Understanding Impact of Learning Style on Academic Achievement: An Exploration in Context of Secondary School Students

Dissertation

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CERTIFICATE

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Dated:

This to certify that I **Parveez Ahmad Lone** have carried out the research embodied in the present dissertation, **"Understanding impact of learning style on academic achievement: An Exploration in context of secondary school students."** For the full period prescribed under M.Phil. Education ordinance of the University. I declare to the best of my knowledge that no part of this dissertation was earlier submitted for the award of research degree of any University.

The present work as above has been carried out under my Supervision and the declaration as above by the scholar is correct to the best of my **k**nowledge.

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Chapter-1

CONCEPTUAL FRAMEWORK

Academic achievement has always been considered to be a very important factor in the educational life of an individual, because good academic record over years predicts future success of a person. Education is unique asset and academic achievement is an essential aspect of it. The educational status of an individual in a society is greatly depicted through the academic achievement. Since time immemorial academic achievement of students has been a great concern to educationist. This trend has been now intensively felt by the academicians, parents and students. Strikingly, academic achievement has become a destructive index in determining a child's future. The prediction of academic achievement has been given greater importance during recent years because of various reasons. One of the reasons is the mushroom growth in student population which has created a lot of problems. The second is that child education has not been found to be commensurable with the efforts and huge expenditure made in this field. The third is concerned with the wastage of great human potentiates because it is often found that student perform much below their capacities. Nevertheless, both students and teachers share the same goal i.e. to reach optimal learning. Educational programs and courses that are responsive to diverse student populations and their individual differences are essential. The question is why? The psychology of human differences is fundamental to learning and it opposes a one-size-fits-all approach to education. Therefore, for a learning environment to be optimally effective, it should capitalize not only on contextual but also the learner's characteristics. It is good practice to recognize and accommodate individual differences as well as to present information in a variety of ways through more than one modality. Educational institutions in order to capitalize the maximum intellectual resources of our youth; it is time for us to be the champion of individual differences. Educationalists looking for excellently competent professionals has to recognize the variances in how their pupils learn and identify their critical thinking abilities **(Gabel, Krueger & Curry, 2007)** and then consider how best to optimize the learning process. Unfortunately, educators teach the students as the differences between them do not exist and on the other hand they study the effect of learning process **(Bojanczyk, &Lanphear and Paul 1994).** Learners, in response, generally feel disappointed with the strategies and processes of learning and mostly perceive as

lacking relevance in the study material. **(Cohen and Eyal 2006).** Accordingly, performance often differs, from individual to individual and educators get puzzled with these variations. Rejecting these variation in thinking and learning process does not promote adjustment in the overall process of learning. However promoting these differences in students can increase deeper thought of knowledge **(Mighten & Johnson 2005).**

Therefore, knowledge of student's learning style preferences and identification of their possible strengths and weaknesses will help educators to structure course content appropriately, thereby improving student learning and engagement in the education process. It will also improve students' self-awareness of how they learn best and what they can do to maximize learning opportunities. In order to gain basic understanding of academic achievement, different students are using different learning styles. Some may learn through touch, and some through direct participation in any activity. It means that every child has a unique type of learning style which suits him the best.

1.1 LEARNING STYLE

Learning style may be defined as the individual's natural, routine and favored way of gripping, handling and remembering new knowledge and skills **(Reid, 1987).** The theories of learning style started with the theory of Carl Jung in 1927 who stated the main variations in the method through which the people perceived (intuition vs sensation), and the ways through which they make decisions (rational thinking vs creative feelings), and how energetic or considerate they were while interacting with others (extrovert vs introvert).Therefore, learning style may be defined as the affinity of person towards a particular technique of learning. According to **Keefe (1979)** learning style may be defined as "mixture of physiological , cognitive and affective dimensions which serves as the as a relatively strong indicators of how the student interacts, perceives and responds with the environment of learning." **Stewart and Felicetti (1992)** define learning styles as those "type of environmental conditions in the class room in which a student learns the most". Every one of us can obtain benefit from a diversity of learning experiences. However, it is true that some ways of performing a task are more competent for one individual and not for the others and when the learners are given an opportunity to choose their best ways of learning and

they will learn best than those who are compelled to learn by a style which does not suit them.

Having the knowledge of one's styles of learning can be used to increase self-awareness about their strengths and weaknesses as learners. Keeping onto consideration the learning styles of the students a teacher can organize a class in , cool and warm temperatures, noisy and calm environments, soft and bright illuminations, arrangement of seats, preferences for making groups. We can recognize the patterns in which people tend to concentrate best - alone, with others, with certain types of teachers, or in a combination thereof. We become aware of the senses through which people remember difficult information most easily—by hearing, speaking, seeing, manipulating, writing or note taking, experiencing, or, again, a combination of these. Learning style also encompasses motivation, on-task persistence versus the need for multiple assignments simultaneously, the kind and amount of structure required, and conformity versus nonconformity. **Merill (2000)** argues that most of students are unaware of their learning styles. All the advantages claimed for meta-cognition can be gained by encouraging learners to become knowledgeable about their own learning styles and that of others **(coffield, 2004)**. Once students have brought this knowledge into their level of awareness, they are better suited to choose learning strategies that match their learning styles. This initiates student ownership of the educational process. One of the most significant issues in learning is an individual is taking the responsibility for his/her own learning. The individuals should know what their own learning styles are and what characteristics this style has and they should thereby behave according to this style. In this way, the individual can acquire the constantly changing and increasing amount of information without need for the assistance of others. When the learner takes the responsibility of his/her own learning, s/he then attributes meaning to the process of learning.

1.2 MODELS OF STYLES OF LEARNING

There are various models of learning style, some of the learning styles which are used in the areas of education are discussed as under.

1.2.1 The Myers-Briggs Type Indicator (MBTI)

The model follows the scales which is developed by psychologist namely Carl Jung, which has divided the learners as.

Extrovert learners/ Introvert learners

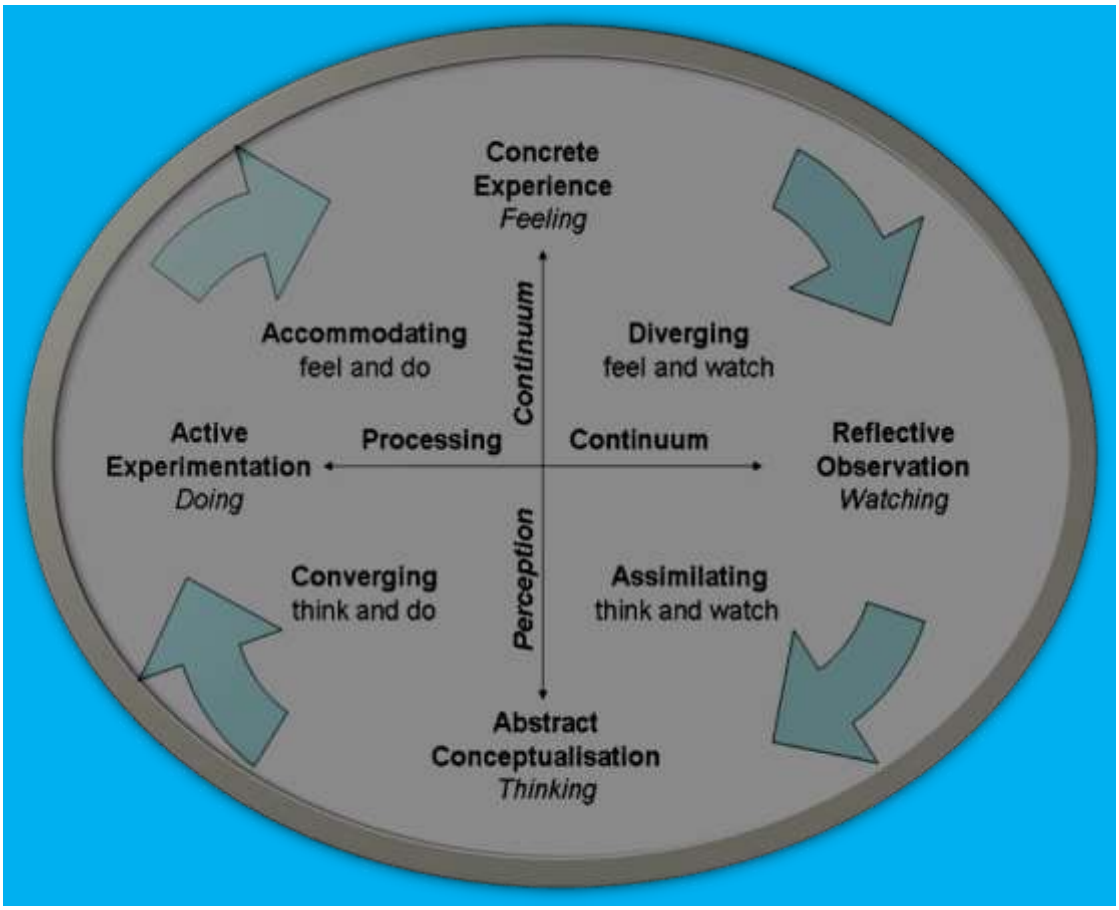
- Extrovert learners: These are the interactive type of learners.
- Introverts learners: These type of learners go deep into the inner world of thinking and make hesitation while interacting with others.

- **Sensor type of learners/Intutior type of learners**
  - Sensor type of learners: They are pragmatic, need detailed explanations and there centre of attention is on realities and processes; and
  - Intuitor type of learners: They are creative, thoughtful and their centre of attention are the ways and the means of doing some work.
- **Thinkers/ Feelers**
  - Thinkers: They are cynical and tend to make decisions based on reason and a set of laws.
  - Feelers: They are capable of taking decisions which are based on judgements of humanistic perspective.
- **Judgers/ Perceivers**
  - Judgers: They set and follow agendas, look for closure even with imperfect data.
  - Perceivers: Those learners possessing this type of capability helps them to adjust according to the changing situations.

1.2.2 Learning Style Model by David Kolb

According to this model the preferences of students are classified on the basis of various parameters such as how a student grasp and internalize the information while learning. The styles of learning given by him are discussed as under.

FIGURE A: KOLB'S MODEL OF LEARNING STYLE



Source: Research into style of learning by David Kolb 2011 - N M Slater

- **Type 1 (concrete and reflective type of learners):** The most important feature of this learning style is "why". In this type the learners respond well to how the study material is related to their interests, knowledge and the upcoming experiences. The instructor should act as motivator with these types of learners.

- **Type 2 (abstract/ reflective type of learners):** The most important attribute of this type of learning style is *"What?"* In this type of style the information is presented to the learner in systematic and rational way. The instructor should act as an expert in this type of learning style.

- **Type 3 (abstract/ active type of learners):** The most valuable quality of this type of learning type is *"How?"* In this type of style the learners act in response to having opportunities to seek by the process of trial –error method it helps the learner to allow them in the environment to work on the planned objectives. The teacher should act as a coach by giving giving guidance and providing feedback to the students.

- **Type 4 (concrete/ active):** The most important feature of this learning style is the question of *what if*. In this type the learners like using the course content in new situations to resolve real and practical problems. The teacher should give maximum freedom to the students to construct and discover things for themselves.

1.2.3 Learning Style Model by Felder-Silverman

According to this model the learners may be classified as under:-

- **Sensing learners** (realistic and actual concerned with evidences and processes) or **intuitive learners** (theoretical, inventive and are concerned with principles and significances).
- **Visual learners** (these type of learners prefer the presentation of material in the form of figures, diagrams and charts prefer visual representations) *or* **verbal learners** (these type of learners should have the learning material in the form of oral and written descriptions).
- **Inductive learners** (They prefer presentations that will follow the procedure from the specific to the general) or **deductive learners** (They prefer presentations that follow the procedure of going from the general to the specific).
- **Active learners** (They type of learners learn by discovering things out, and are interested in working with others) or **reflective learners** (They learn by thinking on things deeply and are interested in working lonely).
- **Sequential learners** (They follow the linear systematic approach and learn in small incremental steps) or **global learners** (They use the holistic approach and learn through the large dives).

1.2.4 Types of Styles of Learning According to the Learning Style Inventory Used in the Study

1. **Enactive Reproducing style:-** in this type of learning style emphasis is on the concrete experiences and is based on imitation and practice. It is based on the reproducive orientation.
2. **Enactive Constructive style: -** in this type of style main emphasis is given on the processing of enactive information.

3. **Figural Reproducing style: -** This type of learning style indicates that the learning occurs mainly through maps, charts, pictures, models, diagrams and photographs. It is reproduction oriented and is based on imitation and practice.
4. **Figural Constructive style: -** it emphasis on the figural experiences which will take to the conceptualization.
5. **Verbal Reproducing style: -** it is based on the information which is mainly given through written or spoken modes.
6. **Verbal Constructive style: -**The main emphasis is given to conceptualization which is based on reflective, abstractive and accommodative thinking.

Type first and second can be grouped together to form enactive style of learning and third and fourth may be clubbed together to form figural style of learning. First, third and fifth style are grouped together to form reproducing style of learning. While as second, fourth and sixth are grouped to make the constructive style of learning.

