	11	-10	19	-02	04	22	*30	24	22	15	-15	01	-23	06	**36	*33	*30	04	*33								
26.	*29	-09	19	06	-03	-05	*28	00	-16	09	*29	22	*28	**55	**39	05	11	-08	18	**50	*33	**37	06	17	**36							
27.	25	-04	15	01	00	04	-02	09	*30	07	00	-12	-10	-04	09	04	-12	18	*29	15	12	10	*29	20	01	11						
28.	00	03	05	20	14	16	14	12	**36	17	00	08	-06	03	20	25	-06	04	03	23	-03	17	-06	00	25	06	**44					
29.	00	21	00	-15	01	02	-15	-09	-08	-04	-02	-19	09	05	22	-14	-06	13	*28	08	14	**40	04	22	09	02	21	*26				
30.	-05	21	13	16	14	20	07	06	08	09	14	00	00	13	*28	18	06	06	21	10	08	**43	-05	02	*33	14	12	**57	**46			
31.	23	-05	00	-04	16	24	*32	-05	-05	**35	22	01	00	**42	*33	21	07	11	-07	*33	20	**50	19	*31	*30	**45	*29	**36	19	*33		
32.	12	10	-05	01	14	05	-08	17	00	-13	15	-03	*27	14	-01	16	*27	25	03	14	25	14	11	*27	17	13	17	00	15	21	16	

* $p < .05$, ** $p < .01$ Decimals points are omitted for convenience.