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Impact of Multiple Intelligences Based Teaching on Academic Performance of University Students

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Abstract: Multiple intelligence-based teaching empowers diverse learners by catering to their unique strengths, fostering deeper engagement and understanding. This personalized approach significantly enhances students' academic performance and overall learning outcomes. The present study focused Impact of multiple intelligences based teaching on students' academic performance. Correlational research design was applied. Teachers and students of five reputed universities of Khber PakhtunKhwa were constituted the population of the study. A sample of 25 teachers and 118 students were selected by using stratified sampling method. Two research tools were used by the researcher. Multiple Intelligence Based Teaching and Students Academic Performance scale were used for data collection. Content validity were used to validated the instrument while multiple intelligence based Teaching scale and academic performance scale were estimated .893 and .788 respectively. Pearson Product Moment Correlation, regression analysis, Independent sample t-test and ANOVA was used as inferential statistics. The result of the study depicts that Multiple Intelligence Based Teaching has significant impact on the students' academic performance. The study recommended that faculty member teachers working at HEIs may receive continuous trainings on practical application of multiple intelligence based teaching in classroom setting.

Keywords: Multiple Intelligence, Academic Performance, Higher Education Institutions (HEIs)

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Introduction

In the broadest definition, intelligence is the capacity to use concepts and perceptions to understand the links between objects, to reevaluate events and circumstances, and to employ mental processes in a way that is compatible with a goal. Although Gardner (1983) states that intelligence is "the capacity of an individual to disclose a product in one or more cultures and the capacity to quickly and effectively resolve an issue that arises in his or her day-to-day or work-related life. Yaumi et al. (2018) defined it as the capacity to mold or solve a product or shape within one or more cultural institutions. Even though there are various definitions of intelligence, the majority of theories about it agree that intelligence is a congenital ability or potential that is inherited from one generation to the next and is a complex that is influenced by learning and environmental factors that affect the central nervous system.

Gardner (1983) defined intelligence as the capacity to solve a problem by producing a valuable product in one or more social contexts. Gardner (1983) developed a theory of multiple intelligences for this reason. "Intellect is a behavioral and emotional mental ability to work out the data that can be utilized in a social setup to explain a problem or generate products that are of importance in a society," Gardner reinterpreted the term in 1999. According to Gardner, intelligence is not a single general skill. Each human possesses at least eight distinct intelligences, each of

which manifests at varying degrees. The field of psychology is where the concept of multiple intelligences (MIs) originated.

Teachers' everyday experiences are validated by the MIs theory. According to theory, each learner receives, processes, and thinks about the information in a variety of ways. The majority of studies have demonstrated that focusing on multiple intelligences during the teaching and learning process consistently yields positive outcomes. Students display their abilities based on numerous intelligences (Winarti et al., 2019). Individual students develop unique learning styles and aptitudes, so multiple intelligence classrooms allow teachers to implement teaching approaches based on innovations that comprise a broad range of methods, information, and strategies. The approaches based on MIs have expanded educational backgrounds, even for those students who were deemed ineffective and uninterested. Teachers can reveal each student's full learning capacities by implementing the multiple intelligence theory in the classroom.

Few academics have studied multiple intelligences and how they affect university students' academic success. These studies found a high correlation between multidimensional intelligence and academic success. Students with high logical-mathematical intelligence outperformed those with other intelligence types in the classroom. Qutab et al. (2024) into how multiple intelligences affected students' learning style. The study found that students with logical-mathematical intelligence did better in mathematics than students with other types of intelligence. Nyhammer (2022) investigated how university students' learning preferences were impacted by different intelligences. The study found that students' preferred learning styles and their dominant intelligence type were highly correlated. For example, students with strong linguistic intelligence prefer text-based resources, while students with high bodily-kinesthetic intelligence prefer hands-on activities.