1.3 ACADEMIC ACHIEVEMENT

Academic achievement is playing a very significant role for determining the learning and the whole educational carrier of an individual. It has become one of the best goals which an individual has to achieve in the educational career of his life. In this present competitive era academic achievement has become a key for determining the future of a child. It is also a major goal, which every individual is expected to achieve in his field of life. Academic achievement is a key index by which an individual learns about his strengths and weakness, abilities and competencies which play an important role for developing career objectives. One of the most important outcomes of any educational set up is achievement of the students. Depending on the level of achievement, individuals are characterized as high achievers, average and low achievers. Taylor (1964) states that the value the student places depends upon his own sound effects of his academic achievement. In an educational institution the academic achievement is taken as any type of learning that is seen in the student's life. Academic achievement means the knowledge gained and the techniques developed by the pupils in the subjects taught in the schools. Hence academic achievement refers the achievement of students in the academic subjects. Academic achievement is a dynamic process. It plays a very significant and vital role in the attainment of harmonious development of child in all walks of life. Academic Achievement in

general refers to the degree of proficiency attained in some specific area, concerning some scholastic and academic work.

Academic achievement which is an important dimension of education and is considered output of education to which the students and teachers or the educational institution trying to reach towards the goals of learning. Academic achievement is most commonly assessed by taking examinations or continuous assessment but there is no general accord on how it is best tested or which aspect is more important — practical knowledge such as skills or declarative knowledge such as facts.

When the students find themselves secure, busy, and appreciated, they can focus on their academic goals of their life. Every good chartered educator makes sure that these needs are met. Character education is the base through which students can reach the academic achievement. It is not teaching the children to be good. It is teaching them to be their best of their level possible.

When a person gets very high grades in any course of his academic carrier, this is an example of academic achievement.

When a person gets admitted in a college or a university, this is also an example of academic achievement.

Crow and Crow (1956) achievement refers to the level by which student is getting benefit from the instructions received in the field of learning.

Academic Achievement is the result of learning, the extent to which the learners, teachers and the whole institution has achieved their goals of learning. This is evaluated either by examinations or continuous assessments and the goals may, vary from individual to individual.

According to **Webster's Dictionary (1990)** academic achievement of students is the performance of students in a course based on the plan studied in an organization of learning.

According to **Steinberg (1993)** academic achievement encompasses learner's talent and performance. It is a multidimensional and related to human growth and development such as cognitive, emotional, social and physical development.

Torres (1994) stated that academic achievement may be defined as the ability or the level of competence expressed in grades or marks based on wide sampling of pupils performance is usually measured by standardized tests.

Kerlinger (1995) Stated that academic achievement is a complicated process. It is the observation of those behaviors of the children which are connected with the

Mastery of learning of school task, reading Tests, reading words, doing arithmetic problems, drawing of diagrams etc.

According to **Oxford Dictionary of Advanced Learner (2000)** the meaning of Academic achievement is the output of the learning of students in a particular subject or in a group of several subjects combined by using his/her efforts and skills in a well-planned manner. Hence academic achievements may be defined as the quality and quantity of learning gained in a subject or group of various subjects after attending a group of institutions.

1.4 SIGNIFICANCE OF THE STUDY

Today the world is undergoing a change at every second. Along with the scientific and technological development, complexities of life are increasing every day. In order to meet one's psychological and physiological needs, one has to strive hard to adjust himself in the present competitive world. Academic achievement is the key instrument which helps the students in making better adjustments in life. Good academic achievement is the key to success in personal and professional life. It brings economic security and social respect. It makes a person globally competent individual. Academic Achievement depends on various cognitive and non-cognitive factors like, aptitude, achievement motivation, socio-economic conditions, attendance, personality traits and teaching learning methods. The way of learning is one of the factors that may influence the academic achievement of the learners. Every student has a unique type of learning style by which he or she learns the best. Some may learn best through lectures, some may learn by showing figures, some may learn by writing the learning material while as some may learn best by doing some work in any activity. The teacher should have the knowledge of all the learning styles and while teaching teacher has to take into consideration the learning styles of all the students in the class room.

Having the knowledge of different learning styles of the students and their strengths and weaknesses in these learning styles helps the educational planners to frame the course content accordingly and therefore helping the students in their learning and their active involvement in their learning process. Learning style is important because of various reasons; however, there are three fundamental ones. First of all, students learning styles will vary because every person in this world

differs from others naturally. Secondly, it provides the chance to teach by applying a variety of methods in an efficient way. Teaching by just one method unthinkingly will create a boring environment in the classroom; accordingly students will not get benefitted from the lesson taught in the classroom. Meanwhile, the learning and teaching will be just in terms and not in the world of reality. Thirdly, we can handle many things in learning process if we really recognize the groups we are called to, although, we may not be aware of every detail; however, being aware of our students learning styles, mental characters, emotional qualities and motivational differences will help us to have control on our lessons appropriately and according to the changing circumstances **(McCarthy, 1982; Felder, Silverman, 1988; Coffield et al., 2004).** Learning style plays an important role in the life of an individual. A person educated in an area having no relationship to his/her learning style may lack confidence and she/he may be less successful; s/he may as a result become frustrated. Knowledge of learning style also provides information to the student as to why she/he has learnt in a different way than others. It helps to control the process of learning. It is vital because one of the most important signals in learning is to learn to be autonomous, that is, for the individual to take responsibility for his/her own learning. Briefly, confidence in learning will consistently enhance when learners know how to learn.

Numerous studies have been conducted on student's individual differences in terms of learning styles and other variables. It is evident from the facts the research has been done in this field on the relationship between academic achievement and learning style but little research has been done on learning styles and academic achievement of secondary school students of Jammu district. Hence, it is noteworthy to apply the learning styles (Enactive, Figural Verbal, Reproducing and Constructive learning styles) effect on the academic achievement among secondary school students of Jammu district.

1.5 STATEMENT OF THE PROBLEM

On the basis of the above discussion the problem can be stated as under:

Understanding impact of learning style on academic achievement: An exploration in context of secondary school students.

1.6 DEFINITIONS OF THE KEY TERMS:

1.6.1 LEARNING STYLE:

It is the way in which one represents internally his experiences and processes and recalls knowledge or information. This style of learning can be measured through the scores obtained by the learners on the inventory of learning style which is developed by K.S Misra. This inventory attempts to measure six main learning styles namely-Enactive Reproducing, Enactive Constructive, Figural Reproducing, Figural Constructive, Verbal Reproducing and Verbal Constructive.

1.6.2 Academic achievement:

It can be defined as accomplishment or gain of a performance carried out successfully by an individual or group on the completion of an academic task. In the present study it refers to the percentage of aggregate marks obtained by a particular student of 9^{th} class in first term examination respectively.

1.6.3 Secondary School

A secondary school is a school which provides secondary education, typically between the ages of 11-16, after primary school and before higher education.

1.7 OBJECTIVES OF THE STUDY:

The objectives of the study were written as under:

1). To study the impact of learning style on the academic achievement of the secondary school students.

2). To study the impact of learning style on the academic achievement of the secondary school students with reference to their.

- 2.1. Enactive reproducing learning style.
- 2.2. Enactive Constructive learning style.
- 2.3. Figural reproducing learning style.
- 2.4. Figural Constructive learning style.
- 2.5. Verbal reproducing learning style.
- 2.6. Verbal Constructive learning style.

3) To study the impact of learning style on the academic achievement of the secondary school students with reference to their

3.1. Enactive learning style

3.2. Figural learning style

3.3. Verbal learning style

3.4 Reproducing learning style

3.5 Constructive learning style

4). To study the impact of learning style on the academic achievement of secondary school male students

5). To study the impact of learning style on the academic achievement of the secondary school male students with reference to their.

5.1. Enactive reproducing learning style.

5.2. Enactive Constructive learning style.

5.3. Figural reproducing learning style.

5.4. Figural Constructive learning style.

5.5. Verbal reproducing learning style.

5.6. Verbal Constructive learning style.

6) To study the impact of learning style on the academic achievement of the secondary school male students with reference to their

6.1. Enactive learning style

6.2. Figural learning style

6.3. Verbal learning style

6.4 Reproducing learning style

6.5 Constructive learning style

7). To study the impact of learning style on the academic achievement of secondary school female students

8). To study the impact of learning style on the academic achievement of the secondary school female students with reference to their.

8.1. Enactive reproducing learning style.

8.2. Enactive Constructive learning style.

8.3. Figural reproducing learning style.

8.4 Figural Constructive learning style.

8.5. Verbal reproducing learning style.

8.6 Verbal Constructive learning style.

9) To study the impact of learning style on the academic achievement of the secondary school female students with reference to their

9.1. Enactive learning style

9.2. Figural learning style

9.3. Verbal learning style

9.4 Reproducing learning style

9.5 Constructive learning style

10). To study the impact of learning style on the academic achievement of rural secondary school students

11). To study the impact of learning style on the academic achievement of the rural secondary school students with reference to their.

11.1. Enactive reproducing learning style.

11.2. Enactive Constructive learning style.

11.3. Figural reproducing learning style.

11.4. Figural Constructive learning style.

11.5. Verbal reproducing learning style.

11.6. Verbal Constructive learning style.

12) To study the impact of learning style on the academic achievement of the rural secondary school students with reference to their

12.1. Enactive learning style

12.2. Figural learning style

12.3. Verbal learning style

12.4 Reproducing learning style

12.5 Constructive learning style

13). To study the impact of learning style on the academic achievement of urban secondary school students

14). To study the impact of learning style on the academic achievement of the urban secondary school students with reference to their.

14.1. Enactive reproducing learning style.

14.2. Enactive Constructive learning style.

14.3. Figural reproducing learning style.

14.4. Figural Constructive learning style.

14.5. Verbal reproducing learning style.

14.6. Verbal Constructive learning style.

15) To study the impact of learning style on the academic achievement of the urban secondary school male students with reference to their

15.1. Enactive learning style

15.2. Figural learning style

15.3. Verbal learning style

15.4 Reproducing learning style

15.5 Constructive learning style

1.8 HYPOTHESES OF THE STUDY:

In the light of the above objectives the hypotheses of the study can be formulated as under

1). There will be no significant impact of learning style on the academic achievement of the secondary school students.

2). There will no significant impact of learning style on the academic achievement of the secondary students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

3). There will no significant impact of learning style on the academic achievement of the secondary school students with reference to their

I. Enactive style of learning

II. Figural style of learning

III. Verbal style of learning

IV. Reproducing style of learning

V. Constructive style of learning

4). There will be no significant impact of learning style on the academic achievement of the secondary school male students

5). There will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

6). There will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V. Constructive learning style

7). There will be no significant impact of learning style on the academic achievement of the secondary school female students

8). There will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

9). There will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V. Constructive learning style

10). There will be no significant impact of learning style on the academic achievement of the rural secondary school students

11). There will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

12). There will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V. Constructive learning style

13). There will be no significant impact of learning style on the academic achievement of the urban secondary school students

14). There will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

15). There will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V Constructive learning style

1.9 DELIMITATIONS OF THE STUDY

The study is delimited in the following manner:

1. The study is delimited to only district Jammu.
2. The study is delimited to the IX class students only.
3. The present study is delimited to government schools only.
4. The sample for the present study consists of 245 students only
5. The investigation has been confined to 9 secondary schools of Jammu district

Chapter 2

REVIEW OF RELATED LITERATURE

Review of related literature plays an important role in the planning and then execution of any research work. Review of related literature is a written summary of articles, books, journals and other documents which acts a torch bearer for the present and the past and gives the deep insight regarding the topic. Review of related literature documents the need for proposed study. According to **Best (1963)** literature of the problem having the familiarity helps the students to discover what is known already, and what others have attempted to find out.

2.1 ORDERING OF SOURCES OF LITERATURE REVIEW MATERIALS FROM SUMMARIES TO EARLY STAGE MATERIAL

Low standards to ensure quality

Early stage material

Papers posted in web site, professional association newsletters,

Drafts of papers for conference presentations

Indexed Publications

Conference papers, dissertations, theses, college and university publications

Journal Articles

Refereed, non- refereed, International, national, regional state

Books

Research studies, essays

Summaries

Encyclopedias, research reviews, handbooks, abstract

High standards to ensure quality

Source: Libutti and Blandy (1995)

Using this framework, the investigator started reviewing the literature by consulting summaries of research that synthesize numerous studies on the topic under consideration. From these broad summaries the investigator went through various journals, theses, dissertations, and finally to early stage materials.

The existing researches that are directly or indirectly related to present study may be classified under the following headings:

2.2 STUDIES RELATED TO LEARNING STYLES:

Laverne (1981) conducted a study on the gender of the second language students and their learning style preferences. He found that there is no significant correlation between gender of second language students and their learning style preferences.

Agarwal (1982) a study on the learning style preferences of secondary students in with reference to their institution and gender. A sample of 120 students has been taken from the secondary school students from six schools by double-stage random sampling. The results of the study showed that boys and the girls were different from each other in their learning style preferences. The girls were found to have auditory long attention span different from the boys who were found to have visually short attention span.

Hopkins (1982) conducted a study on the learning style of non-traditional learners and the traditional learners enrolled in under graduate course. The results of the study showed that non- traditional students favored the independent, participant dependent styles while as the traditional learners showed good results by learning through the collaborative, competitive and avoidant styles. The results of the study showed that males and the females differ in their learning style preferences. The females indicated their preferences for the dependent, participant and collaborative styles while as the males favored the avoidant, independent and competitive learning styles.

Pederson (1984) a study on learning style preferences with reference to sex. The findings of the study revealed that there is no significant relation between the learning style preferences of the students with reference to their gender.

