A STUDY OF LEARNING AND THINKING STYLES IN RELATION TO SELECTED COGNITIVE AND NON-COGNITIVE FACTORS OF PUPIL-TEACHERS OF MORADABAD DIVISION

ABSTRACT OF THESIS

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ABSTRACT

1.0 INTRODUCTION

As per the report of the World Bank (knowledge for development, 1999) the process of acquiring and absorbing knowledge and communicating the knowledge must be strengthened between the developing and the developed societies. In the present time, knowledge is the mightiest means of development. The modern world great economic are being built not only by accumulating human skills and capital but the foundation of information, learning and adaptation plays the greater role. Thus, knowledge is the chief source of development in the developing world. Different types of thinking, e.g., convergent and divergent thinking has contributed a lot to growth and development of economies, though it depends a lot in the thinking level and style of learners concerned. Thinking styles are ways to exploit thinking abilities. Thus, it can be concluded that the development and application of variety of Learning, thinking styles is greatly repressible for the development.

Many of the students have the abilities to succeed if they are guided properly by teachers. Failure of students in most of the caves is not the failure of students but their respective teachers who fail to recognize their students thinking and learning styles. It was found by Sternberg (1977) who suggested that the educational implications stemming from convergent divergent thinking styles are for reaching. For sciences and mathematics convergent thinking styles are considered to be more conducive and for arts, teaching and divergent thinking styles. It was found by Hudson (1966) that generally formal problems and tasks that are better structural and demand greater logical ability than the more opened problems are preferred by individual with convergent thinking styles. This is why; we need styles of students if we intend them to exhibit their mental capacities to the utmost. This further suggests that there is need to further investigate the thinking styles of students.

Thinking and learning styles of students influence their scholastic achievement. These thinking include students learning and thinking styles preference, their interest in the material to be studied and the learning environment.

A learning and thinking styles preference refers to the way the student responds to a stimuli in the context of learning as well as their characteristic way of acquiring and using the acquired information. These learning styles show the way a student leaves and the way be interprets the acquired material (Bailey and Garratt (2002).

According to James and **Gardner (1995),** Learning styles are the ways individual learners react to the overall environment.

According to **Ausubel, Novak and Hanesian,** Learning and Thinking styles are self consistent, enduring individual differences in cognitive organization and functioning.

According to **Gregorc (1979),** learning and thinking styles are distinctive behaviors which serve as indicators of how a person leaves from and adapts to his environment. It also gives a clue of as to how persons mind operates.

According to **Dunn and Dunn (1993),** Learning styles are the way each learner begins to concentrate on process, and retain new and difficult information.

According to **Grasha (1990),** Learning styles are preferences that students have for thinking, relating to others and for various classroom environments and experiences.

According to **Keefe (1987),** Learning styles are a consistent way of functioning that reflects the underlying causes of learning behavior.

Dunn and Dunn (1991), has stated that Learning Styles differ among students. Some of the ways learning styles between individuals can differ are amongst achievement levels, gender, age and culture individuals, achievement levels can be high versus low academic achievement.High and law achieves are not likely to perform well with the same methods of learning.

Further **Dunn and Griggs (1995),** lave found that- “Differences in gender environment than females. They are more or teacher motivated.”

Pizzo, Dunn and Dunn (1990), found that- 'Females, more than males while learning and learning, styles may change as individual grow older. It was further found by Dunn and Griggs (1995) that some individuals change uniquely while others do not change at all with the increasing age. Physiological, emotional and sociological preferences of individuals change with them increasing age. For example, sociological preferences indicate whether an individual chooses to learn alone or with a group. Emotional preferences refer to motivation which fluctuates from day to day, class to class and teacher to teacher. A student's motivation tends to be greater if he interested in a topic and presenters teaching style matches the student's learning style. While the individual get older their sound preferences, temperature preferences and reality preferences tend to changes.

Emotional preferences are the need for breaks for interaction. Older adults require less structure.

So for physiological preferences are concerned with tactual learning, kinesthetic learning and virtual learning. It includes time preferences and their length and also mobility preferences.

Diversity in learning styles among different cultures has also been found and to it is not good for teachers to approach students with a cultural mindset. Instead, learning styles of each student and interventions that are compatible with there preferences must be designed.

