

A correlation study of multiple intelligence and school achievement at primary level

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Abstract:

The study explored the relationship of multiple intelligences to the academic achievement of primary level students of Anand town. Data were obtained from 97 students who were enrolled for the 2014 – 15 in the primary schools of Anand city. Participants responded to the standardized Multiple Intelligences inventory (MII), a developed by Prof. K. S. Likhia, which was personally administered by the researcher. It contains 35 items with 7 questions each representing the seven intelligences namely: verbal-linguistic, logical-mathematical, bodily-kinesthetic, musical, visual-spatial, intrapersonal and interpersonal. The statistical analyses of the study employed Pearson correlation. Findings from this study suggest that in a learning environment where multiple intelligences may not be actively used, there is a tendency to have weak and negative correlation between multiple intelligences and different subjects academic achievement.

Key words: Multiple intelligences (MI), academic achievement.

Introduction:

*“All students can learn and succeed, but
Not all on the same day in the same way”
-William G. Spady*

Multiple Intelligences (MI) Theory is one of the most compelling approaches to education. The ideas inherent in multiple

intelligence theory were proposed in the early 1980s by Gardner in which he suggests that "the traditional notion of intelligence as measured by I.Q testing is far too limited, and there are not just two ways to be intelligent, but many ways"(Gardner, 1983, p.51). According to this theory, people are different in their different aspects of intelligence. This difference causes differences in people's performance on different tasks, as well as different aspects of a special task. The heart of MI theory rests on individualization and recognition of divergent abilities and personal differences. Gardner, viewed "intelligence as the ability to solve problems or to create products that are valued in one or more cultural setting". (Gardner & Hatch, 1989, pp. 4-9). This definition challenged the traditional psychological view of intelligence as a single capacity that drives logical and mathematical thought He asserts that the intelligences are eight types and they are not meant to be reflections of emotions, personality or sensory acuity, rather, each of the intelligence considered computational capacity the ability to process certain kinds of information in the process of solving a problem or fashioning a product. Academic achievement is dependent upon and academic intelligence and MI of the learner. Demographic variation plays a very important role in determining human behavior, through this study an attempt was made to uncover the role of demographic variable as gender in determining the level of academic achievement and the relationships with multiple intelligence.

Research review:

Campbell & Campbell (1999) assert that Gardner's theory of multiple intelligences also serves to correct negative, implicit beliefs of the teacher that diminish expectations and weaken student achievement. In his book, *Becoming A Multiple Intelligences School*, Thomas R. Hoerr contends that employing

multiple intelligences in the classroom not only gives a diverse group of students greater opportunities to learn, but it also provides teachers and administrators with a greater means of personal and professional growth (2000). There appears to be limited focused research syntheses which address the relationship of multiple intelligence instructional approaches and student achievement indicators within the setting of secondary school classrooms. Onika et al. (2008) studied the effects of the MI teaching strategy on the academic achievement. The results suggested that performance on a post mathematics assessment for students exposed to MI showed considerable increase when compared to those taught using direct instruction. Abdallah and Mahmoud (2008) in the study "Multiple ways to be smart: Gardner's theory of MI and its educational implications in English teaching and oral communication" highlighted the educational applications and implications of MI theory in English language teaching. Gaines and Lehmann (2002) conducted a study and found that the use of MI strategies improved the students' reading comprehension ability and it enhanced their academic performance as well. Pociask and Settles (2007) studied whether use of MI theory influenced student engagement and academics. Researchers found a dramatic decrease in inappropriate behaviours and an increase in students' motivation towards learning, improved self-esteem, and higher retention rates. Parents reported that their children were more willing to share their learning experiences because of their improvement in the classroom. The results of the study done by Ozdemir (2006) provided evidence that student learning is enhanced through MI instruction. The students were more involved during the instruction; they gained more insights, and self efficacy. Hearne and Stone (1995) pointed out that, unlike primary schools, secondary schools are in the position of having specialist teachers of art, music, drama, dance and physical education, who can help other teachers to integrate these disciplines into traditional