Lemmon (1985) stated "a school in Hutchinson, Kansas, reported, "that the students showed higher mean scores in reading and math than had achieved for the previous years when they were given freedom in taking the Iowa Basic Skills Test at the time of day and in the seating arrangement that best matched their learning styles"**(as cited in Neely & Alm, 1992).**

Simmons (1986) conducted a study on the modalities, academic achievement and the gender of 6^{th} class students. The results of the study showed that no significant relationship exists between the gender and learning style modalities of the

6th class students. A North Carolina elementary school with a poverty level and minority population achieved 83rd percentile in three years in reading and math on the California Achievement Test which was previously 30th percentile. This change in the school was only due to the introduction of learning-styles instruction **(Andrews, 1990; Shaughnessy, 1998).**

Melton (1990) conducted a study on the Chinese EFL students from middle school to university level. He used the Reid's Perceptual Learning Style Preference Questionnaire in his study. His study was based on a sample of 331 students ranging from university to middle school level for studying the six learning style preferences. The results of the study showed the students showed preferences for various learning styles, and the most preferred one is the tactile learning style and the least preferred is the group learning style.

Verma (1991) studied the relationship between learning style and achievement motivation. The results of the study showed that no significant difference is found in the learning style preferences for flexibility vs non flexibility, Individualistic vs non individualistic, Visual vs aural, field dependence vs field independence between the low and high achievement motivated students. In other words results of the study showed that learning style preferences were independent of motivation.

In South Dakota, a Aberedeen school implemented the learning style model and reported that very good success was achieved by the implementation of learning styles by every teacher in the building **(Neely & Alm, 1992).**

Soliday (1992) conducted a study to examine the differences in preferred learning styles between non vocational education and the vocational education secondary school students. The findings of the study revealed the no significant differences in learning styles were found between the vocational technical education secondary school students with reference to their sex. However significant difference was found between the learning styles of vocational technical secondary school students.

Varma and Thakur (1992) conducted a study on cognitive style and scholastic achievement. The results of the study revealed that (A) Field dependent students showed better performance in social sciences and literature while as the Field independent students showed very high performance in mathematics and physical science (B) Females showed higher achievement in social sciences and literature while as the males showed very good performance in science and mathematics

Vuren (1992) conducted an experimental study to determine the effect of matching learning styles and instruction upon academic achievement of students receiving an interactive learning experience. The sample of this experimental study was 197 chemistry students enrolled in Inorganic Chemistry. The sample was bifurcated into groups which include: abstract sequential, abstract random, concrete sequential and concrete random as specified by the Gregorc Style Delineator. They were given style specific instruction in an interactive learning environment and were compared to a randomly selected control group. The results through analysis of variance "showed a statistically significant difference is found in academic achievement test scores between the control group, which received an unmatched tutorial, and the treatment groups which received a matched tutorial". This study "provided empirical data which supported the use of interactive learning environments as a facilitator between the instructors' teaching style and the students' learning styles". This study revealed that students academic achievement may enhance if the information is given to them in the way which best matches their style.

Pandian (1993) conducted a study on the learning styles and teaching strategies in higher education. The sample of the study includes 1200 science and arts students which were selected by multiple random sampling technique. The results of the study revealed that the cognitive style and the learner's characteristics were found to influence their preference for teaching strategies directly and through learning style.

Verma (1993) a study on university level students**,** studied that the learning style of the students acts due to their locus of control. The results of the study revealed that locus of control does not have any significant relationship with the learning styles of the students. Also with the four learning styles as given by David Kolb the students were found to be alike with the internal and external locus of control.

A meta-analysis of forty-two experimental studies conducted with the Dunn and Dunn model between 1980 and 1990 by thirteen different institutions of higher education revealed that students whose characteristics were accommodated by education interventions responsive to their learning styles could be expected to achieve 75 percent of a standard deviation higher than students whose styles were not accommodated **(Dunn et al. 1995; Shaughnessy, 1998).**

Rosati (1998) reports data conducted a study on Canadian versus US engineering students. The reports of the data showed some differences on the MBTI. He revealed that there were no gender differences within engineering but there appear to be some differences associated with continuing or withdrawal.

In an interview conducted by **Shaughnessy to Rita Dunn**, commented, " those students achieve good scores whose teaching strategy has been changed from traditional to modern way of teaching by the teachers as was reported by the practioners throughout united states. From the findings of the study it was found that after six weeks about 25% of high school students passed the state level examinations and competency tests in order to receive the diplomas of the frontier, new York prior to using the learning style. The ratio of students enhanced to 66% in the starting year of the learning style (1987-88) **(Shaughnessy, 1998).**

The higher standardized achievement test scores resulted among previously failing students when they were taught with strategies that complemented their learning-style preferences although various students learn when the instructional material is provided through the ways that do not complement the learning style preferences **(Beglane, 2001; Burke & Dunn, 2002; Dunn, Griggs, Olson, & Beasley, 1995; Lovelace, 2005).**

Wang, Hinnand Kanfer (2001) found that learning style had no influence on either academic performance outcomes or upon student satisfaction for students using computer supported collaborative learning by using Kolbs learning style inventory. In this study the researcher looked at the changes over a period of time and if it was found the no change in the learning style occurred, it will be revealed the learning style has no influence on academic performance or satisfaction.

Bandy &Young (2002) conducted a study on learning style and the academic performance. They revealed that the change in the style occurs due to various teaching methods but they did not have a relationship against academic performance.

The scale of the Dunn and Dunn Learning Style Model was used in the schools of the district Freeport, Illinois. However all the students showed very high through the standardized achievement tests when using their learning styles. **(Burke & Dunn, 2002).**

Verma (2002) conducted a study on women's learning style with reference to certain demographic factors and academic achievement. The objective of the study was to find out the relation between learning style of women with certain

demographic factors and academic achievement. The sample of this study included 406 women students of 12^{th} class. The results of the study showed that private institutions women students were superior in relation to their independent, dependent and avoidant learning styles and the government school women students were superior to their counterparts on participant learning style; however the women students of arts stream were higher in the use of collaborative learning style than the women students of science stream; however significant difference in dependent, participant and avoidant learning style among high and low achieving women students on the independent and dependent styles, high achievers were superior than low achievers and in the avoidant learning style low achievers were higher than their counterparts high achievers.

Lyan and Khaled (2003) conducted a study on learning style profile of undergraduate learners at UK University in order to study out the relationship between individual differences and the learning style preferences of the learners. The results of the study showed the variations in the learning style preferences and the learners learn best when the information is provided in the manner which suits best with their method of processing and acquiring information.

Lovelace (2005) conducted a Meta–analysis of experimental research on the Dunn and Dunn Model. The results of the study showed that achievement of the students is increased by learning-style responsive instructions or improved the attitudes towards learning or both of all students.

Mohr and Holtbrugge (2009) conducted a study on the management students with reference to learning styles – A Cross-Cultural Perspective. The sample of this study included 953 students from 74 different nations studying in management courses at different universities in Russia, Ireland, Spain, Poland, China, Germany, USA and Netherlands was collected. The results of the study showed that the preferences for learning style differ across the countries and the cultural values also affect the learning style preferences of the learners. From the results of the study it is revealed that there exits important differences in the learning styles between the local and the exchange students and the male and female students.

Zainol Abidin, Rezviee, Abbas Ali, Helan, Nor Abdullah, Kiranjit, Kour and Singh, Balbir (2011) a study was conducted in a specific educational system on learning styles and overall academic achievement. In this survey study total 317 students participated in order to find the relationship. For this study a learning (LSS)

style instrument of Joy Reid's Perceptual Learning-Style Preference Questionnaire (1987) was used. For this study One way ANOVA and multiple regression analysis statistical techniques were used in this study. The analysis of the data showed a significant relationship between overall academic achievement and learning styles. It was also found from the findings that the high, moderate and low achievers have preference for the pattern of learning in all learning styles. Moreover, the framework of the learning style does not change with the subjects, whereas it actually plays a significant role across all the subjects.

Lynne (2011) a study was carried out to study on Students' learning style preferences and teachers instructional strategies. Correlations between matched styles and academic achievement. A data was collected from a sample of approximately 200 students from three schools in different north-western South Carolina districts. A quantitative approach utilizing a correlational design was used to analyze the data and produced Pearson r values for each content area respectively. These results have demonstrated a lack of significant correlation between variables.

Gilakjani (2012) the study was conducted to Study on Visual, Auditory, Kinesthetic Learning Styles and their impacts on English Language Teaching. This Study is an Analysis of Learning Styles for Iranian EFL university students. Over 100 students completed a Questionnaire to determine if their Learning Styles are Auditory, Visual or Kinesthetic. The Finding showed that Iranian EFL University Students Preferred Learning Style was Visual.

Kumar et al. (2012) a study was intended on the gender differences in Learning Style Preferences among Medical Students. A questionnaire was administered to 208 male and female students of 3^{rd} and 4^{th} year medical students during their course of forensic medicine course at SSR Medical College. The Students were allowed to choose multiple answers as per instruction given on the prescribed questions sheet. The scoring algorithm of VARK was then applied to identify the modality preference of each student. The results from a chi square analysis (÷2 =0.710, df = 3 and p = 0.871) indicated that there was no difference in learning preferences by gender.

Mazumder and Karim (2012) Conducted a comparative study on the patterns of learning styles on Students of USA and Bangladesh .The purpose of this study was to ascertain the comparisons and variances among students in learning styles by using Fielder-Silverman model and an index of learning styles, the data

were taken from the Bangladesh and American universities. In this study from the Statistical analysis was accomplished to classify the factors affecting learning style, like number of years spent in the school, social background, and academic achievement. The findings of the study show that there was no difference between the learning styles of American and Bangladeshi engineering students. However, the results discovered a difference between first year (freshmen) and final year (senior) engineering students on the sensing/intuitive dimension. Differences in learning style were also observed between students from diverse academic majors on the sensing/intuitive and visual/verbal dimensions.

Smily, Victor, Ali and Vetrayan(2013) a study was conducted on the learning style preferences in the university of technology of MARC students from the occupational therapy from the semester first, second and third were included in the study from faculty of health sciences UiTM Puncak Alam were included in the sample for this study a cluster sampling method was used for sample selection. Learning style questionnaire consists of 44 questions which help to predict the student's styles of learning out of 4 domains sensory/intuitive, visual/verbal, active/reflective and sequential/global. It was found from the findings of the study most preference learning style was visual (48.2%) followed by active style (16.1%). high preference was also shown on sensing style (10.7%), reflective style (8.0%) and sequential style (7.1%). However, preferences towards other styles were low; 5.4% for global, 2.7% for verbal and only 1.8% for intuitive Style. The maximum students obtained good CGPA were visual learner mostly fall into the CGPA range 3.00 – 3.49 (14.8%) and 2.50 – 2.99 (29.6%), whereas the less score were intuitive learner. But learning styles of students vary according to semester, academic achievement and gender. The findings of the study reveal no significant difference between learning styles of the students according to their academic achievement. However, it was found from the findings that low correlation between learning styles and academic achievement.

Zualkernan, Allert and Qadah a study was conducted on "A Cross-cultural Comparison of Learning Style between the students of The AUS-UMD on computer science students with reference to the learning styles, background features and outcomes. From the findings of the study it was seen that there is strong similarities in learning styles of these culturally diverse students.

Jawaid (2014) conducted a study on the scientific aptitude and learning styles among college going science students of first year degree course Jammu division. The study was based on the sample of 296 (148 male and 148 female).The results show that no significant difference is found in the learning style belonging to rural and urban areas and it was found that there is no significant gender difference in four learning styles among college going students of first year degree courses belonging to high and lower levels of scientific aptitude. No significant gender difference have been found in components of scientific attitude among college science students of first year degree course belonging to urban areas.

2.3 STUDIES RELATED TO ACADEMIC ACHIEVEMENT:

Ramnachandran, R (1990) investigation was conducted on the relationship between academic performances and other psychological variables reasoning, anxiety and adjustment the study investigates the influence of anxiety and adjustment on academic performance. A sample of 500 pupils of standard IX who were selected from the eight schools in Chidambaram Town. Tools used included Taylor‟s Manifest Anxiety Scale, Verbal and Numerical Reasoning Test-Part of the Intelligence test standardized by K. K. Pillai, Adjustment inventory of Tiwari and Sirvastava and school marks register. The collected data were treated using mean, S.D, t-test and coefficient of correlation. (1.) Academic performance was better among (a) girls than boys, (b) children of forward communities than those of backward community, and (c) children of educated parents than uneducated parents. (2) There was a positive and significant correlation between academic performance and total reasoning and numerical reasoning. (3) There was low negative correlation between academic performance and anxiety. (4) There was no significant relationship between academic reasoning and numerical reasoning. (5) There was a low positive correlation between academic performance and adjustment.

Hari Krishnan, M (1992) a study was intended on academic achievement of the students of the higher secondary stage in relation to achievement motivation and Socio-economic status. The objective of the study was to find out the relationship between academic achievement, achievement-motivation and socio-economic status among students. Through the random sampling technique a sample of 300 students were selected. The tools used in the study were school marks, the Achievement-Motivation Inventory of Prayag Mehta and Socio-Economic Status Scale developed

by the researcher. 'T' test and correlation coefficient were used for the data analysis. The findings of the study revealed that the girls obtained a higher mean in achievement than boys. Socio-economic status was significantly related to academic achievement and achievement was not related to achievement motivation.

Mohapatraand Mishra (2000) conducted a study to find out gender difference in achievement problems related to mechanics under Indian conditions. The sample taken consisted of 25 boys and 25 girls of Classes V, VII, IX of D.M. School, Bhubaneswar. Findings include (1) There existed large difference in achievement in mechanics. (2) In Class IX the 't' value was 0.09 which showed there was almost negligible difference in achievement in mechanics of boys and girls.