2.0 STATEMENT OF THE PROBLEM

Through various researches and approaches to college teaching have been made in the post years, yet no method or approach has been found to be consistently superior. Now the important question that arises is as to under what conditions pupils can learn best. The emerging area having a lot of scope is the 'Pupils' styles of learning and thinking. If is also very new and challenging, specially. For Indian teacher and researchers. Several variable are there that are needed to be investigated with regard to learning and the thinking styles of thinking styles of the pupils academic achievement,

sex and academic discipline, emotional intelligence and personality type are significant among them.

The following is the problem to be studied:

"A STUDY OF LEARNING AND THINKING STYLES IN RELATION TO SELECTED COGNITIVE AND NON-COGNITIVE FACTORS OF PUPIL-TEACHERS OF MORADABAD DIVISION"

3.0 NEED AND JUSTIFICATION OF THE STUDY

It has been observed that different pupils learn and think in their unique individualized ways irrespective of their level (school, college or university) for every society of developed or developing countries, post-secondary education, high education and teacher education in becoming increasingly important. It is more important for the society of such people as make mid-life change in their career or also for those who in their leisure count to achieve teacher education and further contribute to the increasing demand of teachers through formal or non-formal modes.

Now the pertinent question is as to how to teach pupil-teachers more effectively and efficiently? In some countries abroad some work has been done on the thinking and learning styles of pupils. In our country, no such attempts has been made so far. Therefore, a considerable scope is seen in the area of learning and thinking styles of pupil-teachers in socio-cultural arena of Indian society. Learning and thinking styles are significant components of the learning. Process of teacher-training education. For obtaining a comprehensive picture of learning process of pupil teachers, their understanding is highly derivable so that their teaching efforts may be enriched. In order to enhance quality control in education process. The need for the proposed study is vividly clear in view of the above and the same prompted the researcher to undertake the present study.

So that the teasing may be convenient and easy to undertake, each hypothesis has been devised into specific hypotheses based on learning and thinking styles of pupil teacher.

4.0 OBJECTIVES

The following objectives were realized in the proposed study:

1. To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Academic Achievement.
2. To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Gender.
3. To Study the difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.
4. To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Personality Type.
5. To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Emotional Intelligence.

5.0 HYPOTHESES

The following hypotheses have been tested in the proposed study:

1. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High, Average and Low levels of Academic Achievement.
2. There is no significant difference in Learning and Thinking Styles of Male and Female Pupil-Teachers.
3. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.
4. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having:

    4(a) Extrovert Type and Introvert Type Personality

    4(b) Neurotic Type and Stable Type Personality

5. There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High and Low levels of Emotional Intelligence.

However, for the sake of convenience of testing each hypothesis was into specific hypotheses based on learning and thinking styles.

6.0 SCOPE AND DELIMITATIONS

In terms of the objectives of the study, hypotheses formulated and the research methodology adopted, the present study work may be assessed and evaluated. Besides, the population, samples, variables, tools and statistical techniques adopted are also to be taken into account. In terms of the objectives, this study was delimited as these are concerned with determining the differences in thinking and learning styles with relation to cognitive and non-cognitive factors of pupil-teachers. Academic achievement in the cognitive factor and the sex, stream of study, personality type and emotional intelligence are the non-cognitive factors. Further the study is concerned with the testing of the null hypothesis and the descriptive methods of research were applied. The population of the study is comprised of the pupil teachers belonging to three disciplines, Arts, commerce and Science the sample was drawn from the colleges of Moradabad Division -Govt., Govt. aided & privately managed colleges. The institutions were randaomly selected and the random stratified sampling technique was adopted.

In terms of variables also the study was delimited. The Academic Achievement was treated as dependent variable and the independent variables were learning and thinking styles, gender stream, personality type and emotional intelligence.

The tools for collecting the present data were SOLAT by Venkatraman (Torrance et.al's), Eysenck's MPI and Mangal Emotional Inventory. The Institute gazette was the source of Academic Achievement (marks obtained by the students). The t-Test and One-way analysis of variance technique were used to analyze the data. For depicting differences in the mean scores of Learning and Thinking Style in respect of various groups, graphs have been used. The terms of the limitation of time and financial resources, the study needed to be delimited.