academic subject areas. IKiz and Çakar (2010) studied the relationship between multiple intelligences and the academic achievement levels. Academic achievement scores turned out to be related to students' multiple intelligences. Results also contribute awareness to the self knowledge and self-efficacy of the students and to developing programs to improve their academic achievement. Carroll, et al., (2009) examined the structural relations among self-efficacy, and academic aspirations. The results showed that academic self-efficacy and self-regulatory efficacy had a strong relationship with academic achievement. However, a negative relationship between social self-efficacy and academic achievement was reported. According to Newby-Fraser and Schlebusch (1997), self-efficacy has a significant negative correlation with level of stress. However, Nikoopour, et al., (2012) concluded that all subcontracts of trait EI were moderate predictors of self-efficacy. In an attempt to investigate the effect of emotional intelligence and self-efficacy beliefs on high school students' achievement, Yazici, Seyis and Altun (2011) found gender, age and self-efficacy as the major predictors of learners' academic achievement. Young (2003) suggested a new approach to improving mathematics achievement by the integration of MIT and self-efficacy theory. He claimed that learning through intellectual strengths increases students' mathematics achievement both directly from their increased understanding and indirectly by raising students' self-efficacy for mathematics.

Objective of the study:

1. To find the measure level of multiple intelligence of upper primary school students.
2. To study the correlation between multiple intelligence and academic achievement.
3. To study the correlation between multiple intelligence and academic achievement in the context of gender.

The area of the present research is the intelligence and sub-area is intelligence. Also present research is the operational type research as well as correlation quantitative research.

Hypothesis of the study:

H₀₁: There will be no linear relation between multiple intelligence and academic achievement of total students.

H₀₂: There will be no linear relation between multiple intelligence and academic achievement of girls.

H₀₃: There will be no linear relation between multiple intelligence and academic achievement of boys.

Limitations of the study:

This study limited to the Anand city only (Gujarat state).The student of standard 5 of Gujarati medium school. Continuous variable multiple intelligence and academic achievement, discrete variable was gender. Here standard 5 students was controlled variable.

Method

Participants:

For present study researcher select anand city. The total students of school of upper primary of anand city were the population. The sample was selected by randomly. A researcher was select randomly one school and out of total classes randomly selects two classes. Total sample was 97. Out of them 60 boys and 37 girls. (The age group of the student was 10 to 11.)

For solve the problem of the study, researcher use correlation techniques from descriptive type research.

Instrument: For the study the measurement of multiple intelligence, simple multiple intelligence inventory (MII) developed by prof.K.S.Likhia. It measured seven dimensions of Gardner’s MI theory. It comprised a set of 35 statements with 5 statements for assessing each of the intelligences. For the measurement of academic achievement the result of last semesters were taken as a students’ achievement score.

Procedure: Prof. K. S. Likhia’s MII was administered on 97 participants. The participants were required to complete inventory by choosing among 4 alternatives, ranging from strongly agree to strongly disagree. For strongly agree give 4 and strongly disagree give 1.maximum scores will be 20 and minimum scores 5 of each intelligence. Total scores on each subscale MII is called MII of the students. Also academic achievement of the students collected from the schools. Both scores were continuous type data. To find correlation researcher use person’s correlation techniques.

Result and discussion

Table 1: Results of descriptive statistics of intelligence type of multiple intelligence:

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
					Statistic	Std. Error			Statistic	Std. Error	Statistic	Std. Error
LINGUISTIC	97	8.00	10.00	18.00	14.0412	.15981	1.57399	2.477	.062	.245	-.249	.485
MATHEMATICAL	97	12.00	8.00	20.00	15.1031	.26803	2.63978	6.968	-.440	.245	.051	.485
MUSICAL	97	11.00	9.00	20.00	14.4330	.27138	2.67281	7.144	.298	.245	-.648	.485
BODILY- KINESTHETIC	97	9.00	11.00	20.00	16.5567	.21185	2.08651	4.354	-.401	.245	-.468	.485
SPATIAL	97	10.00	8.00	18.00	13.5258	.21692	2.13645	4.564	-.478	.245	.202	.485
INTERPERSONAL	97	9.00	11.00	20.00	15.5464	.23677	2.33194	5.438	.174	.245	-.637	.485
INTRAPERSONAL	97	15.00	5.00	20.00	12.7938	.29925	2.94724	8.686	.139	.245	-.281	.485
Valid N (list wise)	97											