Agarwal, A (2002) investigated a study on relationship of academic achievement of boys and girls with intelligence, socio-economic status, size of the family and birth order of the child.

The study was intended to examine the relationship of academic achievement of boys and girls with intelligence, socioeconomic status, size of the family and birth order of the child. From the six institutions of Lucknow city a sample of 300 secondary school students of class 9^{th} was selected. Further the Institutions were divided into three categories, i.e., poor, average, and good. Two institutions from each category were selected- one from boys and one from girls. Academic achievement (total marks obtained in final examination of class 8th), Prayag Mehta Intelligence Test, Socio-economic status scale by Kuppuswamy and a questionnaire for family size and birth order were administered for data collection. Pearson Product Moment Correlation and Critical Ratio (CR) were used for data analysis. It was found that significant positive relationship existed between academic achievement and intelligence for both the groups. There was significant negative relationship between academic achievement and family size of students. Significant negative relationship was also found between academic achievement and birth order of students.

Robert H. Vela, Jr. (2003) the purpose of the study was to investigate the role of emotional intelligence in the Academic Achievement of 1st year college students. The purpose of the study was to examine the role of emotional intelligence in the academic achievement of first year college students. The subject of the study included 760 first year college students from a selected university in South Texas. Each student completed a self-report emotional intelligence assessment. Descriptive statistics were used to examine the study. For this study Pearson's product-moment

correlation and multiple linear regression analysis statistical procedures were used to examine the relationship between emotional intelligence skills and the academic achievement of first year college students. SAT scores, gender, and ethnicity were also investigated as independent variables. The findings of the study showed that there is significant correlation between emotional intelligence skills and the academic achievement of first year college students. It also reveals that the significant relationship between emotional intelligence skills and academic achievement according to gender and ethnicity. Furthermore, the results showed that SAT scores, when coupled with emotional intelligence skills, can better predict academic achievement. Self-management skills were significantly related to academic achievement.

Nuthana (2007) the study focused on gender analysis of academic achievement among high school students. The study was carried out to make gender analysis of academic achievement among high school students on a sample of 600 students studying in 8th, 9th and 10th standards of which 325 boys and 275 girls. From two schools of rural and two of Dharwad city, Karnataka state the samples were selected randomly. In order to measure the study habits and self-concept of students, Patel's (1976) study habit inventory and self-concept scale of Singh & Singh (1988) were used. To collect the general information of students socio economic status scale developed by AICRP-CD (2002) was used and average of grades of two previous years was taken from school records as a measure of academic achievement. The data thus collected was subjected to mean, S.D, t-test and correlation. From the findings of the study the study revealed that majority of the students had good study habits and possessed high self-concept. Academic achievement was excellent among boys and girls. They did not differ on study habits, self-concept and academic achievement. It was revealed from the Class wise comparison of study habits and self-concept revealed that 8th standard students were better than 9th and 10th standards. There was significant association between study habits, self-concept, socio economic status and academic achievement among boys and girls. Study habits, self-concept and socio economic status were significantly related to academic achievement. It was found that rural students had better study habits and self-concept than urban students. Urban students had higher academic achievement than rural students.

Treena eileen rohde, lee anne thompson (2007) Conducted a study on predicting academic achievement with cognitive ability. The purpose of this study was to explain the variation in academic achievement with general cognitive ability and specific cognitive abilities. Grade point average, Wide Range Achievement Test III scores, and SAT scores represented academic achievement. The specific cognitive abilities of interest were: working memory, processing speed, and spatial ability. General cognitive ability was measured with Raven's Advanced Progressive Matrices and the Mill Hill Vocabulary Scales. When controlling for working memory, processing speed and spatial ability in a sample of 71 young adults (29 males) measures of general cognitive ability continued to add to the prediction of academic achievement, but none of the specific cognitive abilities accounted for additional variance in academic achievement after controlling for general cognitive ability. However, processing speed and spatial ability continued to account for a significant amount of additional variance when predicting scores for the mathematical portion of the SAT while holding general cognitive ability constant.

Sharmistha Roy (2008) a comparative study was conducted on adolescent boys and girls to study the factors affecting academic achievement. The purpose of the study was to determine the factors which effect on the academic achievement like daily routine of the students, tuitions, content viewed on television etc affecting the academic achievement of school going adolescent boys and girls. The factor group of the study consisted of top 10 rankers, both boys and girls from class 8th to 10th. Data was collected by the questionnaire method. Analysis was done by calculating frequency and percentage. Results showed that there is not much difference in the importance of many of the selected factors exhibited by boys and girls, which play an important role in their academic achievement.

Farhana Qadir (2010) a study was conducted on the scientific temper and academic achievement of rural and urban adolescent girls. The aim of the study was to compare the scientific temper of rural and urban adolescent girls on the various areas of scientific temper, to compare the academic achievement of rural and urban adolescent girls and to examine the relationship between scientific temper and academic achievement. For the study a sample consists of 200 girls were randomly selected from 10 higher secondary schools of district Srinagar and Pulwama. Among the 10 schools, 100 were selected from rural adolescent girls and 100 were selected

from the urban adolescent girls. Scales used for the present study which is constructed by Showkat and Prof. Nadeem which access five dimensions of scientific temper. The data was analyzed by applying Review of Related Literature Department of Education, University of Kashmir 19 t-test and correlation statistics. There was no significant difference found between rural and urban adolescent girls on curiosity dimension of scientific temper scale. Urban girls were found to have high academic achievement than rural girls and academic achievement have been found to be positively and significantly related with scientific temper

2.4 RESEARCH GAP

The topic chose should me such as it has not been investigated earlier. From a review of research and after conclusion whatever researches the investigator could come across through his sincere efforts did not find any study which has been done either in the country or abroad, on the present topic the topic being new and have not been investigated earlier, the researcher has received the attention for this topic. Hence the newness of the topic is also one of the reasons for the choice of the present study. The above review reveals that many scholars have studied the different factors which affect the academic achievement of the students. However a comprehensive yet concise research work focusing on those closely related academic achievement and learning style.

Chapter 3

METHODOLOGY AND PROCEDURE

The collection of data is an important aspect of the research whole process of, the research depends upon the data. There are many techniques of data gathering.

This chapter gives us an idea about the sample which has been regarded as the basis of research. In addition to this it also provides a picture of instrument employed for the collection of data. In explaining the methods and procedures in the study, the investigator describes the techniques used in the collection of data and method adopted in drawing out the sample and procedure employed for tabulating and organizing the data for research.

The order of discussion of these is as under:

1. Population for the study
2. Selection of the Sample.
3. Tools and their description.
4. Administration of the Tools.
5. Scoring Procedure.
6. Statistical techniques used

3.1 POPULATION FOR THE STUDY

Population may be defined as the group of individuals belonging to same species. For the present study all the schools of the Jammu district were included in the population of the study and from this only the secondary school students were taken.

3.2 SELECTION OF THE SAMPLE

A sample is a small proportion of a population selected for analysis. Sampling is a foundation of research. It is essential for all statistical studies. The investigator demands a sample which would truly reflect the whole population. This is the basic characteristic of good sampling. A good sample will produce result very much approaching the population and generalization will be effective .There are many techniques for obtaining a sample, which will be representative of the whole population

It is physically impossible to work with total population in any scientific research. Moreover the time, money and efforts involved do not allow a researcher to study all possible members of populations. Research therefore, is invariably conducted by means of a sample drawn from the accessible populations on the basis of which generalizations are arrived at a made applicable to the target populations as a whole.

In the present study a sample of 245, IXth class school students was selected from secondary schools of district Jammu by simple random sampling. For the selection of the sample the investigator prepared a list of all the secondary schools of Jammu district and from these schools the investigator selected 9 schools randomly. From these schools the investigator selected class ninth and from the class the investigator selected 245 students randomly.

TABLE 3.1: Showing the Details of Sample Selected From Different Schools of Jammu City

S.NO.	NAME OF THE SCHOOL	BOYS	GIRLS	TOTAL
01	Government Girls HSS, Mubarak Mandi	--	26	26
02	Government High School, Bathendi	16	1	17
03	Government SRMLHSS, Parade (boys)	59	--	59
04	Government Girls HSS, Satwari	--	22	22
05	Government High School, Qasim Nagar	13	15	28
06	Government Girls HSS, Canal Road	--	41	41
07	Government Girls HSS, City Chowk	8	6	14
08	Government Central Basic HSS, Purani Mundi	13	--	13
09	Government HSS, Sunjwan	10	15	25
	TOTAL	119	126	245

3.3 VARIABLES STUDIED

The variable which has been studied in the study is as under:

1. Learning style
2. Academic Achievement

3.4 SELECTION OF THE TOOL

In every type of research the investigator needs certain instruments to gather certain facts and explore new fields .The instrument thus employed are called tools. Different tools are suitable for collecting various kinds of information for various purposes..

In the present study instrument employed for the collection of data is:

3.4.1 Learning Style Tool By K. S. Misra Published By National Psychological Corporation Agra

The investigator employed learning style inventory developed by K.S. Misra. It consists of 42 items which are having five responses from 1st, 2nd, 3rd, 4th, 5^{th} which were scored in reverse order as 5, 4, 3, 2, 1. The scores were added in an orderly manner as per the different learning styles of the students.

3.5 RELIABILITY

The three styles of learning having values of alpha reliability as for verbal style the value is .903 ,for figural style of learning the value is .742 and for enactive style of learning the value is .682. However the value of N is 150.

3.6 VALIDITY

The intrinsic validity was found by product moment method of correlation for the learning styles. The table Z depicts that enactive style of learning is positively correlated to the verbal and the figural styles of learning and positive correlation is found between the verbal and the figural styles of learning. It was found that positive correlation is found between all the styles of learning. The value of N is 100.

3.7 OTHER SOURCES OF DATA

The investigator collected the academic achievement scores of the secondary school students from the result register of the concerned schools. The investigator collected the total marks and the marks obtained by the students and from this academic achievement of the students were seen by the investigator.

3.8 DESCRIPTION OF TOOL FOR THE LEARNING STYLE

In the present study the investigator used the tool constructed by K.S. Misra for the learning styles. Through this tool six styles of learning can be measured which are discussed as under

- Enactive Reproducing style of learning
- Enactive constructive style of learning
- Figural Reproducing style of learning
- Figural Constructive style of learning
- Verbal Reproducing style of learning
- Verbal Constructive style of learning

The first and the second type can be grouped together to form the enactive style of learning; 3rd and 4th can be clubbed together to make the figural style of learning and 5th and 6th can be joined together to make the verbal style of learning while as the combination of 1st , 3rd and 5th forms the reproducing type of learning style and grouping together the 2nd , 4th and 6th makes the constructive style of learning.

The three styles of learning having values of alpha reliability as for verbal style the value is .903, for figural style of learning the value is .742 and for enactive style of learning the value is .682. However the value of N is 150.

The intrinsic validity was found by product moment method of correlation for the learning styles. The table Z depicts that enactive style of learning is positively correlated to the verbal and the figural styles of learning and positive correlation is found between the verbal and the figural styles of learning. It was found that positive correlation is found between all the styles of learning. The value of N is 100.

Table. No: 3.2 showing the values of correlation for different styles of learning measured through the tool of learning style by K . S. Misra (N=200)

	ER	EC	FR	FC	VR	VC	E	F	V	R
EC	.132									
FR	.371	.417								
FC	.227	.539	.486							
VR	.280	.431	.495	.372						
VC	.207	.310	.209	.271	.528					
E	.684	.813	.525	.530	.481	.350				
F	.345	.556	.855	.869	.444	.279	.612			
V	.281	.427	.351	.371	.889	.859	.479	.419		
R	.685	.451	.801	.492	.766	.427	.734	.745	.693	
C	.246	.816	.494	.812	.573	.660	.745	.762	.702	.598

3.9 ADMINISTRATION OF THE TOOL

The investigator visited the government secondary schools of jammu district selected through the simple random sampling. The researcher discussed the need of his study with the concerned principals for giving permission for the collection of data. Once the permission was given the investigator developed rapport by giving them directions for answering the questionnaire very carefully.

3.10 SCORING OF THE TOOL

The scoring of the questionnaire is done as per the instructions and procedure given in the manual.

3.10.1 SCORING OF THE LEARNING STYLE TOOL

The scoring of the questionnaire is done as per the instructions and procedure given in the manual. In each question of the questionnaire there are five response alternatives. These are very less, less, normal, much, and very much. The scoring of the responses is done by awarding the marks as 1, 2, 3, 4, and 5 respectively. Enactive style of learning is formed by the combination of scores of enactive reproducing and enactive constructive styles of learning. Figural style of learning is formed by the combination of scores of figural reproducing and figural constructive styles of learning. Verbal style of learning is formed by combination of score of verbal reproducing and verbal constructive styles of learning. Reproducing style of learning is formed by the addition of the score of ER, VR and FR styles of learning. Constructive style of learning is formed by the addition of the scores of EC, VC and FC styles of learning. The maximum score for this questionnaire is 210 and the minimum score for this questionnaire is 41.

3.11 STATISTICAL TECHNIQUES USED:

Regression

Chapter 4

ANALYSIS AND INTERPRETATION OF DATA

The scored data has no meaning unless it is analyzed and interpreted by suitable scientific methods. Analysis of data means studying the material in order to determine inherent fact. It involves the breaking up of the complex factors into simple parts and putting them in new arrangements for the purpose of interpretations.