7.0 DEFINATION OF THE KEY TERMS USED

To bring precision and clarity, the key terms used in the present study are being defined as under-

LEARNING AND THINKING STYLE : The way one prefers to learn and think using one's mental abilities and capacities.

- **Left hemispheric style:** It is one's inclination to use the left hemisphere of one's brain for processing the information received.
- **Right hemispheric style :** For processing the received information, one's inclination to use the right sphere of one's brain is referred as Right Hemispheric Style.
- **Integrative style :** For processing the information, inclination to use both (the hemispheres the left and the right) is referred as integrative style.

PERSONALITY TYPE : Refers to one's personality traits- Extroversive or Introversive and Neurotic or Stable as measured by Eysenck.

- **Extrovert (Extroversive) Type:** One who is least centered around shyness and withdrawal and is more social.
- **Introvert (Introversive) Type:** One who is shy and prefer to be alone..
- **Neurotic Type:** One who is emotionally over responsive and break down emotionally when under stress.
- **Stable Type :** Refers to one's neurotic stability even when one is under stress.

EMOTIONAL INTELLIGENCE: Refers to the capacity of one's brain to handle different emotional situation and responses thereafter.

- **COGNITIVE FACTORS:** Refers to one's Academic Achievement and Emotional Intelligence.
- **NON COGNITIVE FACTORS:** Reference is made to Sex or Gender, Stream chosen and the type of Personality of individuals.

8.0 METHOD OF RESEARCH

The aim of the present study was to know the thinking and learning styles of pupil-teachers in relation to their scholastic achievement and emotional intelligence and also with the non- cognitive characteristics, like- gender, stream and their personality

type. As the nature of the study is concerned it required the descriptive analysis of the learning and thinking styles of the pupil-teachers selected for the study. For this only survey method was found to be suitable for the present investigation. Descriptive survey method describes and gives the interpretation of what exists at present. Hence we are concerned with relationships that exist, the prevailing practices and the attitudes that are hold, the processes and the influences and the developing trends.

Good (1963) has pointed out that "Descriptive research method includes presentation of facts or current conditions concerning the nature of a group of persons number of subjects or class of events and involves the procedure of induction analysis classification enumeration or measurement".

Thus keeping in view the objectives of the study it was decided by the investigator to use the Descriptive Method of the research.

9.0 POPULATION OF THE STUDY

According to **Guilford (1965),** "a population is a well defined group of individuals or of observations". In the words of **Best** and **kahn (1996),** "a population is any group of individuals that have one or more characteristics in common that are of interest to the researcher. The population may be all the individuals of a particular type or a more restricted part of that group".

The population of the present study included all the pupil-teachers studying in B.Ed. 1st year of arts, science and commerce background in all the colleges of Moradabad division. It included the pupil-teachers of government, govt. aided and the private co-ed colleges in Moradabad Division.

10.0 SAMPLE OF THE STUDY

A sample is small proportion selected for observation and analysis is the representative of a large population. By observing the characteristics of the sample one can make certain inferences about the characteristics of the population from which it is drawn.

The essential requirement of any sample is that it is supposed to be the representative of the vast population. **Miller (1977)** states that, "the scope of generalization of the finding depend on the representativeness of the sample . Infect good sample is one which is unbiased and representative of the whole population".

In the present study an attempt was made to select a representative and unbiased sample. The random sampling technique was employed forwarding the sample.

First of all, a list of all B.Ed. colleges of Moradabad division was prepared. Then colleges were randomly selected adopting simple lottery method. There after one section of each science, arts and commerce stream was selected randomly from each selected college in the Moradabad Division.

To meet the requirement of study, the random sampling methods were used in selecting sample. Initially collected sample was of 400 respondents in total. As the objectives of the study to SOLAT with Science, Arts and Commerce stream pupil-teachers only, so the investigator on need of the study has reduced all the data from 400 to 360 accordingly. This reduced data provide him base for final analysis of the results as requirement of the objectives of the study. Hence in the study the investigator has used only a data of 360 respondents in analysis and interpretation. The distribution of final data that used in the analysis and interpretation has been presented below on diagram:

11.0 TOOLS USED

For carrying out the investigation, the data is gathered and the hypotheses are tested. Because each data gathering tools has its own particular weakness or bias it is needed to be evaluated in terms of certain desirable attributes of good tool and finally select the one which seems to be free from major weakness and serves the purpose. Reliability, validity and appropriateness are studied before the selection of a tool for collecting the data. Since selection of suitable tool is of vital importance for successful research.

