

MULTIPLE INTELLIGENCES OF HIGH SCHOOL STUDENTS WITH SPECIAL REFERENCE TO GENDER

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Abstract

Howard Gardner defined intelligence as “The capacity to solve problems or to make new trend products that are evaluated in one or more cultural setting”. Some research showed that multiple intelligences and achievement are related. Many research study examined the relationship between multiple intelligence and achievement with special reference to gender. The findings of those research is there is a significance difference in the means scores of multiple intelligence between the groups of school students with respect to gender. In this study the researcher adopted the descriptive survey method of study. The population of the study is high school students studying in ninth standard. The researcher used simple random technique in this study. The study concludes that there is a significance difference in the means scores of multiple intelligence between the groups of high school students with special reference to gender among the dimensions of multiple intelligences and also there is a positive correlation among the dimension of multiple intelligences.

Key Words: multiple intelligence; Linguistic intelligence; Logical-mathematical intelligence; Spatial intelligence; Musical intelligence; Bodily-kinaesthetic intelligence; Interpersonal intelligence; Intrapersonal intelligence; Naturalistic Intelligence; Humanistic Intelligence and Moral Intelligence.

Introduction

Education is something that is provided by an external force as a teacher, tutor or parent. Education helps us to develop our natural intelligence in different ways. Many people have abilities in different areas that are made to shine, when they receive education. Others do not receive the right type of education and their abilities lie latent within them. The curriculum to be followed by a student is determined by the concerned nation or authorities. It also depends upon the resources available and the capacity of the students as well as the overall goals of both the society and the individuals. In the case of each student, those who plan education must decide which means is the best to help him to attain a desired competence or skill. In the case of a highly talented student it is sufficient to enable him to work directly with materials that he can explore. In the case of a student who has less abilities, it will be necessary to device special methods, mechanisms and means to exploit the intellectual capacities he has.

Multiple intelligence

The followers of Lev Vygotsky believe “at each age children show different set of interests. At the age of infancy prime actions involves emotional connections with others. At the age of two the child shows more interaction with handling of objects its manipulation. During the age from three to seven they will engage in role play and symbolic

activities. During the age from seven to eleven formal studies in school and in adolescences they engage in personal relations and carrier oriented activities. Educational program should keep these biases in mind. This profile of interest differs significantly across culture” (Vygotsky, 1978).

Howard Gardner considered intelligences as “the capacity to solve problems or to make new trend products that are evaluated in one or more cultural setting”. He recapitulated the theory of intelligence using eight criteria. According to Gardner, “there are biological and cultural bases for intelligences. Neurobiological research indicates that learning is an outcome of the modifications in the form of connections between cells. Primary elements of different types of learning are found in particular areas of the brain the corresponding transformations occurring there (Gardner, 2004).”

Various types of learning result in the cell connections among different areas of the brain. Different cultures results in various types of intelligences. Different culture and cultural context play good roles in the formation of intelligence. A child’s ability to perform certain tasks depends upon his cultural value. This cultural value helps to get motivation for acquiring skills in concerned areas. Therefore, certain intelligences might be highly developed in people of one culture. The same intelligences might not be so well developed in the individuals of another culture (Gardner, 2004).

Howard Gardner defined intelligence as “The capacity to solve problems or to make new trend products that are evaluated in one or more cultural setting”. He reviewed the theory of intelligence using eight criteria. Gardner developed an optimal taxonomy of human capacities. These human capacities are called “Multiple Intelligences. This is a spectrum of human abilities which are included in the concept of intelligence. Gardner proposed a combination of ten different abilities they are; 1) Linguistic intelligence; 2) Logical-mathematical intelligence; 3) Spatial intelligence; 4) Musical intelligence; 5) Bodily-kinaesthetic intelligence; 6) Interpersonal intelligence; 7) Intrapersonal intelligence; 8) Naturalistic Intelligence; 9) Humanistic Intelligence and 10) Moral Intelligence.