For every researcher, it is crucially important to know that not only precision in the collection of data or selection of tools can guarantee the accomplishment of objectives, but adequate knowledge in the application of statistical analysis is equally important. Data analysis is the act of transforming data with the aim of extracting useful information and facilitating conclusion. Data analysis is the process of systematically applying statistical and or logical techniques to describe and illustrate, condense, recap and evaluate data.

In the present endeavor, the investigator has made an attempt to analyze and interpret the data of the present study by using different statistical techniques.

4.1: REGRESSION

Regression analysis in general sense means the estimation or prediction of the unknown value of one variable from the known value of the other value. Regression analysis is a mathematical measure of average relationship between two or more variables in terms of original units of data. Regression analyses there are two types of variables. The variable whose value is influenced or is to be predicted is called dependent variable and the variable which influences the values are is used for prediction is called independent variable. In regression analysis independent variable is also known as regresor or predictor or explanatory while the dependent variable is also known as regressed or explained variable. When the regression analysis is confined to the study of only two variables at a time it is known as simple regression. But quite often the values of the particular phenomenon may be affected by a multiplicity of factors. The regression analysis for studying more than two variables at a time is known as multiple regression.

$Y=\alpha+\beta X+\mu$(error term)

Where,

Y = Dependent variable

X= Explanatory variable/Independent variable

α = Constant term

β = Coefficient term/ slope of the equation

Hypothesis No:1 There will be no significant impact of learning style on the academic achievement of the secondary school students.

Table No.4.1: The below table showing the modal summary for hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school students.

Table No.: 4.1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834	.696	.695	15.514

Predictors: (Constant), total

The table 4.1 it can be interpreted that the value of r is .834which shows that there is very high correlation between the learning style and the academic achievement of secondary school students. The value of r square is 69 which shows that 69 percent variation in academic achievement is explained by learning style.

Table No.4.2: ANNOVA Summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school students.

Table No.: 4.2: ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance
1	Regression	133841.282	1	133841.282	556.122	Significant at .05 level
	Residual	58482.538	243	240.669		
	Total	192323.820	244			

a. Predictors: (Constant), total score

b. Dependent Variable: academic achievement

The above table 4.2 depicts that the calculated value of f is 556.122 which is greater than the table value at 0.05 level of significance which means that the learning style

has impact on the academic achievement of secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school students is refuted.

Table No.: 4.3: Coefficients Summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school students.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance.
		B	Std. Error	Beta		
1	(Constant)	191.247	8.102		23.606	.000
	Total score	1.220	.052	.834	23.582	.000

Dependent Variable: academic achievement

From the table 4.3 it can be interpreted that the value of p is significant which means that the value less than 0.05 which shows that there is a significant impact of learning style on the academic achievement of secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school students is rejected.

Hypothesis No.:2 There will no significant impact of learning style on the academic achievement of the secondary students with reference to their.

2.1. Enactive reproducing learning style.

2.2. Enactive Constructive learning style.

2.3. Figural reproducing learning style.

2.4. Figural Constructive learning style.

2.5. Verbal reproducing learning style.

2.6. Verbal Constructive learning style**.**

Table 4.4: Model summary of hypothesis there is no significant impact of learning style on the academic achievement of secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No.:4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.841	.707	.700	15.374

a. Predictors: (Constant), enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive

From the table 4.4 it can be stated that the value of r is .841which shows that there is high correlation between the learning style and the academic achievement of secondary school students. The value of r square is .70 which shows that 70 percent variation in academic achievement is explained by learning style.

Table No.4.5: **ANNOVA summary of hypothesis there will be no significant impact of learning style on the academic achievement of secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.**

Table No. :4.5: ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	136067.323	6	22677.887	95.942	Significant at 0.05 level
	Residual	56256.497	238	236.372		
	Total	192323.820	244			

a. Predictors: (Constant) enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive

b. Dependent Variable: academic achievement

The above table 4.5 shows the calculated value of f is 95.942 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of secondary school students. Hence the

hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school students with reference to ER, EC, FR, FC, VR, VC learning styles is refuted

Table: 4.6: Coefficients summary of **hypothesis there will be no significant impact of learning style on the academic achievement of secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.**

Table: 4.6: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	192.870	8.223		23.456	.000
	ER	.741	.337	.106	2.202	.029
	EC	1.568	.334	.239	4.696	.000
	FR	.984	.283	.163	3.475	.001
	FC	1.471	.316	.230	4.659	.000
	VR	1.738	.322	.254	5.403	.000
	VC	.763	.335	.108	2.276	.024

a. Dependent Variable: academic achievement

From the above table 4.6 it can be inferred that the calculated value of p of various learning styles viz ER, EC, FR, FC, VR, VC is .000, .029, .000, .001, .000, .000, .024 which is less than the value of .05 which reveals that there is a significant impact of these learning styles on the academic achievement of secondary school students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles is refuted.

Hypothesis: 3 There will no significant impact of learning style on the academic achievement of the secondary school students with reference to their:

3.1. Enactive learning style

3.2. Figural learning style

3.3. Verbal learning style

3.4 Reproducing learning style

3.5 Constructive learning style

Table: 4.7: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table: 4.7 :Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.833	.693	.687	15.711

a. Predictors: (Constant), constructive, reproducing, verbal, enactive and figural

The table 4.7 shows that the value of r is .833 which means that there is very high correlation between the learning style and the academic achievement of secondary school male students The value of r square is .69 which shows that 69 percent variation in academic achievement is explained by learning style.

Table: 4.8: ANOVA summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table : 4.8: ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	133326.604	5	26665.321	108.022	.000
	Residual	58997.217	239	246.850		
	Total	192323.820	244			

Predictors: (Constant), constructive, reproducing, verbal, enactive, figural

The above table 4.8 shows that the calculated value of f is 108.022 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of secondary school male students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school students with reference to enactive, figural, verbal, reproducing and constructive learning styles is refuted.

Table No.:4.9: The below given table displays the summary of Coefficients for the hypothesis that there will be no significant impact of learning style on the academic achievement of the secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table No.: 4.9: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance.
		B	Std. Error	Beta		
1	(Constant)	192.458	8.376		22.976	.000
	Enactive	.764	.336	.107	2.404	.023
	Figural	.985	.390	.163	3.484	.001
	Verbal	.741	.366	.106	2.202	.029
	Reproducing	1.012	.358	.387	2.829	.005
	Constructive	1.156	.346	.443	3.340	.001

a. Dependent Variable: Academic achievement

From the table 4.9 it can be inferred that the calculated value of p of various learning styles viz enactive, figural, verbal, reproducing and constructive is .023, .001, .029, .005, .001 is less than the value of .05 which shows the impact of these learning styles is on the academic achievement of secondary school male students . Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of secondary school male students with reference to enactive, figural, verbal, reproducing and constructive learning styles is refuted.

Hypothesis: 4 There will be no significant impact of learning style on the academic achievement of the secondary school male students

Table No: 4.10: Model summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school male students

Table No.: 4.10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.845	.714	.711	14.13933

a. Predictors: (Constant), total

From the above table 4.10 it can be interpreted that the value of r is .845 which shows that there is very high correlation between the learning style and the academic achievement of secondary school male students. The value of r square is .71 which shows that 71 percent variation in academic achievement is explained by learning style.

Table No: 4.11: ANNOVA summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school male students

Table: 4.11:ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	58255.728	1	58255.728	291.394	Significant at 0.05
	Residual	23390.709	117	199.921		
	Total	81646.437	118			

a. Predictors: (Constant), total

b. Dependent Variable: academic achievement

From the above table 4.11 calculated value of f is 291.394 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school male students is refuted.

Table No: 4.12: Coefficients summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school male students

Table No. 4.12:Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance
		B	Std. Error	Beta		
1	Constant	212.733	9.571		22.227	.000
	total1	1.083	.063	.845	17.070	.000

a. Dependent Variable: academic achievement

From the table 4.12 it can be interpreted that the value of p is significant which means that the value is less than .05 which reveals that there is a significant impact of learning style on the academic achievement of secondary school male students. Therefore the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school male students is refuted.

Hypothesis: 5 There will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their.

H 5.1.Enactive reproducing learning style.

H5.2. Enactive Constructive learning style.

H5.3. Figural reproducing learning style.

H5.4. Figural Constructive learning style.

H5.5. Verbal reproducing learning style.

H5.6. Verbal Constructive learning style.

Table No.:4.13: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No.: 4.13:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.857	.734	.719	13.93290

a. Predictors: (Constant), enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive

From the table 4.13 it can be interpreted that the value of r is .857 which shows that there is a very high correlation between the learning styles such as ER, EC, FR, FC, VR, VC and the academic achievement of secondary school male students. The value of r square is .73 which shows that 73 percent variation in academic achievement is explained by learning style.

Table No.:4.14: ANNOVA summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table NO.: 4.14 :ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	59904.344	6	9984.057	51.431	.000
	Residual	21742.093	112	194.126		
	Total	81646.437	118			

a. Predictors: (Constant), enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive

b. Dependent Variable: Academic Achievement

The above table 4.14 shows the calculated value of f is 51.43 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school male students with reference to ER, EC, FR, FC, VR, VC learning styles is refuted.

Table No.:4.15: Coefficients summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No. : 4.15:Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	210.058	9.693		21.672	.000
	ER	1.165	.448	.177	2.603	.010
	EC	.924	.422	.164	2.187	.031
	FR	1.363	.358	.240	3.808	.000
	FC	1.212	.456	.197	2.656	.009
	VR	.925	.394	.164	2.189	.031
	VC	1.343	.432	.210	3.111	.002

a. Dependent Variable: academic achievement

From the table 4.15 it can be inferred that the calculated value of p of various learning styles viz ER, EC , FR, FC, VR, VC is .010, .031, .000, .009, .031, .002 are significant which means that there is a significant impact of these learning styles on the academic achievement of secondary school male students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of secondary school male students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles is refuted.

Hypothesis: 6 There will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their

H6.1. Enactive learning style

H6.2. Figural learning style

H6.3. Verbal learning style

H6.4 Reproducing learning style

H6.5 Constructive learning style

Table No.:4.16 Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their enactive, figural, verbal, reproducing and constructive learning styles

Table No.: 4.16:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.847	.717	.705	14.29088

a. Predictors: (Constant) enactive, figural, verbal, reproducing and constructive

From the above table 4.16 it can be interpreted that the value of r is .847 which shows that there is very high correlation between the learning style and the academic achievement of secondary school male students. The value of r square is .71 which shows that 71 percent variation in academic achievement is explained by learning style.

Table No.:4.17 ANNOVA summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their enactive, figural, verbal, reproducing and constructive learning styles

Table No.: 4.17: ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	58568.544	5	11713.709	57.356	.000
	Residual	23077.893	113	204.229		
	Total	81646.437	118			

a. Predictors: (Constant), constructive, reproducing, verbal, enactive, figural

b. Dependent Variable: academic achievement

The above table 4.17 shows the calculated value of f is 57.35 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of secondary school male students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school male students with reference to Enactive, Figural, verbal, Reproducing Constructive, learning style is refuted.

Table No.:4.18: Coefficients summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their enactive, figural, verbal, reproducing and constructive learning styles

Table No.: 4.18:Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	216.936	9.819		22.093	.000
	Enactive	1.471	.469	.231	4.659	.000
	Figural	.984	.474	.163	3.475	.001
	Verbal	1.738	.403	.254	5.403	.000
	Reproducing	.976	.404	.404	2.417	.017
	Constructive	.944	.401	.408	2.352	.020

a. Dependent Variable: academic achievement

From the table 4.18 it can be inferred that the calculated value of p of various learning styles viz enactive, figural, verbal, reproducing and constructive is .000, .001, .000, .017, .020 which is less than the value of .05 which reveals that there is a significant impact of these learning styles on the academic achievement of secondary school male students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of secondary school male students with reference to enactive, figural, verbal, reproducing and constructive learning styles is refuted.

Hypothesis:7 There will be no significant impact of learning style on the academic achievement of the secondary school female students

Table No.:4.19: Model Summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school female students

Table No.:4.19: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.790	.624	.621	18.35072

From the above table 4.19 it can be interpreted that the value of r is .790 which shows that there is very high correlation between the learning style and the academic achievement of secondary school female students. The value of r square is .62 which shows that 62 percent variation in academic achievement is explained by learning style.

Table No.:4.20: ANNOVA Summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school female student

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	69403.846	1	69403.846	206.100	.000
	Residual	41756.860	124	336.749		
	Total	111160.706	125			

The above table 4.20 shows the calculated value of f is 206.10 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of secondary school female students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school female students is refuted

Table No.:4.21: Coefficients Summary of hypothesis there will be no significant impact of learning style on the academic achievement of the secondary school female students

Table No.:4. 21: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance
		B	Std. Error	Beta		
1	(Constant)	151.051	16.557		9.123	.000
	Total	1.469	.102	.790	14.356	.000

From the table 4.21 it can be inferred that the calculated value of p is.00 which is less than the table value at .05 which reveals that there is a significant impact of the learning style on the academic achievement of secondary school female students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school female students is refuted.

Hypothesis: 8 There will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their.

H8.1. Enactive reproducing learning style.

H 8.2.EnactiveConstructive learning style.

H8.3. Figural reproducing learning style.

H8.4. Figural Constructive learning style.

H8.5.Verbal reproducing learning style.