In the present study the following tools were employed for data collection.

- Style of Learning and Thinking (SOLAT) – by D. Venkataraman

- Moudsley Personality Inventory (MPI) – by Eysenck (An Indian adaptation by Jalota and Kapoor)

Mangal Emotional Intelligence Inventory (MEII) – by Mangal and Mangal

12.0 DATA COLLECTION

For data collection , first of all class teachers of concerned college were decided. Thereafter, selected tools were administered. However before administration of the tests. Pupil-teachers were told the purpose of the study and importance of their cooperation in data collection. After putting them into proper frame of mind, tests were distributed according to schedule.

13.0 STATISTICAL TECHNIQUES USED

Statistics is a body of mathematical techniques use or processing for gathering organizing analyzing and interpreting numerical data. Because most research yields such quantitative data, statistics is a basic tool of measurement evaluation and research.

As the focus in the present study was to ascertain the significant differences in mean scores of learning and thinking style (s) of pupil-teachers in relation to academic achievement gender, stream, personality type and emotional intelligence two statistical techniques namely one way analysis of variance and T -tests were performed depending upon the comparison of three and two groups. In case of comparison three groups, one way ANOVA was used and in case of comparison of two groups, t test was employed . In case of significant F also t test was used to pin point the exact source of difference in three means.

14.0 MAIN FINDINGS

After analysis and interpretation of the data the next assignment is presentation of the main findings. In the light of the interpretation of the results of the present investigation, the following are the main findings.

O1- To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Academic Achievement.

$H_0$1- There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High, Average and Low levels of Academic Achievement.

$H_0$1.1- There is no significant differences in Left Hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low levels of Academic Achievement.

F1.1- Hypothesis accepted.

$H_0$1.2- There is no significant differences in Right hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low levels of Academic Achievement.

F1.2- Hypothesis rejected.

$H_0$1.3- There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers having High, Average and Low Academic Achievement.

F1.3- Hypothesis accepted.

O2- To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Gender.

$H_0$2- There is no significant difference in Learning and Thinking Styles of Male and Female Pupil-Teachers.

$H_0$2.1- There is no significant difference between Male and Female pupil-teachers with regard to their Hemispheric Style of Learning and Thinking.

F2.1- Hypothesis accepted.

$H_0$2.2- There is no significant difference between male and female pupil-teachers with regard to their Right Hemispheric Style of learning and thinking.

F2.2- Hypothesis accepted.

$H_0$2.3- There is no significant difference between Male and Female pupil-teachers with respect to their Integrated Style of Learning and Thinking.

F2.3- Hypothesis rejected.

O3- To Study the difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.

$H_0$3- There is no significant difference in Learning and Thinking Styles of Pupil-Teachers belonging to Science, Arts and Commerce Streams.

$H_0$3.1- There is no significant difference in Left Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.

F3.1- Hypothesis rejected.

$H_0$3.2- There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.

F3.2- Hypothesis rejected.

$H_0$3.3- There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers belonging to Science, Arts and Commerce streams.

F3.3- Hypothesis accepted.

O4- To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Personality Type.

$H_0$4- There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having Extrovert Type, Introvert Type, Neurotic Type and Stable Type Personality.

$H_0$4(a)- There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having Extrovert Type and Introvert Type Personality

$H_0$4.1(a)- There is no significant difference in Left Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type Personality

F4.1(a)- Hypothesis rejected.

$H_0$4.2(a)- There is no significant difference in Right Hemispheric Style of Learning and Thinking of pupil-teachers having Extrovert and Introvert type pupil-teachers.

F4.2(a)- Hypothesis rejected.

$H_0$4.3(a)- There is no significant difference in Integrated Hemispheric Learning and Thinking style of pupil-teachers having Extrovert and Introvert type Personality.

F4.3(a)- Hypothesis accepted.

$H_0$4(b)- There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having Neurotic Type and Stable Type Personality.

$H_0$4.1(b)- There is no significant difference in Left Hemispheric Learning and Thinking style of pupil-teachers having Neurotic and Stable type Personality.

F4.1(b)- Hypothesis rejected.