Multiple intelligence and academic achievement

Some research showed that multiple intelligences and achievement are related. (Gardner, 2004). Gardner recently has added three new intelligences, Naturalistic intelligence, Humanistic and Moral Intelligence. In the ancient times intelligence was used as a single capacity. Gardner identified these intelligences through a study on the development of cognitive skills of normal children, stroke patients and other brain damaged ones (Gogabakan, 2003).

According to Gardner (2006) “multiple intelligences theory has had a considerably important impact upon the whole world of education”. Actually Gardner never thought of any application of Multiple Intelligences theory in educational situations. He developed his theory of multiple intelligences with a goal of getting well advances in the fields of neuroscience, biology, and psychology. His effort was the formation of an alternate way of thinking about human cognition. Numerous educators welcomed the idea of multiple intelligences. Thousands of school teachers and researchers in many different countries have applied multiple intelligences theory in the field of education. It is clear that multiple intelligences theory can be used to identify children’s relative strength and profile of intelligences.

All the above mentioned purposes are for acquiring better achievement for students. A student's achievement in different subjects depends upon the level of their learning capacity. This learning capacity will vary in different students. Also a student may be bright in one subject may not be so bright in other subjects. Which factor makes this possible? The level of achievement is an indication of his capability to grasp things. So achievement is the action of accomplishing something. Level of attainment in any subject, is estimated by performance on a test. So level of attainment of mathematics skills is estimated by mathematics performance test or mathematics achievement test.

Multiple Intelligences and Gender Differences

Batulayan (2001) "Relationship between multiple intelligences and academic achievement of grade six pupils in Northern Luzon Mission. Gender among the grade six pupils does not confine one to a certain specific intelligence. The study found that male and female participants in the study did not have significant correlations in the multiple intelligences".

Gogabakan, (2003) studied about "How students' multiple intelligences differ in term of grade level and gender'. When results are examined in terms of gender, it can be said that the male students' logical-mathematical and bodily kinesthetic intelligence were higher than female students' whereas the female students' musical intelligence was higher than male students."

Asha (2007) studied about the interrelationship of different dimensions of multiple intelligences among secondary school students. The investigator found that there were no differences among the dimensions of multiple intelligences based on gender except for Linguistic intelligence and Musical intelligence.

Ebru and Akyol (2007) showed that the type institution and gender differences make changes in the development of linguistic intelligence, musical Intelligence and bodily kinaesthetic intelligence. Musical Intelligence of the girls was higher than that of boys. The bodily-kinaesthetic intelligence of the boys was higher than that of the girls.

Nasser, R., Singhal, S. and Abouchdid, K., (2008) conducted a study on a sample of 648 Lebanese and 252 Indian students estimated their multiple intelligences based on Gardner's conceptualization. Males rated on the bodily kinesthetic component higher than females while females estimated their verbal and intra - personal intelligence higher than males. Differences appeared between Indian and Lebanese samples on the cognitive components, namely, verbal, spatial and logical abilities. Using the educational level of the parent as a covariate, significant differences were found between the Indian and Lebanese sample on verbal, spatial, and logical abilities. Interaction effects of gender and nationality were observed on the logical component. While Lebanese males rated the logical component higher than the Lebanese females, Indian females rated the logical component higher than their male counterparts but lower than the male and female Lebanese students.

Jeba and Annaraja (2008) also examined the relationship between multiple intelligence and achievement in chemistry among high school students. Findings of the study were (I) there was no significant difference in multiple intelligence and achievement by their gender, type of school and locality and (ii) There was no significant- relationship

between multiple intelligence and achievement.

Shanthy and Amaladoss (2009) conducted a study on relationship between multiple intelligence and achievement in physics of college students. Findings of the study were (i) there was no significant difference between gender and multiple intelligences (ii) there was a significant difference between gender, medium of instruction, locality and achievement in physics.

Micheal Leo and Venkatesh (2009) conducted a study on relationship between multiple intelligence and academic achievement in biology of XI standard students. Findings of the study were (i) no significant difference by their gender, medium of instruction, locality, type of school and religion and community in their multiple intelligences. (ii) There was a significant difference in gender, medium, and locality, type of school and community of academic achievement. (iii) There was no relation between in total and multiple intelligence and achievement of total sample and female; but there was a relation between in total and multiple intelligence and achievement.