H8.6. Verbal Constructive learning style

Table No.4.22: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their enactive reproducing, enactive constructive , figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No.: 4.22:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.810	.656	.639	17.92394

a. Predictors: (Constant), enactive constructive, enactive reproducing, verbal constructive, verbal reproducing, figural constructive, figural reproducing

From the table 4.22 it can be interpreted that the value of r is .810 which shows that there is very high correlation between the learning styles such as ER, EC, FR,FC,VR,VC and the academic achievement of secondary school female students. The value of r square is .65 which shows that 65 percent variation in academic achievement is explained by learning style.

Table No.4.23: ANNOVA summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning style.

Table No.:4.23:ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance
1	Regression	72929.879	6	12154.980	37.834	Significant at 0.05 level
	Residual	38230.827	119	321.267		
	Total	111160.706	125			

a. Predictors: (Constant), enactive constructive, enactive reproducing, verbal constructive, verbal reproducing, figural constructive, figural reproducing

b. Dependent Variable: academic achievement

The above table 4.23 shows the calculated value of f is 37.83 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school female students with reference to ER, EC, FR, FC, VR,VC learning styles is refuted.

Table No.4.24: Coefficients summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles

Table No.4.24: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	(Constant)	153.114	17.089		8.960	.000
	ER	.978	.566	.171	3.117	.002
	EC	2.531	.619	.284	4.092	.000
	FR	1.238	.498	.198	3.978	.000
	FC	2.002	.494	.291	4.055	.000
	VR	2.841	.580	.347	4.895	.000
	VC	1.154	.584	.176	3.431	.001

a. Dependent Variable: academic achievement

From the above table 4.24 it can be interpreted that the calculated value of p of various learning styles viz ER,EC,FR,FC,VR,VC is .000, .002, .000, .000, .000, .001

which is less than 0.05 which reveals that there is a significant impact of these learning styles on the academic achievement of female secondary school students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of secondary school female students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles is refuted.

Hypothesis: 9 There will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their

H9.1. Enactive learning style

H9.2. Figural learning style

H9.3. Verbal learning style

H9.4 Reproducing learning style

H9.5 Constructive learning style

Table No.:4.25: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table No.: 4.25: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.795	.632	.617	18.46387

a. Predictors: (Constant), constructive, reproducing, verbal, enactive, figural

The table 4.25 it can be interpreted that the value of r is .795 which shows that there is very high correlation between the learning styles such as enactive, figural, verbal, reproducing, constructive and the academic achievement of secondary school students. The value of r square is .63 which shows that 63 percent variation in academic achievement is explained by learning style.

Table No.:4.26: ANNOVA summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table No.: 4.26: ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	70250.945	5	14050.189	41.213	Significant at 0.05 level
	Residual	40909.761	120	340.915		
	Total	111160.706	125			

a. Predictors: (Constant), constructive, reproducing, verbal, enactive, figural

b. Dependent Variable: academic achievement

The above table 4.26 calculated value of f is 41.213 which is greater than the table value at 0.05 level of significance which means that the learning style viz enactive, figural, verbal, reproducing and constructive learning styles has impact on the academic achievement of secondary school female students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of secondary school female students with reference to enactive, figural, verbal, reproducing, constructive learning styles is refuted.

Table No.:4.27: Coefficients summary of hypothesis there will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table No.: 4.27:Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance.
		B	Std. Error	Beta		
1	(Constant)	143.197	18.039		7.938	.000
	Enactive	1.174	.772	.180	3.679	.000
	Figural	.977	.796	.173	3.108	.002
	Verbal	1.739	.801	.254	5.403	.000
	Reproducing	.783	.767	.108	2.416	.023
	Constructive	1.800	.758	.545	2.374	.019

a. Dependent Variable: academic achievement

From the table 4.27 it can be inferred that the calculated value of p of various learning styles viz. enactive, figural, verbal, reproducing, and constructive is .000, .002, .000, .023, .019.These values are less than .05 level of which reveals that there is a significant impact of these learning styles on the academic achievement of female secondary school students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of secondary school female students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles is refuted.

Hypothesis: 10 There will be no significant impact of learning style on the academic achievement of the rural secondary school students

Table No.:4.28: Model summary of hypothesis there will be no significant impact of learning style on the academic achievement of the rural secondary school students

Table No.: 4.28:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.913	.834	.833	10.719

a. Predictors: (Constant), total

The table 4.28 it can be interpreted that the value of r is .913 which shows that there is very high correlation between the learning style and the academic achievement of rural secondary school students. The value of r square is .83 which shows that 83 percent variation in academic achievement is explained by learning style.

Table No.:4.29: ANNOVA summary of hypothesis there will be no significant impact of learning style on the academic achievement of the rural secondary school students

Table No.:4.29: ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance
1	Regression	68859.297	1	68859.297	599.322	Significant at .05 level
	Residual	13672.537	119	114.895		
	Total	82531.835	120			

a. Predictors: (Constant), total

b. Dependent Variable: academic achievement

The above table 4.29 shows the calculated value of f is 599.322 which is greater than the table value at 0.05 level of significance which means that the learning style has impact on the academic achievement of rural secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of rural secondary school students is refuted.

Table No.:4.30: Coefficients summary of hypothesis there will be no significant impact of learning style on the academic achievement of the rural secondary school students

Table No.: 4.30:Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	(Constant)	200.193	7.579		26.412	.000
	Total	1.174	.048	.913	24.481	.000

a. Dependent Variable: academic achievement

From the table 4.10.3 it can be inferred that the calculated value of p is less than .05 which reveals that there is a significant impact of learning style on the academic achievement of rural secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of rural secondary school students is refuted.

Hypothesis No.:11There will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their.

H11.1. Enactive reproducing learning style.

H11.2. Enactive Constructive learning style.

H11.3. Figural reproducing learning style.

H11.4. Figural Constructive learning style.

H11.5.Verbal reproducing learning style.

H11.6. Verbal Constructive learning style.

Table No.4.31: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No.:4.31:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.922	.851	.843	10.392

a. Predictors: (Constant), enactive constructive, enactive reproducing, verbal constructive, verbal reproducing, figural constructive, figural reproducing

From the table 4.31 it can be interpreted that the value of r is .922 which shows that there is very high correlation between the learning styles viz ER, EC, FR, FC, VR, VC and the academic achievement of rural secondary school students. The value of r square is .85 which shows that 85 percent variation in academic achievement is explained by learning style.

Table No.4.32: ANNOVA summary of hypothesis there will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles

Table No.:4.32:ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	70221.159	6	11703.526	108.378	.000
	Residual	12310.676	114	107.988		
	Total	82531.835	120			

a. Predictors: (Constant), enactive constructive, enactive reproducing, verbal constructive, verbal reproducing, figural constructive, figural reproducing

a. dependent Variable: academic achievement

The above table 4.32 shows the calculated value of f is 108.378 which is greater than the table value at 0.05 level of significance which means that the learning styles such as ER, EC, FR, FC, VR, VC has impact on the academic achievement of rural secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of rural secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing ,figural constructive, verbal reproducing and verbal constructive learning styles is refuted.

Table No.:4.33: Coefficients summary of hypothesis there will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles

Table No. :4.33: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance.
		B	Std. Error	Beta		
1	(Constant)	199.169	7.595		26.223	.000
	ER	1.155	.326	.177	3.543	.001
	CR	1.560	.340	.262	4.590	.000
	FR	1.011	.316	.170	3.195	.002
	FC	.975	.314	.173	3.107	.002
	VR	1.227	.308	.197	3.979	.000
	VC	1.175	.319	.180	3.679	.000

a. Dependent Variable: academic achievement

From the table 4.33 it can be interpreted that the calculated value of p of various learning styles viz ER, EC, FR, FC,VR, VC is .001, .00, .002, .002, .00, .00 which is less than the value of .05 which reveals that there is a significant impact of these learning styles on the academic achievement of rural secondary school students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of rural secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles is refuted.

Hypothesis: 12 There will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their

H12.1. Enactive learning style

H12.2. Figural learning style

H12.3. Verbal learning style

H12.4 Reproducing learning style

H12.5 Constructive learning style

Table No.:4.34: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles

Table No.: 4.34:Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.917	.842	.835	10.659

a. Predictors: (Constant), constructive, reproducing, verbal, enactive, figural

From the table 4.34 it can be interpreted that the value of r is .917 which shows that there is very high correlation between the learning styles viz. enactive, figural, verbal, reproducing and constructive on the academic achievement of rural secondary school students. The value of r square is .84 which shows that 84 percent variation in academic achievement is explained by these learning styles.

Table No.:4.35: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles

Table No.: 4.35:ANNOVA

Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Significance**
1	Regression	69466.617	5	13893.323	122.289	Significant at 0.05 level
	Residual	13065.218	115	113.611		
	Total	82531.835	120			

a. Predictors: (Constant), constructive, reproducing, verbal, enactive, figural

b. Dependent Variable: academic achievement

The above table 4.35 shows that the calculated value of f is 122.289 which is greater than the table value at 0.05 level of significance which means that these learning style viz enactive, figural, verbal, reproducing and constructive has impact on the academic achievement of secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of rural secondary school students with reference to enactive, figural, verbal, reproducing and constructive learning styles is refuted.

Table No.:4.36: Coefficients summary of hypothesis there will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles

Table No.: 4.36:Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance.
		B	Std. Error	Beta		
1	(Constant)	202.204	7.732		26.153	.000
	Enactive	1.153	.337	.176	3.553	.001
	Figural	1.734	.362	.255	5.403	.000
	Verbal	1.011	.290	.170	3.195	.002
	Reproducing	1.142	.291	.470	3.929	.000
	Constructive	1.079	.306	.464	3.526	.001

a. Dependent Variable: academic achievement

From the table 4.36 it can be stated that the calculated value of p of various learning styles viz enactive, figural, verbal, reproducing and constructive is .001, .000, .002, .000, .001. .However these values are significant which means that the values are less than 0.05 which reveals that there is a significant impact of these learning styles on the academic achievement of rural secondary school students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement with reference to enactive, figural, verbal, reproducing and constructive on the academic achievement of rural secondary school students is refuted.

Hypothesis: 13 There will be no significant impact of learning style on the academic achievement of the urban secondary school students

Table No.:4.37: Model summary of hypothesis there will be no significant impact of learning style on the academic achievement of the urban secondary school students

Table No.:4.37: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739	.546	.542	21.011

a. Predictors: (Constant), total

The table 4.13.1 it can be interpreted that the value of r is .739 which shows that there is very high correlation between the learning styles on the academic achievement of urban secondary school students. The value of r square is .54 which shows that 54 percent variation in academic achievement is explained by these learning styles.

Table No. : 4.38: ANNOVA summary of hypothesis there will be no significant impact of learning style on the academic achievement of the urban secondary school students

Table No.: 4.38: ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	64668.348	1	64668.348	146.488	.000
	Residual	53857.845	122	441.458		
	Total	118526.194	123			

a. Predictors: (Constant), total

b. Dependent Variable: academic achievement

The above table 4.38 shows that the calculated value of f is 146.488 which is greater than the table value at 0.01 level of significance which means that these learning style has impact on the academic achievement of urban secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of urban secondary school students is refuted.

Table No.: 4.39: Coefficients summary of hypothesis there will be no significant impact of learning style on the academic achievement of the urban secondary school students

Table No.:4.39: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	181.161	16.407		11.042	.000
	Total	1.280	.106	.739	12.103	.000

a. Dependent Variable: academic achievement

From the above table 4.39 it can be interpreted that the calculated value of p of is less than .05 which reveals that there is a significant impact of learning style on the academic achievement of urban secondary school students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of urban secondary school students is refuted.

Hypothesis No.:14 There will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their.

H14.1. Enactive reproducing learning style.

H14.2. Enactive Constructive learning style.

H4.3. Figural reproducing learning style.

H14.4. Figural Constructive learning style.

H14.5.Verbal reproducing learning style.

H14.6. Verbal Constructive learning style.

Table No.:4.40: Model Summary of hypothesis there will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No.: 4.40:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.752	.565	.543	20.989

a. Predictors: (Constant), enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive

From the above table 4.40 it can be interpreted that the value of r is .752 which shows that there is very high correlation between learning styles viz ER, EC, VR, VC, FR, FC learning styles on the academic achievement of urban secondary school students. The value of r square is .56 which shows that 56 percent variation in academic achievement is explained by these learning styles.

Table No.:4.41: ANNOVA Summary of hypothesis there will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No.:4.41:ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Significance.
1	Regression	66981.857	6	11163.643	25.340	Significant at 0.05 level
	Residual	51544.337	117	440.550		
	Total	118526.194	123			

a. Predictors: (Constant), enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive

b. Dependent Variable: academic achievement

The above table 4.41 shows the calculated value of f is 25.340 which is greater than the table value at 0.05 level of significance which means that the learning style ER, EC, FR,FC, VR, VC has impact on the academic achievement of urban secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of urban secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing ,figural constructive, verbal reproducing and verbal constructive learning styles is refuted.

Table No.:4.42:Coefficents Summary of hypothesis there will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning styles.

Table No.:4.42:Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	183.567	16.678		11.006	.000
	ER	.334	.678	.234	.4.697	.000
	EC	1.527	.650	.204	2.349	.020
	FR	1.202	.504	.183	2.385	.019
	FC	2.017	.602	.267	3.349	.001
	VR	1.969	.635	.255	3.099	.002
	VC	1.174	.680	.180	3.679	.000

a. Dependent Variable: academic achievement

From the table 4.42 it can be interpreted that the calculated value of p of various learning styles viz ER, EC, FR, FC, VR, VC is .000, .020, .019, .001, .002, .000. which is less than the value of .05 which shows that these learning style has impact on the academic achievement of urban secondary school students. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement of urban secondary school students with reference to enactive reproducing, enactive constructive, figural reproducing, figural constructive, verbal reproducing and verbal constructive learning style is refuted.

