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## A STUDY OF LEARNING AND THINKING STYLES IN RELATION TO INTELLIGENCE



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**Introduction :** Students preferentially take in and process information in different ways: by seeing and hearing, reflecting and acting, reasoning logically and intuitively, analyzing and visualizing, steadily and in fits and starts. It is not necessary that one learns with one way, another will learn with same way. If the learner discovers how he process information best, he can learn things more efficiently and in less time. That may help to expand the strategies on use for learning and studying. When learning something new or difficult, one naturally tends to use the learning style you prefer. It is good to know what this learning style is so that one can respond most effectively to the material being presented. Even when the material is not presented in the way one prefers, one can use to adjust and be flexible.

In recent years, there has been a massive increase of interest in the psychology of thinking and learning. Several researchers have emphasized the importance of different learning processes. Schmeck Rebich & Ramamaiah (1979) used behaviourally orientated statements to access the important learning processes in the academic setting. Influx of information completed with the teaching and learning environment in different streams in school and college impact/influence student's learning. The generation of new information is also accelerating at an alarming rate. They also felt that individual differences among students are so extreme and unique that have a particular way for make learning. Hence, there is an ur-

gent need to examine each individual learner living in different type of environment to identify exactly how he or she is likely to learn most effectively. To know about students (how, when, what and where they learn best) is very much helpful to be aware of their learning process. No two persons have the same conception about him or about world as the individual's cognitions/thinking reflect his own environment, his wants, his goals, his experiences, etc. E.L. Thorndike (1898) pioneered the experimental study of animal behaviour (way to acquire) and intelligence. From his observations of how animals escape from puzzle box confinement (by pressing levers, pulling strings etc.), Thorndike came to the conclusion that problem solving, at least in lower animals, proceeding on the basis of overt-trial & error. The phenomenon of the process of learning in a classroom context or in open life situation is characterized by its individualistic nature. Learning is purely individualistic. No teacher can teach his/her students, students learn themselves. The activities by teacher in the classroom are to direct & stimulate student-learning.

**Importance of the Study :** Concept of learning styles and strategies have been advocating that every learner has his unique way of learning i.e., Learning style which enables learner to learn best according to level. To know about student's learning styles is also helpful to improve teaching-learning process; teacher needs to diagnose the styles and strategies of learning of his students and to prepare instructional

strategies to make them effective learners. It may be accepted that learning capabilities affect the intelligence & intelligence of individual help to learn. Schultz (1997) suggested that awareness and understanding of different learning styles or strategies help the teachers in becoming diagnosticians, prescribers and educational designers which in turn facilitates.

The issue of learning style is based on the concept of cognitive style. Learning is nothing but an ability to look at objects, stable and a meaningful perspective, which results in a more effective adaptation. Learning styles may be regarded as a link with intelligence. As learning style include the characteristics of cognitive, affective and physiological behaviour.

**Objectives of the Study :** The present study was carried out with the following objectives; 1. To study the relationship between different learning and thinking styles and intelligence of girls students. 2. To study the relationship between different learning and thinking styles and intelligence of boys’ students. 3. To study the relationship between right and left cerebral hemisphere of girls’ students belonging to high and low intelligence groups. 4. To study the relationship between right and left cerebral hemisphere of boys’ students belonging to high and low intelligence groups.

**Hypotheses of the Study :** The following hypotheses were built in, taking into view the following objectives: 1. There will be no significant relationship between different learning and thinking styles and intelligence of girls’ students. 2. There will be no significant relationship between different learning and thinking styles and intelligence of boys’ students. 3. There will be no significant relationship between right and left cerebral hemisphere of girls’ students belonging to high and low intelligence groups. 4. There will be no significant relationship between right and left cerebral hemisphere of boys’ students belonging to high and low intelligence groups.

**Delimitations of the Study :** The present study has the following delimitations. 1. The present study delimited to 130 students. 2. The present study is based on the students studying in XII standards. 3. All the students are belonged to state government schools and privately managed schools.