Shajini (2010) examined the relationship between musical intelligence and achievement in mathematics of high school students. The findings of the study revealed that there was no significant relationship between musical intelligence and achievement in mathematics of high school students. It was found that there was no significant relationship between male and female high school students in their musical intelligence and achievements in mathematics.

Need and Significance of the Study

Many students in high schools are “stressful”. “Students divert the effects of their stress in harsh and negative ways”. Children of secondary classes (age from 12 - 15 years) are more strongly activated by negative feedback and much less by positive feedback. It is a period of stress and strain. This is an age with tremendous energy flowing in the body. They should properly use this energy for the sake of themselves and for the society in which they live (**Mubeenakhan, 2012**) allow students for the formation of learning objectives to fulfill their intelligence strengths. It also makes the students feel that they have control over their learning. After teaching a lesson, give a difficult project to show mastery level of the learning objective. Give students a list of several activities from which they can choose. Allow them to determine which project they would like to complete. Activities can be construction or designing something, creating a play or story, drawing a picture or sketch, writing an essay or writing a song. Teachers knew that students have different strengths and weaknesses inside the classroom. Gardner’s research throws light along the direction how to improve a student’s ability according to their intelligence. Teachers were encouraged to prepare lesson plans that meet the needs of different components of Multiple Intelligences. Hence the investigator decided to conduct a study based on multiple intelligences and academic achievement.

Title of the Study

The present study entitled as “**Multiple Intelligences of High School Students with Special Reference to Gender**”

Objectives of the Study

The following are the objectives of the study

1. To find out the multiple intelligences among the high school students.
2. To find out the significant difference between the multiple intelligences and demographic variables among the high school students.
3. To find out the correlation among the dimension of multiple intelligences of high school students.

Hypotheses of the Study

The following are the hypotheses of the study

1. There is no significant difference in the mean scores of verbal intelligence between the groups of high school students with regard to gender.
2. There is no significant difference in the mean scores of logical intelligence between the groups of high school students with regard to gender.
3. There is no significant difference in the mean scores of visual intelligence between the groups of high school students with regard to gender.
4. There is no significant difference in the mean scores of kinesthetic intelligence between the groups of high school students with regard to gender.
5. There is no significant difference in the mean scores of musical intelligence between the groups of high school students with regard to gender.
6. There is no significant difference in the mean scores of interpersonal intelligence between the groups of high school students with regard to gender.
7. There is no significant difference in the mean scores of intrapersonal intelligence between the groups of high school students with regard to gender.
8. There is no significant difference in the mean scores of naturalistic intelligence between the groups of high school students with regard to gender.

Limitation of the Study

The investigator tried to conduct the study as accurate as possible, however some limitations may have grassed into the study. 1. The investigator has selected the sample from Tiruchirappalli district only. 2. It is assumed that the students have nearly the same background in terms of their parents' level of education and socioeconomic status. 3. The sample size selected by the investigator was only 300. If a large sample from all the districts of Tamil Nadu were considered, more detailed result would have obtained. 4. The study was based on the secondary school students, but the investigator took only IX Standard for his study.

Research Method

Methodology is a process, which reveals that all those methods and techniques used by the researcher during the execution of research work. The study was conducted through descriptive method of research. The survey method has the steps of planning, development and application of sampling plan, construction of questionnaire, translation of data, analysis, conclusion and reporting.

Population

The investigator has tried as far as possible all care to ensure that the sample of this research study becomes a true representative. The population for the present study is consists of 300 (2018 -2019) IX standard students are studying in the secondary classes in Tiruchirappalli district.

Sample and Sampling Technique

The sample for the present study has been identified as the students, in Tiruchirappalli district of Tamil Nadu. For the selection of sample, the researcher collected the details of all the schools in this district. Using simple random procedure from the list of schools the researcher identified 5 schools from Tiruchirappalli district. The sample has been further limited to the 300 high school students who are studying at the high school students who are in 9th standards.