Hypothesis:15 There will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their

H15.1. Enactive learning style

H15.2. Figural learning style

H15.3. Verbal learning style

H15.4 Reproducing learning style

H15.5 Constructive learning style

Table No.:4.43: Model summary of hypothesis there will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table No.:4.43:Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.746	.557	.538	21.106

a. Predictors: (Constant), enactive, figural, verbal, reproducing and constructive

The table 4.43 it can be interpreted that the value of r is .74 which shows that there is very high correlation between the learning styles viz enactive, figural, verbal ,reproducing and constructive on the academic achievement of urban secondary school students. The value of r square is .55 which shows that 55 percent variation in academic achievement is explained by these learning styles.

Table No.:4.44: ANNOVA summary of hypothesis there will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table No.: 4.44:ANNOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	65961.575	5	13192.315	29.615	.000
	Residual	52564.619	118	445.463		
	Total	118526.194	123			

a. Predictors: (Constant), enactive, figural, verbal, reproducing and constructive

b. Dependent Variable: academic achievement

The above table 4.44 shows the calculated value of f is 29.615 which is greater than the table value at 0.05 level of significance which means that these learning style has impact on the academic achievement of urban secondary school students. Hence the hypothesis stating that there will be no significant impact of learning style on the academic achievement of urban secondary school students with reference to enactive, figural, verbal, reproducing and constructive learning styles is refuted.

Table No.:4.45: Coefficients summary of hypothesis there will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their enactive, figural, verbal, reproducing and constructive learning styles.

Table No.: 4.45: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Significance
		B	Std. Error	Beta		
1	(Constant)	182.068	16.739		10.877	.000
	Enactive	1.567	.947	.239	4.441	.000
	Figural	1.471	.944	.232	4.658	.000
	Verbal	1.554	.328	.173	3.544	.001
	Reproducing	.742	.965	.106	2.202	.029
	Constructive	.762	.883	.108	2.276	.024

a. Dependent Variable: academic achievement

From the table 4.45 it can be inferred that the calculated value of p of various learning styles viz enactive, figural, verbal, reproducing and constructive the value is .000, .000, .001, .029, .024.All these values are significant which means that they are less than the value of .05 which means that there is a significant impact of these learning styles on the academic achievement of urban secondary school students.. Hence the hypothesis stating that there will be no significant impact of learning styles on the academic achievement with reference to enactive, figural, verbal, reproducing and constructive on the academic achievement of urban secondary school students is refuted.

Chapter 5

Main Findings, Educational implications and suggestions

A. Main Findings:

The main findings of the present study are as under

1. There is significant impact of learning style on the academic achievement of secondary school students.
2. There is significant impact of learning style on the academic achievement of secondary school students with reference to ER, EC, FR, FC, VR, VC learning styles.
3. There is significant impact of learning style on the academic achievement of secondary school students with reference to enactive, figural, verbal, reproducing and constructive learning styles.
4. There is significant impact of learning style on the academic achievement of secondary school male students.
5. There is significant impact of learning style on the academic achievement of secondary school male students with reference to ER, EC, FR, FC, VR, VC learning styles.
6. There is significant impact of learning style on the academic achievement of secondary school male students with reference to enactive , figural, verbal, reproducing and constructive learning styles.
7. There is significant impact of learning style on the academic achievement of secondary school female students.
8. There is significant impact of learning style on the academic achievement of secondary school female students with reference to ER, EC, FR, FC, VR, VC learning styles.
9. There is significant impact of learning style on the academic achievement of secondary school female students with reference to enactive , figural, verbal, reproducing and constructive learning styles.
10. There is significant impact of learning style on the academic achievement of secondary school rural students.
11. There is significant impact of learning style on the academic achievement of secondary school rural students with reference to ER, EC, FR, FC, VR, VC learning styles.

12. There is significant impact of learning style on the academic achievement of secondary school rural students with reference to enactive , figural, verbal, reproducing and constructive learning styles.
13. There is significant impact of learning style on the academic achievement of secondary school urban students.
14. There is significant impact of learning style on the academic achievement of secondary school urban students with reference to ER, EC, FR, FC, VR, VC learning styles.
15. There is significant impact of learning style on the academic achievement of secondary school urban students with reference to enactive, figural, verbal, reproducing and constructive learning styles.

B. EDUCATIONAL IMPLICATIONS

Planning which plays a vital role in every field today is affecting the work of educational planners and policy makers also. The incorporation of opportunities and experiences which may develop the learning styles of children can be taken into consideration while designing the framework of curricular and co-curricular activities.

Curriculum forms the base in every field of education. Curriculum includes all the activities inside and outside the school which the child has to play. It means that it is the runaway or the path which the child has to follow. The curriculum framers should include such activities and experiences in the curriculum which can best fit the learning styles of the students

Books are the main agencies through which the students learn mostly in their academic field. It is the duty of the text book writers that while writing the text books the authors should write such topics and lessons in the text books by which the different types of learning styles of the students can be uplifted.

The teacher should organise the classroom activities in such a way that the students get equal opportunity for participation. Such practices should be encouraged that would help in boosting the learning style of students. The teacher should make use of various types teaching aids in the classroom . Interest oriented activities for enhancing students learning should be the focus of teachers which should suite the learning style of every student.

The parents should provide proper freedom and conductive environment for the expression of the thoughts and feelings of their wards; so that the experience of fearlessness gets reflected in their personalities in terms of high self-concept and the children to learn by the style which fits him best and will be able to express himself fully without any hesitation and that in turn will result in the development of balanced personality.

C. SUGGESTIONS FOR FURTHER RESEARCH

In the light of limitations realized during the course of research work, following research suggestions are put forth:

The present study was conducted on 9^{th} class secondary school students of Jammu district only. Similar type of study can be conducted in the rest of the districts of Jammu and Kashmir and the other states of India. In the present study a sample of 245 students were taken. A similar type of study can be conducted on a sample of larger size. The present study is restricted to only the secondary school students of government schools only. A similar type of study can be conducted on private secondary school students. A comparative type of study can be conducted on the academic achievement and the preferences between students of division Kashmir and Jammu. A comparative type of study can be conducted on the academic achievement and the preferences for the leaning style between the private and the government secondary school students. Present study is limited to the secondary school students, a similar type of study can be conducted on senior secondary or the college level students.

Summary

CONCEPTUAL FRAME WORK

Academic achievement has always been considered to be a very important factor in the educational life of an individual, because good academic record over years predicts future success of a person. Education is unique asset and academic achievement is an essential aspect of it. The educational status of an individual in a society is greatly depicted through the academic achievement. Since time immemorial academic achievement of students has been a great concern to educationist. This trend has been now intensively felt by the academicians, parents and students. Strikingly, academic achievement has become a destructive index in determining a child's future. The prediction of academic achievement has been given greater importance during recent years because of various reasons. One of the reasons is the mushroom growth in student population which has created a lot of problems. The second is that child education has not been found to be commensurable with the efforts and huge expenditure made in this field. The third is concerned with the wastage of great human potentiates because it is often found that student perform much below their capacities. Nevertheless, both students and teachers share the same goal i.e to reach optimal learning. Educational programs and courses that are responsive to diverse student populations and their individual differences are essential. The question is why? The psychology of human differences is fundamental to learning and it opposes a one-size-fits-all approach to education. Therefore, for a learning environment to be optimally effective, it should capitalize not only on contextual but also the learner's characteristics. It is good practice to recognize and accommodate individual differences as well as to present information in a variety of ways through more than one modality. Educational institutions in order to capitalize the maximum intellectual resources of our youth; it is time for us to be the champion of individual differences. Educators seeking to effectively prepare qualified professionals should know the differences in how their students learn, recognize their critical thinking abilities **(Ferretti, Krueger, Gabel, & Curry, 2007)** and then consider how best to optimize the learning process. Unfortunately, educators teach the students as the differences between them do not exist and on the other hand they overlook the impact of the learning process **(Paul, Bojanczyk, &Lanphear, 1994).** Students, in response,

mostly feel dissatisfied with the learning process and the learning strategies and often perceive learning materials as lacking relevance **(Eyal& Cohen, 2006)**

LEARNING STYLE

Learning style refers to an individual's natural, routine and favored approach(s) of absorbing, processing and retaining new information and skills **(Reid, 1987).** Learning-style theory begins with **Carl Jung (1927),** who noted the main differences in the way people perceived (sensation versus intuition), the means by which they made decisions (logical thinking versus imaginative feelings), and how vigorous or thoughtful they were while interacting (extroversion versus introversion).Therefore, learning style considers the tendency of an individual towards a particular learning technique. **Keefe (1979)** defines learning style as the "combination of cognitive, affective and physiological factors that serve as comparatively firm indicators of how a learner perceives, interacts with and responds to the learning environment." **Stewart and Felicetti (1992)** define learning styles as those "type of environmental conditions in the class room in which a student learns the most". Every one of us can obtain benefit from a diversity of learning experiences. However, it is true that some ways of performing a task are more competent for one individual and not for the others and when the learners are given an opportunity to choose their best ways of learning and they will learn best than those who are compelled to learn by a style which does not suit them.

ACADEMIC ACHIEVEMENT

Academic achievement is playing a very significant role for determining the learning and the whole educational carrier of an individual. It has become one of the best goals which an individual has to achieve in the educational career of his life. In this present competitive era academic achievement has become a key for determining the future of a child. It is also a major goal, which every individual is expected to achieve in his field of life. Academic achievement is a key index by which an individual learns about his strengths and weakness, abilities and competencies which play an important role for developing career objectives. One of the most important outcomes of any educational set up is achievement of the students. Depending on the level of achievement, individuals are characterized as high achievers, average and low achievers. Taylor (1964) states that the value the student places depends upon his own sound effects of his academic achievement. In an educational institution the academic achievement is taken as any type of learning that is seen in the student's life.

Academic achievement means the knowledge gained and the techniques developed by the pupils in the subjects taught in the schools.

SIGNIFICANCE OF THE STUDY

Today the world is undergoing a change at a every second. Along with the scientific and technological development, complexities of life are increasing every day. In order to meet one's psychological and physiological needs, one has to strive hard to adjust himself in the present competitive world. Academic achievement is the key instrument which helps the students in making better adjustments in life. Good academic achievement is the key to success in personal and professional life. It brings economic security and social respect. It makes a person globally competent individual. Academic Achievement depends on various cognitive and non-cognitive factors like, aptitude, achievement motivation, socio-economic conditions, attendance, personality traits and teaching learning methods

STATEMENT OF THE PROBLEM

On the basis of the above discussion the problem can be stated as under:

Understanding Impact of learning style on the academic achievement; an exploration in context of secondary school students.

DEFINITIONS OF THE KEY TERMS:

LEARNING STYLE:

Learning style refers to the way one internally represents experiences and recalls or processes information. The learning style will be accessed on the basis of scores obtained by subjects on learning style inventory by K.S. Misra. This inventory attempts to measure six main learning styles namely-Enactive Reproducing, Enactive Constructive, Figural Reproducing, Figural Constructive, Verbal Reproducing and Verbal Constructive.

ACADEMIC ACHIEVEMENT:

It can be defined as accomplishment or gain of a performance carried out successfully by an individual or group on the completion of an academic task. In the present study it refers to the percentage of aggregate marks obtained by a particular student of 9^{th} class in first term examination respectively.

SECONDARY SCHOOL:

A secondary school is a school which provides secondary education, typically between the ages of 11-16, after primary school and before higher education

OBJECTIVES OF THE STUDY:

The objectives of the study were written as under:

1). To study the impact of learning style on the academic achievement of the secondary school students.

2). To study the impact of learning style on the academic achievement of the secondary school students with reference to their.

2.1. Enactive reproducing learning style.

2.2. Enactive Constructive learning style.

2.3. Figural reproducing learning style.

2.4. Figural Constructive learning style.

2.5. Verbal reproducing learning style.

2.6. Verbal Constructive learning style.

3) To study the impact of learning style on the academic achievement of the secondary school students with reference to their

3.1. Enactive learning style

3.2. Figural learning style

3.3. Verbal learning style

3.4 Reproducing learning style

3.5 Constructive learning style

4). To study the impact of learning style on the academic achievement of secondary school male students

5). To study the impact of learning style on the academic achievement of the secondary school male students with reference to their.

5.1. Enactive reproducing learning style.

5.2. Enactive Constructive learning style.

5.3. Figural reproducing learning style.

5.4. Figural Constructive learning style.

5.5. Verbal reproducing learning style.

5.6. Verbal Constructive learning style.

6) To study the impact of learning style on the academic achievement of the secondary school male students with reference to their

6.1. Enactive learning style

6.2. Figural learning style

6.3. Verbal learning style

6.4 Reproducing learning style

6.5 Constructive learning style

7). To study the impact of learning style on the academic achievement of secondary school female students

8).To study the impact of learning style on the academic achievement of the secondary school female students with reference to their.

8.1. Enactive reproducing learning style.

8.2. Enactive Constructive learning style.

8.3. Figural reproducing learning style.

8.4 Figural Constructive learning style.

8.5. Verbal reproducing learning style.

8.6 Verbal Constructive learning style.

9) To study the impact of learning style on the academic achievement of the secondary school female students with reference to their

9.1. Enactive learning style

9.2. Figural learning style

9.3. Verbal learning style

9.4 Reproducing learning style

9.5 Constructive learning style

10). To study the impact of learning style on the academic achievement of rural secondary school students

11). To study the impact of learning style on the academic achievement of the rural secondary school students with reference to their.