$H_0$4.2(b)- There is no significant difference in Right Hemispheric Learning and Thinking Style of pupil-teachers having Neurotic and Stable type Personality.

F4.2(b)- Hypothesis accepted.

$H_0$4.3(b)- There is no significant difference in Integrated Hemispheric Learning and Thinking style of pupil-teachers having Neurotic and Stable type Personality.

F4.3(b)- Hypothesis accepted.

O5- To Study the difference in Learning and Thinking Styles of Pupil-Teachers in relation to their Emotional Intelligence.

$H_0$5- There is no significant difference in Learning and Thinking Styles of Pupil-Teachers having High and Low levels of Emotional Intelligence.

$H_0$5.1- There is no significant difference in Left Hemispheric learning and thinking style of pupil-teachers having high and low levels of emotional intelligenc.

F5.1- Hypothesis rejected.

$H_0$5.2- There is no significant difference in Right Hemispheric Learning and Thinking Style of pupil-teachers having High and Low levels of Emotional Intelligence.

F5.2- Hypothesis accepted.

$H_0$5.3- There is no significant difference in Integrated Hemispheric Style of Learning and Thinking of pupil-teachers having High and Low levels of Emotional Intelligence.

F5.3- Hypothesis accepted.

15.0 CONCLUSIONS

The ultimate goal of any scientific research is to arrive at a final answer to the research question with which the investigation was conducted. Conclusions flow form the analysis and interpretation of data. In the words of pander (1983) conclusions is a kind of 'summing up' of a 'final pronouncement' on the fate of hypotheses tested by the research.

The following conclusions were drawn on the basis of preceding chapter.

15.1 LEARNING AND THINKING STYLES IN RELATION TO ACADEMIC ACHIEVEMENT

Pupil-teachers differed significantly only on one learning and thinking style (Right Hemispheric style) in relation to their academic achievement. Low achievers were significantly more right hemispheric oriented than high achievers.

On rest of the learning and thinking styles viz, left hemispheric and integrated hemispheric style no significant differences were found.

15.2 LEARNING AND THINKING STYLES IN RELATION TO GENDER

Male and Female pupil-teachers differed significantly in one learning and thinking style only i.e. Integrated hemispheric style. Female pupil-teachers tended to be more Integrated than Male pupil-teachers in their style of learning and thinking.

On remaining learning and thinking styles, No significant differences between male and female pupil-teachers were observed. These styles were – left hemispheric and right hemispheric style.

15.3 LEARNING AND THINKING STYLES IN RELATION TO STREAMS

Pupil-teachers belonging to science, arts and commerce streams differed significantly in styles of learning and thinking. Science pupil-teachers were more left hemispheric dominated than pupil-teachers belonging to arts and commerce streams. Arts pupil-teachers were more right hemispheric oriented as compared to science and commerce pupil-teachers.

On rest of learning and thinking styles viz, integrated, no significant differences were found among pupil-teachers of science, arts and commerce streams.

15.4 LEARNING AND THINKING STYLES IN RELATION TO PERSONALITY TYPE (INTROVERT AND EXTROVERT)

Extrovert and introvert type of pupil-teachers did exhibit significant differences in their two learning and thinking styles only viz, left hemispheric and right hemispheric learning and thinking style. Introvert pupil-teachers were more left hemispheric in their learning and thinking style than extrovert type of pupil-teachers. While extrovert pupil-teachers were more right hemispheric in their learning and thinking styles than introvert pupil-teachers.

On rest of the learning and thinking styles namely-integrated, no significant differences were observed between pupil-teachers having extrovert and introvert type of personality.

15.5 LEARNING AND THINKING STYLES IN RELATION TO PERSONALITY TYPE (NEUROTIC AND STABLE)

The neurotic and stable type of pupil-teachers differed significantly in one learning and thinking style i.e. left hemispheric style. Stable left hemispheric type pupil-teachers were found to be higher than neurotic type of pupil-teachers.

In learning and thinking styles viz, right hemispheric and integrated hemispheric style, no significant differences were found between neurotic and stable type of pupil-teachers.