Here highest rang is intrapersonal types intelligence lowest is linguistic. Highest mean for bodily kinesthetic while lowest mean intrapersonal type intelligence. Intrapersonal had more standard deviation than all other intelligence type while lowest for linguistic, intrapersonal had more variance while linguistic

had low. Linguistic, interpersonal, intrapersonal have positive and nearer to zero Skewness other have negative. Mathematical and spatial intelligence type have positive and nearer to zero kurtosis other have negative.

In order to answer the first hypothesis, a Pearson product-moment correlation coefficient was computed. There are a number of issues associated with the use of correlation coefficient. Before calculating the correlation coefficients, initial analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Afterwards, correlation analyses were used to describe the strength and direction of the linear relationships between any types of the Multiple Intelligences and academic achievements. The results are presented in Table 2.

Table 2
Correlation (Total Students) N=97

	GUJARATI	MATHS	SCIENCE	SOCIAL SCIENCE	HINDI	ENGLISH	COMPUTER	PHYSICAL TRAINING	DRAWING	MUSIC	TOTAL ACHIEVEMENT
Linguistic	-.015	-.044	-.069	-.054	-.090	.006	-.027	.055	.099	.009	-.033
Mathematical	-.107	.010	-.022	-.183	-.162	-.069	-.129	.136	.260 (*)	.195	-.061
Musical	-.240 (*)	-.263 (**)	-.364 (**)	-.243 (*)	-.310 (**)	-.301 (**)	-.256 (*)	.000	.071	-.083 (**)	-.291 (**)
Bodily-kinesthetic	.047	.105	.046	.041	.009	.115	.099	.221 (*)	.169	.143	.100
Spatial	-.193	-.191	-.200 (*)	.226 (*)	-.210 (*)	-.232 (*)	-.215 (*)	-.027	.053	-.129 (*)	-.220 (*)
Interpersonal	-.090	-.105	-.084	-.137	-.183	-.161	-.151	-.009	.234 (*)	.111	-.130
Intrapersonal	-.189	-.282 (**)	-.195	-.236 (*)	-.236 (*)	-.257 (*)	-.190	-.051	.033	.004	-.241 (*)

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

The results of the correlation coefficient for total sample in Table 2 revealed that there was a positive significant correlation between the mathematical intelligence and their drawing academic achievement ($r = .260, n = 97, 0.05$ level of sig.), bodily kinesthetic intelligence and physical training academic achievement ($r = .221, n = 97, 0.05$ level of sig.), the

interpersonal intelligence and drawing academic achievement ($r = .234, n = 97, 0.05$ level of sig.). However, there were no significant correlations between the other intelligence types and the students' different subject achievements. Therefore, as presented in Table 2, there was a medium correlation between the mathematical type intelligence and drawing academic achievement, bodily kinesthetic type's intelligence and physical training academic achievement, the interpersonal type of intelligence and drawing academic achievement suggesting quite a moderate relationship between the two variables. Based on the observed results, it can be concluded that among the seven intelligence types only three type mathematical type intelligence and drawing academic achievement, bodily kinesthetic types intelligence and physical training academic achievement, the interpersonal type of intelligence and drawing academic achievement had a significant correlation with the academic achievement. As a result, H_{01} as there are not any significant relationships between any types of the multiple intelligences and different subjects achievements is rejected with regard to the mathematical, bodily kinesthetic and interpersonal type of intelligence.