Qutab et al. (2024) conducted study on multiple intelligences and their impact on college students' academic achievement. The study found that students with high interpersonal intelligence did better academically in the social sciences and humanities. For the current study, the literature on how multiple intelligences affect students' preferred learning styles at universities in Rawalpindi was evaluated. The research's analysis indicates that students' learning preferences and dominant intelligence types are closely related to both their academic success and multiple intelligences. This implies that teachers should develop teaching strategies that take into account the different learning styles of their students. This can be achieved by incorporating learning materials and activities that cater to different types of intelligence. Therefore, the current study recommends that future research focus on creating practical methods for incorporating multiple intelligence theory into university courses. The present study aimed to investigate the impact Multiple Intelligence Based Teaching on the students' academic performance.

Objectives of the Study

The objectives of the study were

1. To find out the association of Multiple Intelligence Based Teaching with students' academic performance.
2. To investigate the mean difference among teachers regarding Multiple Intelligence Based Teaching.

Review of the Literature

Numerous factors, such as gender, age, marital status, parental education, parental involvement, academic achievement, etc., have a big influence on how successfully children develop multiple intelligences, claims Finkenthal (2019). Furthermore, the core idea is that intelligence is not a single, static, and monolithic thing that evolves throughout time. To say the opposite is true. The emergence of multiple intelligences is also influenced by the cultural and social context, according to another researcher. Jaleel (2016) found that the greatest scores were obtained by individuals with visual and kinesthetic intelligences. According to Badt (2017) some dimensions of intelligences like naturalist and visual are among the lowest, verbal, logical and interpersonal are more prevalent. As per the results of the study conducted by Pour-Mohammadi et al. (2012), students struggle in their kinesthetic and neutralist intelligences whereas perceived strengths in interpersonal and verbal intelligences. Kim (2020) found that teachers who teaches under multiple based teaching helps students to value their unique skills and abilities. Moreover, Gardner (2011) explored that multiple intelligence play significant role in changing classroom setting and learning styles on

target students' attitudes toward math, achievement in the subject, and problem-solving skills. Gardner (2011) put forth the multiple intelligence (MI) theory. He had designated nine distinct intelligences. According to this theory, each person uses their own intelligence style to learn more efficiently.

Conceptual Structure of Multiple Intelligences

Based on Howard Gardner's Theory of Multiple Intelligences (1983; 1993), this research is conducted. Gardner argued that people have multiple, largely separate, but connected forms of intelligence, challenging the idea that intelligence is a single entity. An eighth intelligence—naturalistic intelligence—was subsequently added to his original seven intelligences. A distinct approach to learning and problem-solving is represented by each intellect.

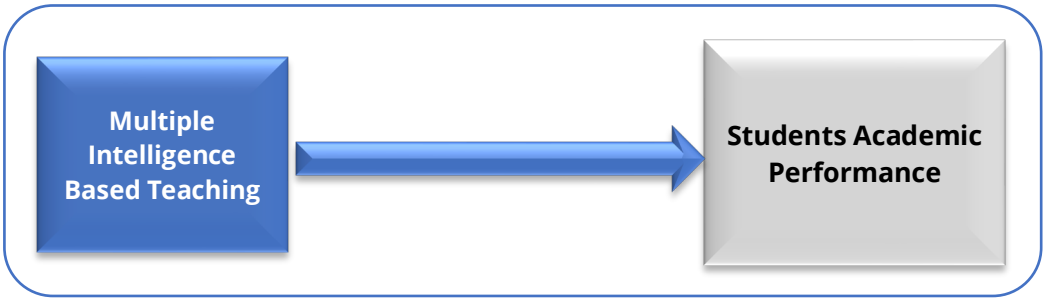
The Role of Teachers and Their Views

Teachers are essential to the successful application of MI techniques. Their perception of and attitude towards MI have impact on how it is used in the classroom (Leasa & Corebima, 2017). Professional development programs that emphasize MI have been found to greatly improve instructors' capacity to identify and accommodate students' varied intelligences (Ozdemir et al., 2006). According to Chen, Moran, and Gardner (1983), teachers' ability in engaging pupils with varying learning requirements may also be influenced by their own intelligence profiles.