15.6 LEARNING AND THINKING STYLES IN RELATION TO EMOTIONAL INTELLIGENCE

Pupil-teachers exhibited significant difference in left hemispheric learning and thinking style in relation to emotional intelligence. High emotional intelligence group of pupil-teachers obtained significantly higher mean scores on left hemispheric style of learning and thinking in comparison to the low emotional intelligence group of pupil-teachers.

On the remaining learning and thinking styles i.e. right hemispheric and integrated hemispheric style, no differences were found between high and low level of emotional intelligence pupil-teachers.

16.0 EDUCATIONAL IMPLICATIONS OF FINDINGS

On the basis of findings of the present study the following implications were drawn for higher education and teacher education.

The findings show that the academic achievement of pupil-teachers is linked with their learning and thinking styles. Low achieving pupil-teachers were more prone to right hemispheric style of learning and thinking. This suggests that administrators in the field of education should use new strategies to improve the pupil's academic achievement by properly diagnosing the factors hindering the achievement of pupil-teachers.

Female pupil-teachers were found more Integrated than their male counterparts in their learning and thinking style. Hence educational planners may keep this in mind for various developments.

Stream is found to have vital links with learning and thinking styles of pupil-teachers. Pupil-teachers of science stream were found more left hemispheric style oriented than arts and commerce pupil-teachers. This underlying fact should be kept in

mind by educational counselors and teacher educators for guiding the pupil-teachers in various fields for the proper development of their talent.

Learning and thinking styles also affect the extrovert and introvert type of personalities of the pupil-teachers. This fact must be considered by the teacher educators inside and outside classroom situations for grooming the pupil-teacher's personality.

Learning and thinking styles have found to be having a close relationship with neurotic and stable type of pupil-teachers. Stable pupil-teachers are found more left hemispheric than neurotic type of pupil-teachers. Psychologists may thus consider this fact for helping the pupil-teachers to groom their personalities for their personal development.

Learning and thinking style is found to have a vital link with both levels of emotional intelligence viz, high emotional intelligence and low emotional intelligence. Pupil-teachers with high emotional intelligence were found to be more left hemispheric learning and thinking style than pupil-teachers with low emotional intelligence. While pupil-teachers having low emotional intelligence and high emotional intelligence were found equally oriented in their right hemispheric learning and thinking style.

It may thus be inferred that, intervention strategies may be employed in order to enhance the development of desired learning and thinking styles of pupil-teachers.

Moreover, classroom business, curriculum framing, assignment designing should be based on learning and thinking styles of pupil-teachers so that diversity in learning and thinking styles of pupil-teachers may be property exploited for their development.

According to West, MIT prof. (1978), The right hemisphere appears to have been able to outcome the most difficult, logical and systematic problems which we would hypothesized relaxing the right standard of thought of the left hemisphere. The right hemisphere was perhaps able to design through the experiments which the left hemisphere could not, because of its rigidity. The right hemisphere is thus able to hit upon solutions which could then of course, be recast into strictly logical terms by the left hemisphere.

The right hemisphere processing mode is also hypothesized to be prevalent according to the findings of Hadamard (1945) and Hebb (1966), when artistic judgement is required in task. It is evident that the right cerebral hemisphere makes significant contribution to human performance. It takes in fragmentary sensory information and from it construct a coherent outside world..

Schools are structured environments that run according to time schedules, Favour facts and rules over patterns, and offer predominantly verbal instruction, especially at the secondary level with which right hemisphere learners are not comfortable with. The stronger the right hemisphere, the more hostile the learning environment seems.(Sousa, 2006).

Traditional teaching methods tend to favour strong sequential learners. Concepts are usually presented step by step, practiced with drill and repetition, reviewed, and then tested under timed conditions. Consequently, gifted visual-spatial learners may have greater difficulty in traditional classrooms and their talents may not be fully recognized (Sousa,2003).A left brained curriculam tends to downplay right brain's superior capabilities.(Staley, 1980).

Researches done by Reynolds and Torrance (1978), Bracken and Torrance (1979) and Venkatraman (1989) are indicative that it is possible that a person's preferred style of learning and thinking over relatively brief period (6 to 10 weeks may be modified). It is also possible to control the changes in the style of learning and thinking with the Knowledge concerning their mechanism. It may also be possible to train individuals to modify their information processing procedures as per their demands and the cognitive tasks.