4. Schools are taken from Ahmedabad district of Gujarat state only. 5. The study is limited to two variables i.e., learning and thinking styles and intelligence. 6. The present study is based on the students studying in English medium schools only.

**Sample of the Study :** The population of the present study comprised class XII students. The sample was selected by random sampling technique. This was correlation study in which the students were divided into two portions. Higher Secondary schools were selected from Ahmedabad district, Gujarat. The sample profile is given in table no. 1 as below:

**Table No. 1-Sample Profile**

**Variables of the Study :** The variables to be measured in the present study are learning styles (Thinking & Learning Styles) and Intelligence.

**Learning Styles :** The term “Learning Style” was probably, first used by Thelen (1954) in discussing the dynamics of group at work. Further it was expanded by D. A. Kolb in 1970 and provides this concept proper base and platform. So many other contributors like Dunn and Dunn, Hunt, Verma and Aggarwal in India, used this term and work on this concept. The term has been conceptualized in several ways since that time. At present time, two lines of research which attempt to explain the underlying processes of learning and teaching.

One groups is working with applied models of learning style e.g., Hill (1976); Hunt et. al. (1978); Dunn and Dunn (1978). Interview techniques or self-report questionnaires are used to identify students’ perceptions of their own characteristic traits.

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Second group of researchers retains a strong preference for the cognitive style dimension. Such types of models are bi-dimensional rather than simple bi-polar. An example of this type model is developed by Mckenney, which identified the human information processing into two dimensions: information gathering and information evaluating.

**Intelligence** : The concept of intelligence occupies a peculiar position within the field of psychology. But defining intelligence is highly problematic. That is because intelligence consists of knowledge, skills and many other aspects related one’s life. Intelligence also connects to the causes and potential solutions of deep-rooted social problems. Is there an ‘intelligence’ that equips us to solve all kinds of problems and answer all questions, regardless of their nature? Or are there different intelligences that help us deal with particular problems and solutions? Many prominent researchers have offered their own definitions of intelligence: Cyril Burt “..... innate general cognitive ability”. Howard Gardner: “to my mind, a human intellectual competence must entail a set of skills of problem-solving-enabling the individual to resolve genuine problems of difficulties that he or she encounters and, when appropriate, to create an effective product and must also entail the potential for finding or creating problems and thereby laying the groundwork for the acquisition of new knowledge.”

**Tools of the Study** : The variables were measured by using the readymade standardized appropriate tools. The tools used in the present study are shown in the table No. 2 below:

**Table No. 2-List of Tools**

Sr.No.	Name of tool	Name of Constructor
1.	Style of Learning and Thinking (SOLAT)	D. Venkataraman
2.	Samoochik Mansik Yogyata Pariksha (1/61)	R. K. Tandon

The number of the 50 pairs that the each dimension measures in two styles, of learning and thinking are shown in table 3, as follows: (See Table-3)

**Intelligence** : In order to measure intelligence of students, Samoochik Mansik Yogyata Pariksha constructed by Dr. R. K. Tandon (1973) was used. It is a verbal group test in Hindi. It contains 100 questions, four to five alternatives to the questions have been provided to make the scoring objective and fool-proof. The hundred items have been distributed over nine

subtests, namely, Number series, Mathematical Instructions, Following Instructions, Vocabulary Similar, Vocabulary Similar, Vocabulary Opposites, Classifications, Best Answers, Analogies and Reasoning. All the items have been arranged in increasing order of difficulty in the test.