Tools Used for the Study

The following tool were selected and used by the investigator in the present study:

1) The tool on learning styles scale was developed and standardized by Ahila Ruby Shantha Kumari, V. (2015) and re-validated by the investigator.

Multiple Intelligences Inventory

Multiple Intelligences are an array of different kinds of Intelligences. Gardner identified and introduced seven different kinds of intelligences, namely: Verbal Linguistic Intelligence: a sensitivity to the meaning and order of words, Logical Mathematical Intelligence: ability in Mathematics and other complex logical systems, Visual – Spatial intelligence: the ability to “think in pictures” to perceive the virtual world accurately and recreate [after] it in the mind or on paper, Bodily-Kinaesthetic Intelligence: the ability to use one’s body in a skilled way, for self-expression or toward a goal, Musical-Rhythmic Intelligence: the ability to understand and create music, Interpersonal Intelligence : an ability to perceive and understand other individuals-their moods, desires and motivation. Intrapersonal Intelligence: an understanding of one’s own emotions, Naturalistic Intelligence: understanding of nature, nurturing and classification etc. These intelligences are inherent in human beings, by the support of which they perceive, understand and relate to every aspect in life, which will be tested using Multiple Intelligences scales constructed by the researcher.

The adapted inventory consists of 80 statements. Against each statement, there are three alternatives. They are (1) Always; (2) Sometimes; (3) Never. The respondent can choose any one of the three alternatives for each statement indicating how well that statement describes the respondent. The investigator pooled all the 80 statements fall into eight dimensions of multiple intelligences. The item distribution of Multiple Intelligence Inventory is given below:

Table 1 Dimensions of Multiple Intelligence Inventory

S. No.	Dimensions	Statements	No. of Items
1	Verbal Linguistic Intelligence	1 – 10	10
2	Logical/Mathematical Intelligence	11 – 20	10
3	Visual/Spatial Intelligence	21 – 30	10
4	Bodily/Kinesthetic Intelligence	31 – 40	10
5	Musical/Rhythmic Intelligence	41 – 50	10
6	Interpersonal Intelligence	51 – 60	10
7	Intrapersonal Intelligence	61 – 70	10
8	Naturalistic Intelligence	71 – 80	10
	Total		80

Scoring

For each statement corresponding to (1) Always; (2) Sometimes; (3) Never, and the scoring / the mark allotment is 3, 2 and 1 respectively.

Procedure of Data Collection

The investigator with the permission of the heads of schools and the cooperation of the concerned teachers administered the tools to the high school students. The area of investigation is Tiruchirappalli district. The investigator approached the principals / headmasters of the institutions and got their co-operations insured. The questionnaire, multiple intelligences inventory along with general data sheet were administered on high school students after explaining the purpose of the study. The scores of the tools were calculated and were tabulated with other relevant data. The data were entered in a suitable manner so that they could be used for computer data processing.

Statistical Techniques for Data Analysis

The Statistical Package for the Social Sciences (SPSS) version 20.0 was used to analyse the collected data and all the hypotheses were tested at 0.05 and 0.01 levels of significance.

Analysis and Interpretations of the Data Hypotheses Testing

Table – 2 Test of significance difference in the mean scores of verbal intelligence, logical intelligence, visual intelligence, kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal intelligence and naturalistic intelligence between the groups of high school students with regard to gender