Some of the procedures that can be undertaken in institutions to activate the right hemisphere are as following:

- Maps, Films, charts, diagrams, graphs and cartoons etc. may be used as teaching learning on a trial displayed. Based on the pictures shown students can be instructed to construct stories or incomplete stories can be given for completion in exercises.

- Learning by doing should be encouraged at all levels of education. All students may be given opportunity to work on simple projects and should be assisted in carrying them out. Use of Metaphors and analogies in subjects can be made, to enhance analytical thinking in students.

- Role playing technique in the teaching of history, language and also in science subject is important and should be given due importance. Divergent questions may be asked to enable students to think and answer in various ways.

- Specific issues should be given to students for solution. Students must be encouraged to record their ideas and write stories, essays, plays, dialogues and talks.

- Abilities of students in sports, music and arts should be recognized and cultivated. Children may be encouraged to play with words and interest should be created in preparing models and construction of buildings using cubes, blocks and clay.

- Training in drawing visual patterns and geometric designs will be encouraging with the help of pictures. Students should be asked to identify the figures of famous personalities, locations, buildings and streets.

- Excursion and field trips must be arranged to encourage and satisfy pupil's curiosity and sense of observation.

No doubt, right hemisphericity is more important in cognitive process but to complete a full task both hemisphericity play important role.

Procedures to Activate Left Hemisphere in institutions:

- New concepts should be introduced in an analytical manner with verbal emphasis and importance can be given to the expression of the language in the classrooms.
- Students should be asked to clarify abstract speeches aired in the radios, televisions, public meetings and symposium.

- They should be given training in analyzing and identifying different speech sounds and encouraged to give logical reasoning and examples for unknown activities or functions without experimenting.
- Discussions should be arranged on general problems, world affairs published in daily newspapers and magazines. They should be encouraged to write non-fiction essays and scientific explanations in simple language.
- Games based on verbal materials, numerical, events and meditation should be encouraged after studies.

The right hemisphere is especially important in regulating attention functions of both sides of the brain. Unless the right hemisphere is activated and engaged, attention is low and learning is poor. **(Levy, in Silverman, 2002).** People who approach learning with a left mode processing preference have beautiful gifts. People who approach learning with a right mode processing preference have beautiful gifts. People who access their whole brain flex and flow, they have both sets of beautiful gifts. **(Mc Carthy, 1993).**

17.0 SUGGESTIONS FOR FURTHER RESEARCH

After conducting the present study, it was feel that researches may undertaken by the investigators on the following lines:

- Studies should be designed to investigate their gender differences in learning and thinking styles of university and college pupil-teachers by using some inventories of learning and thinking styles.
- An investigation to explore the relationship of learning and thinking styles of pupil-teachers by using Cattell's personality questionnaire should be undertaken.
- Learning and thinking styles of pupil-teachers can be studied with their personality enhancement requirements.
- To compare the learning and thinking styles of pupil-teachers belonging to professional courses a study should be designed.

- Learning and thinking styles of students should be studied at different levels of academic career.
- A cross-cultural study may be designed on learning and thinking styles of pupil-teachers.
- Learning and thinking styles of pupil-teachers as a function of intelligence and creativity should be investigated.
- A study should be carried on to find out the differences in learning and thinking styles of pupil-teachers in relation to self confidence, self-concept and anxiety levels.
- A comparative study regarding learning and thinking styles of pupil-teachers coming from disadvantaged sections of the society should be made.
- With a view to find out the differences in learning and thinking styles of intellectually, creativity and academically talented pupil-teachers a study will be useful.
- A comparative study should be done on learning and thinking styles of well-adjusted and mal-adjusted pupil-teachers.
- Learning and thinking styles of pupil-teachers may be investigated in relations to their background factors.
- The relationship between learning and thinking styles of pupil-teachers and college teachers may be undertaken.
- The interaction between learning and thinking styles of pupil-teachers and teaching strategies used at college level is suggested.
- A study exploring the relationship between learning and thinking styles of pupil-teachers and quality of intellective performance may be fruitful.
- Learning and thinking styles of pupil-teachers in relation to dogmatism may be done.

- Role of Socio-economic status in learning and thinking styles based on gender, culture and inhabitance of pupil-teachers should be done.
- Learning and thinking styles of students relation to different types of creativity viz. musical, artistic, linguistic and mathematical should be explored.