11.1. Enactive reproducing learning style.

11.2. Enactive Constructive learning style.

11.3. Figural reproducing learning style.

11.4. Figural Constructive learning style.

11.5. Verbal reproducing learning style.

11.6. Verbal Constructive learning style.

12) To study the impact of learning style on the academic achievement of the rural secondary school students with reference to their

12.1. Enactive learning style

12.2. Figural learning style

12.3. Verbal learning style

12.4 Reproducing learning style

12.5 Constructive learning style

13).To study the impact of learning style on the academic achievement of urban secondary school students

14). To study the impact of learning style on the academic achievement of the urban secondary school students with reference to their.

14.1. Enactive reproducing learning style.

14.2. Enactive Constructive learning style.

14.3. Figural reproducing learning style.

14.4. Figural Constructive learning style.

14.5. Verbal reproducing learning style.

14.6. Verbal Constructive learning style.

15) To study the impact of learning style on the academic achievement of the urban secondary school male students with reference to their

15.1. Enactive learning style

15.2. Figural learning style

15.3. Verbal learning style

15.4 Reproducing learning style

15.5 Constructive learning style

1.8 HYPOTHESES OF THE STUDY:

In the light of the above objectives the hypotheses of the study can be formulated as under

1). There will be no significant impact of learning style on the academic achievement of the secondary school students.

2) There will no significant impact of learning style on the academic achievement of the secondary students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

3) There will no significant impact of learning style on the academic achievement of the secondary school students with reference to their

I. Enactive style of learning

II. Figural style of learning

III. Verbal style of learning

IV. Reproducing style of learning

V. Constructive style of learning

4). There will be no significant impact of learning style on the academic achievement of the secondary school male students

5). There will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV.Figural Constructive learning style.

V.Verbal reproducing learning style.

VI. Verbal Constructive learning style.

6) There will no significant impact of learning style on the academic achievement of the secondary school male students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V Constructive learning style

7) There will be no significant impact of learning style on the academic achievement of the secondary school female students

8). There will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

9) There will no significant impact of learning style on the academic achievement of the secondary school female students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V. Constructive learning style

10) There will be no significant impact of learning style on the academic achievement of the rural secondary school students

11). There will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

12) There will no significant impact of learning style on the academic achievement of the rural secondary school students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V. Constructive learning style

13) There will be no significant impact of learning style on the academic achievement of the urban secondary school students

14). There will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their.

I. Enactive reproducing learning style.

II. Enactive Constructive learning style.

III. Figural reproducing learning style.

IV. Figural Constructive learning style.

V. Verbal reproducing learning style.

VI. Verbal Constructive learning style.

15) There will no significant impact of learning style on the academic achievement of the urban secondary school students with reference to their

I. Enactive learning style

II. Figural learning style

III. Verbal learning style

IV. Reproducing learning style

V Constructive learning style

DELIMITATIONS OF THE STUDY

The study is delimited in the following manner:

1. The study is delimited to Jammu
2. The study is delimited to the students of IX class only.
3. The study took only male –female and rural-urban factors into consideration
4. The present study is delimited to government schools only.
5. The present study has been conducted on 245 students only
6. The investigation has been confined to 9 secondary schools of Jammu district.

RESEARCH GAP

The topic chose should me such as it has not been investigated earlier. From a review of research and after conclusion whatever researches the investigator could come across through his sincere efforts did not find any study which has been done either in the country or abroad, on the present topic the topic being new and have not been investigated earlier, the researcher has received the attention for this topic. Hence the newness of the topic is also one of the reasons for the choice of the present study. The above review reveals that many scholars have studied the different factors which affect the academic achievement of the students. However a comprehensive yet concise research work focusing on those closely related academic achievement and learning style.

VARIABLES STUDIED

The variable which has been studied in the study is as under:

1. Learning style
2. Academic Achievement

SELECTION OF THE TOOL

In every type of research the investigator needs certain instruments to gather certain facts and explore new fields .The instrument thus employed are called tools. Different tools are suitable for collecting various kinds of information for various purposes. In the present study instrument employed for the collection of data is: **Learning Style Tool by K. S. Misra.** The investigator employed learning style inventory developed by K.S. Misra. It consists of 42 items which are having five responses from 1st, 2nd, 3rd, 4th, 5^{th} which were scored in reverse order as 5, 4, 3, 2, 1. The scores were added in an orderly manner as per the different learning styles of the students.

RELIABILITY

The three styles of learning having values of alpha reliability as for verbal style the value is .903, for figural style of learning the value is .742 and for enactive style of learning the value is .682. However the value of N is 150.

VALIDITY

The intrinsic validity was found by product moment method of correlation for the learning styles. The table Z depicts that enactive style of learning is positively correlated to the verbal and the figural styles of learning and positive correlation is found between the verbal and the figural styles of learning. It was found that positive correlation is found between all the styles of learning. The value of N is 100.

FINDINGS

The main findings of the present study are as under

1. There is significant impact of learning style on the academic achievement of secondary school students.
2. There is significant impact of learning style on the academic achievement of secondary school students with reference to ER, EC, FR, FC, VR, VC learning styles.

3. There is significant impact of learning style on the academic achievement of secondary school students with reference to enactive, figural, verbal, reproducing and constructive learning styles.
4. There is significant impact of learning style on the academic achievement of secondary school male students.
5. There is significant impact of learning style on the academic achievement of secondary school male students with reference to ER, EC, FR, FC, VR, VC learning styles.
6. There is significant impact of learning style on the academic achievement of secondary school male students with reference to enactive, figural, verbal, reproducing and constructive learning styles.
7. There is significant impact of learning style on the academic achievement of secondary school female students.
8. There is significant impact of learning style on the academic achievement of secondary school female students with reference to ER, EC, FR, FC, VR, VC learning styles.
9. There is significant impact of learning style on the academic achievement of secondary school female students with reference to enactive, figural, verbal, reproducing and constructive learning styles.
10. There is significant impact of learning style on the academic achievement of secondary school rural students.
11. There is significant impact of learning style on the academic achievement of secondary school rural students with reference to ER, EC, FR, FC, VR, VC learning styles.
12. There is significant impact of learning style on the academic achievement of secondary school rural students with reference to enactive, figural, verbal, reproducing and constructive learning styles.
13. There is significant impact of learning style on the academic achievement of secondary school urban students.
14. There is significant impact of learning style on the academic achievement of secondary school urban students with reference to ER, EC, FR, FC, VR, VC learning styles.

15. There is significant impact of learning style on the academic achievement of secondary school urban students with reference to enactive, figural, verbal, reproducing and constructive learning styles.

EDUCATIONAL IMPLICATIONS

Planning which plays a vital role in every field today is affecting the work of educational planners and policy makers also. The incorporation of opportunities and experiences which may develop the learning styles of children can be taken into consideration while designing the framework of curricular and co-curricular activities.

Curriculum forms the base in every field of education. Curriculum includes all the activities inside and outside the school which the child has to play. It means that it is the runaway or the path which the child has to follow. The curriculum framers should include such activities and experiences in the curriculum which can best fit the learning styles of the students

Books are the main agencies through which the students learn mostly in their academic field. It is the duty of the text book writers that while writing the text books the authors should write such topics and lessons in the text books by which the different types of learning styles of the students can be uplifted.

The teacher should organise the classroom activities in such a way that the students get equal opportunity for participation. Such practices should be encouraged that would help in boosting the learning style of students. The teacher should make use of various types teaching aids in the classroom. Interest oriented activities for enhancing students learning should be the focus of teachers which should suite the learning style of every student.

The parents should provide proper freedom and conductive environment for the expression of the thoughts and feelings of their wards; so that the experience of fearlessness gets reflected in their personalities in terms of high self-concept and the children to learn by the style which fits him best and will be able to express himself fully without any hesitation and that in turn will result in the development of balanced personality.

SUGGESTIONS FOR FURTHER RESEARCH

In the light of limitations realized during the course of research work, following research suggestions are put forth:

The present study was conducted on 9th class secondary school students of Jammu district only. Similar type of study can be conducted in the rest of the districts of Jammu and Kashmir and the other states of India. In the present study a sample of 245 students were taken. A similar type of study can be conducted on a sample of larger size. The present study is restricted to only the secondary school students of government schools only. A similar type of study can be conducted on private secondary school students. A comparative type of study can be conducted on the academic achievement and the preferences between students of division Kashmir and Jammu. A comparative type of study can be conducted on the academic achievement and the preferences for the leaning style between the private and the government secondary school students. Present study is limited to the secondary school students, a similar type of study can be conducted on senior secondary or the college level students.

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Prof. K.S. Misra *(Allahabad)*

Consumable Booklet of LSI-MK

(English Version)

Please fill in the following Informations : ***Date*** ☐☐☐☐☐☐☐☐

Name_____ **Sex : Male** ☐ **Female** ☐ **Age** ☐ **Year**

Father's Name_____ **Date of Birth**_____

Class_____ **Faculty : Arts** ☐ **Science** ☐ **Commerce** ☐

School/College_____

INSTRUCTIONS

On the following pages there are 42 statements about learning style. You are required to read each of the 42 statements and think how much preference you give to the given learning behaviour. Decide your answer on your actual behaviour on 5 alternatives, *viz.*, **Very Much, Much, Average, Less** and **Very Less**, (which is nearer to your behaviour) by putting a ☑ mark in the appropriate box.

Answer all the 42 statements. Your answers will be kept confidential.

I. **SCORING TABLE**

Learning style	ER	EC	FR	FC	VR	VC
Raw score						
z-Score						
Grade						

II.

Learning style	Enactive (ER + EC)	Figural (FR + FC)	Verbal (VR + VC)
Raw score			
z-Score			
Grade			

III.

Learning style	Reproducing (ER+FR+VR)	Constructive (EC+FC+VC)	Total
Raw score			
z-Score			
Level			

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Prof. K.S. Misra *(Allahabad)*

Consumable Booklet of LSI-MK

(English Version)

Please fill in the following Informations : **Date** ☐☐☐☐☐☐☐☐

Name_____ **Sex : Male** ☐ **Female** ☐ **Age** ☐ **Year**

Father's Name_____ **Date of Birth**_____

Class_____ **Faculty : Arts** ☐ **Science** ☐ **Commerce** ☐

School/College_____

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Sr. No.	STATEMENTS	PREFERENCE					Score
		Very Much	Much	Average	Less	Very Less	
1.	Understand lectures by listening tapes.	☐	☐	☐	☐	☐	☐
2.	Viewing figures on the computer.	☐	☐	☐	☐	☐	☐
3.	Explaining graphs in words.	☐	☐	☐	☐	☐	☐
4.	Memorizing by listening to others.	☐	☐	☐	☐	☐	☐
5.	Copying figures given in books with the help of carbon paper.	☐	☐	☐	☐	☐	☐
6.	Write self experiences related to various activities in one's own words.	☐	☐	☐	☐	☐	☐
7.	Reading loudly.	☐	☐	☐	☐	☐	☐
8.	Making diagrams given in books by tracing with the help of a pointed object.	☐	☐	☐	☐	☐	☐
9.	Asking teacher about the best solution from the many solutions.	☐	☐	☐	☐	☐	☐
10.	Reading self written answers of various questions again and again.	☐	☐	☐	☐	☐	☐
11.	Making the figure given in books in mind.	☐	☐	☐	☐	☐	☐
12.	Writing the method of doing any work step by step.	☐	☐	☐	☐	☐	☐
13.	Memorizing the relevant subject matter by writing it.	☐	☐	☐	☐	☐	☐
14.	Draw figures by looking at the figures given in book.	☐	☐	☐	☐	☐	☐
15.	Memorize similarities in almost similar things.	☐	☐	☐	☐	☐	☐

Areas	ER					EC	FR					FC	VR					VC
Item No.	1	4	7	10	13	–	2	5	8	11	14	–	3	6	9	12	15	–
Raw Score																		
Total Score																		

Sr. No.	STATEMENTS	PREFERENCE					Score
		Very Much	Much	Average	Less	Very Less	
30.	Comparing two or more verbal descriptions.	☐	☐	☐	☐	☐	▢
31.	Handing things while learning.	☐	☐	☐	☐	☐	▢
32.	Draw graphs on the basis of data.	☐	☐	☐	☐	☐	▢
33.	Considering any problem on the basis of various view-points.	☐	☐	☐	☐	☐	▢
34.	Make self efforts to make a model.	☐	☐	☐	☐	☐	▢
35.	Draw diagrams of organisms seen.	☐	☐	☐	☐	☐	▢
36.	Reorganize information received from various sources.	☐	☐	☐	☐	☐	▢
37.	Compare one's own new and old experiences.	☐	☐	☐	☐	☐	▢
38.	Make diagrams of things seen by oneself.	☐	☐	☐	☐	☐	▢
39.	Analyze the contents of many books while writing answer to questions.	☐	☐	☐	☐	☐	▢
40.	Relate new experiences about activities done by oneself to one's old experiences.	☐	☐	☐	☐	☐	▢
41.	Making main parts of every figure more attractive.	☐	☐	☐	☐	☐	▢
42.	Add new ideas while reading the subject matter of any lesson.	☐	☐	☐	☐	☐	▢

Areas	ER	EC				FR	FC				VR	VC				
Item No.	–	31	34	37	40	–	32	35	38	41	–	30	33	36	39	42
Raw Score																
Total Score																

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Consumable Booklet of Learning Style Inventory (LSI–MK) English
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