Table 3
Correlation (Girls) N=37

	Pearson correlation											
	GUJARATI	MATHS	SCIENCE	SOCIAL SCIENCE	HINDI	ENGLISH	COMPUTER	PHYSICAL TRAINING	DRAWING	MUSIC	TOTAL ACHIEVEMENT	
Linguistic	.139	.149	.071	.150	.128	.206	.157	.035	.105	.024	.159	
Mathematical	.015	.205	.145	.020	-.123	.081	.071	.417 (*)	.289	.355 (*)	.116	
Musical	.013	.066	-.168	.024	.034	-.092	-.019	.223	.084	-.015	-.004	
Bodily-kinesthetic	.222	.393 (*)	.228	.182	.137	.328 (*)	.258	.465 (**)	.336 (*)	.413 (*)	.323	
Spatial	-.141	-.173	-.154	-.228	-.255	-.286	-.223	.178	.066	.056	-.204	
Interpersonal	-.141	.028	-.154	-.228	-.255	-.286	-.223	.142	.133	.080	-.102	

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		.167		.027	.178	.290	.143	.070				
Intrapersonal		-	-	-	-	-	-	-	.163	.042	.158	-.200
		.174	.194	.077	.236	.340 (*)	.233	.195				

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

The results of the correlation coefficient for girls in Table 3 revealed that there was a positive significant correlation between the mathematical intelligence and their physical training academic achievement ($r = .417, n = 37, 0.05$ level of sig.) also with music academic achievement ($r = .355, n = 37, 0.05$ level of sig.) respectively. Bodily kinesthetic intelligence and Math's academic achievement ($r = .393, n = 37, 0.05$ level of sig.), English academic achievement ($r = .328, n = 37, 0.05$ level of sig.), physical training academic achievement ($r = .465, n = 37, 0.01$ level of sig.), drawing academic achievement ($r = .336, n = 37, 0.05$ level of sig.), music academic achievement ($r = .413, n = 37, 0.05$ level of sig.) respectively. The intrapersonal intelligence and Hindi academic achievement ($r = .413, n = 37, 0.05$ level of sig.) respectively. However, there were no significant correlations between the other intelligence types and the students' different subject achievements. Therefore, as presented in Table 3, there was a medium correlation between the mathematical intelligence and their physical training academic achievement, music academic achievement. Bodily kinesthetic intelligence and Math's academic achievement, English academic achievement, physical training academic achievement, physical training academic achievement, drawing academic achievement, music academic achievement. Intrapersonal intelligence and Hindi academic achievement suggesting quite a moderate relationship between the two variables. Based on the observed results, it can be concluded that among the seven intelligence types only three type mathematical intelligence and their physical training academic achievement, music academic achievement. Bodily kinesthetic intelligence and Math's academic achievement, English

academic achievement, physical training academic achievement, physical training academic achievement, drawing academic achievement, music academic achievement. Intrapersonal intelligence and Hindi academic achievement had a significant correlation with the academic achievement. As a result, H_{02} as there are not any significant relationships between any types of the multiple intelligences and different subjects achievements is rejected with regard to the mathematical, bodily kinesthetic and interpersonal type of intelligence.

Table 4
Correlation (Boys) N=60

	GUJARATI	MATHS	SCIENCE	SOCIAL SCIENCE	HINDI	ENGLISH	COMPUTER	PHYSICAL TRAINING	DRAWING	MUSIC	TOTAL ACHIEVEMENT
Linguistic	.166	.197	.195	.228	.228	-.158	.195	-.047	.069	.190	-.210
Mathematical	.241	.143	.165	.363 (**)	.205	-.201	.313 (*)	-.115	.220	.030	-.230
Musical	.436 (**)	.468 (**)	.519 (**)	.432 (**)	.485 (**)	-.454 (**)	.439 (**)	-.197	.044	.296 (*)	-.503 (**)
Bodily-kinesthetic	.096	.086	.094	.071	.069	-.039	.029	.065	.049	.025	-.067
Spatial	.229	.200	.233	.222	.183	-.192	.209	-.131	.051	.257 (*)	-.232
Interpersonal	.050	.175	.119	.119	.136	-.177	.205	-.073	.298 (*)	.232	-.151
Intrapersonal	.238	.382 (**)	.324 (*)	.264 (*)	.180	-.303 (*)	.215	-.304 (*)	.007	.217	-.319 (*)