**Table No. 3- Dimensions of SOLAT TOOL**

S.No.	Dimensions	Items
<b>I. Learning Styles :</b>		
1.	Verbal	1 to 5 items
2.	Content preference	6 to 10 items
3.	Class Preference	11 to 15 items
4.	Learning preferences	16 to 20 items
5.	Interest	21 to 25 items
<b>II. Thinking Styles :</b>		
6.	Logical/Fractional	26 to 30 items
7.	Divergent/Convergent	31 to 35 items
8.	Creativity	36 to 40 items
9.	Problem solving	41 to 45 items
10.	Imagination	46 to 50 items

**Procedure of Data Collection** : The necessary data were collected by administering the tools described in table no.4 Collected data were analyzed with the help of different statistical techniques.

**Statistical Techniques Used** : The obtained data were analyzed by using the following statistical techniques: 1. Chi-Square was used to study the relationship between different learning and thinking styles and intelligence of girls’ students. 2. Chi-Square was used to study the relationship between different learning and thinking styles and intelligence of boys’ students. 3. Mean, S.D., t-test were used to study the relationship between right and left cerebral hemisphere of the girls’ and boys’ students belonging to high and low intelligence groups.

**Results and Discussions** : The obtained results are as follows: (See Table-4)

Table No. 4 shows the Chi-Square values of hemispherical preference and intelligence of different learning and thinking styles of Higher secondary girls’ students. The Chi-Square values of four learning styles (Verbal, Content-preference, Class-preference, and Learning-preference) are not found significant at 0.05 level of confidence. Hence the hypothesis of no relationship between hemispherical preference of four learning styles (Verbal, Content-preference, Class-preference, and Learning-preference) and intelligence of girls’ students is accepted. Values of Chi-Square show no significant relationship between these learning

styles & intelligence of girls' students. While Chi-Square values of one learning style (Interest) and intelligence is significant at 0.05 level of confidence but not at 0.01 level of confidence. Hence, the hypothesis of relationship between hemispherical preference of learning style (Interest) and intelligence of girls' students is rejected. Value of Chi-Square (Learning style-Interest) shows significant relationship among hemispherical preference of learning style (Interest) and intelligence of girls' students.

**Table No. 4 -Chi-Square Values for Hemispheric Preference of Learning and Thinking Styles of High and Low Intelligent Girls' Students**

girls' students is accepted. Values of Chi-Square show no significant relationship between thinking styles and intelligence among girls' students.

**Table No. 5 -Chi-Square Values for Hemisphere Preference of Learning and Thinking Styles of High and Low Intelligent Boys' Students**

Sr. No.	Dimensions	Hemispherical Pref.	Intelli.Groups		C.-S. Value
			High	Low	
<b>Learning Style:</b>					
1.	Verbal	Right Hemisphere	14	14	0.0092*
		Left Hemisphere	22	21	
2.	Content-Preference	Right Hemisphere	13	12	0.0259*
		Left Hemisphere	23	23	
3.	Class-preference	Right Hemisphere	10	8	0.0415*
		Left Hemisphere	26	27	
4.	Learning-preference	Right Hemisphere	27	18	3.2934*
		Left Hemisphere	9	17	
5.	Interest	Right Hemisphere	23	27	2.2006*
		Left Hemisphere	13	8	
6.	Logic/Fractional	Right Hemisphere	25	22	0.3441*
		Left Hemisphere	11	13	
7.	Divergent/Convergent	Right Hemisphere	21	19	0.1182*
		Left Hemisphere	15	16	
8.	Creative	Right Hemisphere	21	22	0.1521*
		Left Hemisphere	15	13	
9.	Problem solving	Right Hemisphere	18	21	0.7168*
		Left Hemisphere	18	14	
10.	Imagination	Right Hemisphere	26	20	1.7689*
		Left Hemisphere	10	15	

Note: \*Not significant at 0.05 level of confidence.