Background Variables		N	Mean	SD	t – value	Level of Significance
verbal intelligence	Boys	124	21.7016	2.30581	1.199	Significant
	Girls	176	22.0341	2.45391		
logical intelligence	Boys	124	21.4355	2.58590	2.887	Significant
	Girls	176	22.3011	2.51741		
visual intelligence	Boys	124	21.8065	2.50423	2.782	Significant
	Girls	176	22.6307	2.55789		
kinesthetic intelligence	Boys	124	22.2258	2.35762	0.985	Not Significant
	Girls	176	22.5114	2.62948		
musical intelligence	Boys	124	21.7742	3.28792	0.835	Not Significant
	Girls	176	21.4489	3.37007		
interpersonal intelligence	Boys	124	22.0000	2.52145	3.138	Significant
	Girls	176	22.9261	2.51173		
intrapersonal intelligence	Boys	124	22.9032	2.42420	0.152	Not Significant
	Girls	176	22.8580	2.69756		
naturalistic intelligence	Boys	124	22.6774	2.49731	0.570	Not Significant
	Girls	176	22.8523	2.78174		

1) From the above table shows that the obtained 't' value (1.199) is greater than the table value (1.97) at 0.05 level. It is clear that there is a significant difference between the

boys and girls high school students in their verbal intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of verbal intelligence between the groups of high school students with regard to gender” is rejected. The girl high school student’s verbal intelligence mean scores is higher than the boy students.

2) From the above table shows that the obtained ‘t’ value (2.887) is greater than the table value (1.97) at 0.05 level. It is clear that there is a significant difference between the boys and girls high school students in their logical intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of logical intelligence between the groups of high school students with regard to gender” is rejected. The girl high school student’s logical intelligence mean scores is higher than boy students.

3) From the above table shows that the obtained ‘t’ value (2.782) is greater than the table value (1.97) at 0.05 level. It is clear that there is a significant difference between the boys and girls high school students in their visual intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of visual intelligence between the groups of high school students with regard to gender” is rejected. The girl high school student’s visual intelligence mean scores is higher than boy students.

4) From the above table shows that the obtained ‘t’ value (0.985) is less than the table value (1.97) at 0.05 level. It is clear that there is no significant difference between the boys and girls high school students in their kinesthetic intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of kinesthetic intelligence between the groups of high school students with regard to gender” is accepted. The girl high school student’s kinesthetic intelligence mean scores is higher than boy students.

5) From the above table shows that the obtained ‘t’ value (0.835) is less than the table value (1.97) at 0.05 level. It is clear that there is no significant difference between the boys and girls high school students in their musical intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of musical intelligence between the groups of high school students with regard to gender” is accepted. The boy high school student’s musical intelligence mean scores is higher than girl students.

6) From the above table shows that the obtained ‘t’ value (3.138) is greater than the table value (1.97) at 0.05 level. It is clear that there is a significant difference between the boys and girls high school students in their interpersonal intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of interpersonal intelligence between the groups of high school students with regard to gender” is rejected. The girl high school student’s interpersonal intelligence mean scores is higher than boy students.

7) From the above table shows that the obtained ‘t’ value (0.152) is less than the table value (1.97) at 0.05 level. It is clear that there is no significant difference between the boys and girls high school students in their intrapersonal intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of intrapersonal intelligence between the groups of high school students with regard to gender” is accepted. The boy high school student’s intrapersonal intelligence mean scores is higher than girl students.

8) From the above table shows that the obtained ‘t’ value (0.570) is less than the table value (1.97) at 0.05 level. It is clear that there is no significant difference between the boys

and girls high school students in their naturalistic intelligences. Hence, the stated null hypothesis “There is no significant difference in the mean scores of naturalistic intelligence between the groups of high school students with regard to gender” is accepted. The girl high school student’s naturalistic intelligence mean scores is higher than boy students.

Hypothesis – 9 There is no significance correlation among the dimension of multiple intelligences of high school students.