The results of the correlation coefficient for boys in Table 4 revealed that there was a positive significant correlation between the interpersonal intelligence and their drawing academic achievement ($r = .298, n = 60, 0.05$ level of sig.), while negative significant correlation between the mathematical intelligence and social science academic achievement ($r = .363,$

$n = 60$, 0.05 level of sig.) Musical intelligence and Gujarati academic achievement ($r = -.436$, $n = 60$, 0.01 level of sig.) Musical intelligence and maths academic achievement ($r = -.519$, $n = 60$, 0.01 level of sig.), musical intelligence and social science academic achievement ($r = -.485$, $n = 60$, 0.01 level of sig.) musical intelligence and Hindi academic achievement ($r = -.485$, $n = 60$, 0.05 level of sig.) musical intelligence and English academic achievement ($r = -.454$, $n = 60$, 0.05 level of sig.) Musical intelligence and English academic achievement ($r = -.454$, $n = 60$, 0.05 level of sig.), musical intelligence and computer academic achievement ($r = -.439$, $n = 60$, 0.05 level of sig.), musical intelligence and music academic achievement ($r = -.257$, $n = 60$, 0.05 level of sig.) musical intelligence and total academic achievement ($r = -.503$, $n = 60$, 0.05 level of sig.) the spatial intelligence and music academic achievement ($r = .234$, $n = 60$, 0.05 level of sig.). the intrapersonal intelligence and math's academic achievement ($r = -.382$, $n = 60$, 0.05 level of sig.) the intrapersonal intelligence and science academic achievement ($r = -.324$, $n = 60$, 0.05 level of sig.) the intrapersonal intelligence and social science academic achievement ($r = -.264$, $n = 60$, 0.05 level of sig.) the intrapersonal intelligence and English academic achievement ($r = -.303$, $n = 60$, 0.05 level of sig.) the intrapersonal intelligence and physical training academic achievement ($r = -.304$, $n = 60$, 0.05 level of sig.) the intrapersonal intelligence and total achievement academic achievement ($r = -.319$, $n = 60$, 0.05 level of sig.). However, there were no significant correlations between the other intelligence types and the students' different subject achievements. Therefore, as presented in Table 4, there was a medium correlation between the interpersonal type intelligence and drawing academic achievement As a result, H_{03} as there are not any significant relationships between any types of the multiple intelligences and different subjects achievements is rejected with regard to the interpersonal intelligence.

Generally, for all the students it is discovered that there are some significant negative correlations between students' multiple intelligences and their academic achievement. Positive correlation between the mathematical intelligence and their drawing academic achievement, bodily kinesthetic intelligence and physical training academic achievement, the interpersonal intelligence and drawing academic achievement in total sample, while mathematical intelligence and their physical training academic achievement, also with music academic achievement respectively. Bodily kinesthetic intelligence and Math's academic achievement, English academic achievement, physical training academic achievement, drawing academic achievement, music academic achievement respectively, intrapersonal intelligence and Hindi academic in girls sample respectively and the interpersonal intelligence and their drawing academic achievement. The strengths between these relationships are all quite weak. On the other hand, the multiple intelligences for linguistic in total sample, linguistic, musical spatial interpersonal in girls sample, linguistic and bodily kinesthetic in boys sample do not show any significant relationship with academic achievement.

Conclusion:

This study investigates the relationship between the multiple intelligences and their achievement in with different subjects. What the results can conclude for this study is that in an environment where multiple intelligences may not have a strong presence in the classroom practice, both learners and practitioners may be unable to gain the best results. In a nutshell, this study could help teachers to consider how best to teach different subjects with multiple intelligences in mind. They can organize the class activities in such a way to develop all students multiple intelligences. It could also encourage the learners to use multiple intelligences to learn different

language and different subjects as they become properly aware of the issue. Having adjusted at utilizing their intelligences efficiently through practice and experience, the learners can easily learn autonomously.

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