Table No. 5 shows the Chi-square values of hemispherical preference and intelligence of different learning and thinking styles of boys' students. The Chi-Square values of different learning styles (Verbal, Content-preference, Class-preference, Learning-preference, Interest) and thinking styles (Logic/Fractional, Divergent/Convergent, Creative, Problem Solving, Imagination) and intelligence are not found significant at .05 level of confidence. Hence the hypothesis of no relationship between hemispherical preference of learning and thinking styles (Verbal, Content-preference, Class-preference, Learning-preference, Interest, Logic/Fractional, Divergent/Convergent, Creative, Problem Solving, and Imagination) and intelligence of boys' students is accepted. Values of Chi-Square show no significant relationship between learning/thinking styles and intelligence boys' students. Difference in mean scores of Intelligence of Right and Left Hemispherical groups.

Note: (1) \* not significant at .05 level of confidence.

(2) \*\* Significant at .05 level of confidence but not at .01 level of confidence.

The Chi-Square values of different thinking styles (Logic/Fractional, Divergent/Convergent, Creative, Problem Solving, and Imagination) and intelligence are not found significant at 0.05 level of confidence. Hence the hypothesis of no relationship between hemispherical preference of thinking styles (Logic/Fractional, Divergent/Convergent, Creative, Problem Solving, and Imagination) and intelligence of

**Table No.6-Different in Mean Scores of Intelligence of Right and Left Hemispherical Groups.**

No	Intelligence Gr.	Hemisp. Preference	N	Mean	S.D.	't'-Value
<b>n granted school.</b>						
	High Intelligence	Right Hemisphere	18	35.722	5.004	2.1076**
		Left Hemisphere	12	32	4.553	
	Low Intelligence	Right Hemisphere	14	22	4.038	1.0968*
		Left Hemisphere	15	20.6	2.64	
<b>anted school :</b>						
	High Intelligence	Right Hemisphere	19	32.789	3.343	0.7003*
		Left Hemisphere	17	31.941	3.864	
	Low Intelligence	Right Hemisphere	24	21.25	4.110	1.5661*
		Left Hemisphere	11	23.18	2.994	

Note: (1) \* not significant at 0.05 level of confidence.

(2) \*\* Significant at 0.05 level of confidence but not at 0.01 level of confidence. It is evident from table no. 6: (1) That hemispherical difference emerged as significant at .05 level of confidence with df. 28 among high intelligent group of higher secondary girls' students. Hence, hypothesis of no relationship is rejected. It implies that right and left hemisphere oriented students were not similar. So there is significance difference among learning and thinking style preferences. (2) That no hemispherical difference emerged as significant at 0.05 level of confidence with df. 27 among low intelligent group of higher secondary girls' students. Hence, hypothesis of no relationship is accepted. It implies that right and left hemispherical oriented girls' students belonging to low intelligent groups were almost similar. So, there is not significance difference among learning and thinking style preferences. (3) That no hemispherical difference emerged as significant at 0.05 level of confidence with df. 34 among high intelligent group of higher second-

ary boys' students. Hence hypothesis of no relationship is accepted. It implies that right and left hemispherical oriented boys' students belonging to high intelligent groups were almost similar. So there is no significance difference. (4) That no hemispherical difference emerged as significant at 0.05 level of confidence with df. 33 among low intelligent group of higher secondary boys' students. Hence, hypothesis of no relationship is accepted. It implies that right and left hemispherical oriented boys' students belonging to low intelligent groups were almost similar. So there is no significance difference.

**Conclusion :** On the basis of findings of the study it may be concluded that: (1) There is no significant relationship between learning style (except interest) and intelligence of girls' students while relationship between one learning style (Interest) and intelligence is found significant. (2) There is no significant relationship between thinking style and intelligence among girls' students. (3) There is no significant relationship between learning and thinking style and intelligence among boys' students. (4) There is no significant relationship between right and left hemispherical oriented girls' students belonging to high intelligence group. (5) There is no significant relationship between right and left hemispherical oriented girls' students belonging to low intelligence group. (6) There is no significant relationship between right and left hemispherical oriented boys' students belonging to high intelligence group. (7) There is no significant relationship between right and low hemispherical oriented boys' students belonging to low intelligence group.

**R E F E R E N C E**

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