Table – 3 Test of significance correlation among the dimension of multiple intelligences of high school students.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Verbal Intelligence (1)	Pearson Correlation	1	.307**	.386**	.363**	.277**	.335**	.431**	.264**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	300	300	300	300	300	300	300	300
Logical Intelligence (2)	Pearson Correlation	.307**	1	.372**	.430**	.040	.334**	.403**	.392**
	Sig. (2-tailed)	.000		.000	.000	.490	.000	.000	.000
	N	300	300	300	300	300	300	300	300
Visual Intelligence (3)	Pearson Correlation	.386**	.372**	1	.367**	.207**	.379**	.447**	.374**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
	N	300	300	300	300	300	300	300	300
Kinaesthetic Intelligence (4)	Pearson Correlation	.363**	.430**	.367**	1	.121*	.440**	.485**	.403**
	Sig. (2-tailed)	.000	.000	.000		.036	.000	.000	.000
	N	300	300	300	300	300	300	300	300
Musical Intelligence (5)	Pearson Correlation	.277**	.040	.207**	.121*	1	.239**	.263**	.292**
	Sig. (2-tailed)	.000	.490	.000	.036		.000	.000	.000
	N	300	300	300	300	300	300	300	300
Interpersonal Intelligence (6)	Pearson Correlation	.335**	.334**	.379**	.440**	.239**	1	.490**	.371**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000
	N	300	300	300	300	300	300	300	300
Intrapersonal Intelligence (7)	Pearson Correlation	.431**	.403**	.447**	.485**	.263**	.490**	1	.523**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
	N	300	300	300	300	300	300	300	300
Naturalistic Intelligence (8)	Pearson Correlation	.264**	.392**	.374**	.403**	.292**	.371**	.523**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	300	300	300	300	300	300	300	300
**. Correlation is significant at the 0.01 level (2-tailed).									
*. Correlation is significant at the 0.05 level (2-tailed).									

From the above table shows that there is a significant positive correlation between the dimension of multiple intelligences among the high school students with special references to

gender. Hence, the stated null hypothesis “There is no significance correlation among the dimension of multiple intelligences of high school students” is rejected.

Major Findings of the Study

The following are the major findings of the study

1. There is a significant difference in the mean scores of verbal intelligence between the groups of high school students with regard to gender.
2. There is a significant difference in the mean scores of logical intelligence between the groups of high school students with regard to gender.
3. There is a significant difference in the mean scores of visual intelligence between the groups of high school students with regard to gender.
4. There is no significant difference in the mean scores of kinesthetic intelligence between the groups of high school students with regard to gender.
5. There is no significant difference in the mean scores of musical intelligence between the groups of high school students with regard to gender.
6. There is a significant difference in the mean scores of interpersonal intelligence between the groups of high school students with regard to gender.
7. There is no significant difference in the mean scores of intrapersonal intelligence between the groups of high school students with regard to gender.
8. There is no significant difference in the mean scores of naturalistic intelligence between the groups of high school students with regard to gender.
9. There is a significance correlation among the dimension of multiple intelligences of high school students.

Recommendations of the Study

On the basis of findings, the investigator has given the following recommendations:

1. This study suggests that all the selected components of multiple intelligences are present in high school students in Tiruchirappalli district of Tamil Nadu in diverse form. So those who lack some components of multiple intelligences must be given special training for attaining more ability.
2. The study shows that the need of giving special programmes inculcating multiple intelligences in boys. So programmes should be conducted for inculcating interpersonal intelligence among boys. Various community programs like interschool debates, interschool seminars and state seminars are to be implemented in schools and encourage the students to participate in these.
3. The study suggests that the components of multiple intelligences have positive correlation among high school students. So, teachers of all subjects should take necessary steps to make these students more alert in using multiple intelligences. So initiatives should be taken to impart an optimum level of multiple intelligences to the students.
4. Special workshops and classes of experts should be arranged in the subject of psychology especially in the branch of multiple intelligences for the school students and teachers.
5. Parents also should be aware of their children’s tendency and dominant character of their intelligences.

Conclusion

The present study concluded that there are average levels of all the eight dimensions of multiple intelligences found in the high school students with special reference to gender. The differential analysis revealed that there are some significant differences in the

dimensions of multiple intelligences in the sample selected for the present study. The correlation analysis revealed that there are significant correlation between the dimensions of multiple intelligences. Hence, it is quite clear that the dimensions multiple intelligences should properly be inculcated or improved in the high school students to achieve more and more in the academic achievement and life success. An earnest effort should be made by the practioners to change the curriculum to a certain level at least and be redesigned according to the Multiple Intelligence theory.

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