Critiques and Difficulties

MI theory has been criticised for lacking empirical support, despite its widespread acceptance. According to critics, the hypothesis is not supported by strong scientific data, and it is challenging to assess the intelligences on one's own (Waterhouse, 2006). MI is still a useful paradigm for teaching and learning, nonetheless, because of the observable advantages in educational settings.

Conceptual Model



Research Methodology

Research Design

A quantitative, correlational research design is used in this study to examine the connection between students' academic achievement and multiple intelligences. Because it enables the researcher to investigate the extent to which various intelligences (Multiple intelligence based Teaching Scale) are linked to students' academic success (Academic performance Scale), a correlational method is appropriate. The goal of the study is to ascertain whether there is a statistically significant association between the variables being examined without changing any of them.

Population and Sample

The population consisted of all instructors and students from the five (05) public universities in Khyber Pakhtunkhwa: Khushal Khan Khattak University, Karak (KKKUK), University of Lakki Marwat (ULM), University of Engineering & Technology (UET) Bannu Campus and Bannu, University of Engineering & Technology (UST), D.I. Khan, and Gomal University (GU). There are 102 TEACERHS, and the population was made up of 1761 pupils. Thus, using the stratified sample technique, 118 pupils and 25 teachers made up the sample.

Research Tools

Researcher was used an adapted instrument known as Multiple Intelligence Based Teaching which developed by Ellison and Rothenberger (1999). The Students' Academic Performance Scale, a modified questionnaire created by Khurshid (2020), was employed by the researcher. A five-point Likert scale served as the basis for the questionnaire.

Validity of Research Tools

Validation of tools were completed by using Content Validity Ratio (CVR), for this purpose, researcher validated through experts' opinion and the response were processed through CVR and found all the items were valid whereas the reliability of the multiple intelligence based Teaching scale and academic performance scale were estimated .893 and .788 respectively.

Methods of Data Analysis

Version 26.0 of the Statistical Package for the Social Sciences (SPSS) was used to analyses the data that had been gathered. The data was summarised using descriptive statistics including frequency distributions, means, and standard deviations. Pearson correlation coefficients were computed to ascertain the direction and intensity of the association between academic achievement and multiple intelligences. Additionally, the forms of intelligence that strongly predicted academic achievement were determined using multiple regression analysis.

Result and Discussion

Table 1

Tests of Normality for Dependent and Independent Variables

Variable	Kolmogorov-Smirnov	p-value	Shapiro-Wilk	p-value
Academic Performance	0.059	.067	0.985	.081
Logical-Mathematical	0.044	.200	0.987	.098
Linguistic Intelligence	0.050	.186	0.982	.076
Interpersonal Intelligence	0.056	.142	0.980	.083
Intrapersonal Intelligence	0.052	.178	0.979	.071

Table 1 indicates that all of the p-values in Table 1 are higher than.05, which denotes non-significant findings. This indicates that the distribution of each variable is roughly normal. Consequently, the presumptions for using parametric tests, including ANOVA, t-tests, and regression analysis, are satisfied.

Table 2

Descriptive Result of Multiple Intelligences and Academic Performance

Variable	N	Mean	SD	Minimum	Maximum
Linguistic Intelligence	300	3.75	0.68	2.1	4.9
Logical-Mathematical	300	3.61	0.71	2.0	4.8
Spatial Intelligence	300	3.43	0.64	1.9	4.7
Bodily-Kinesthetic	300	3.51	0.66	2.0	4.6
Musical Intelligence	300	3.25	0.72	1.8	4.9
Interpersonal Intelligence	300	3.88	0.65	2.3	4.9
Intrapersonal Intelligence	300	3.69	0.69	2.0	4.8
Naturalistic Intelligence	300	3.45	0.73	2.1	4.7
Academic Performance	300	3.42	0.52	2.1	4.0

The descriptive statistics in table 1 show that whereas musical intelligence had the lowest mean (M = 3.25), interpersonal and linguistic intelligence had the highest scores (M = 3.88 and 3.75, respectively). Moderately high (M = 3.42) and comparatively low variability (SD = 0.52) was the academic achievement. Naturalistic intelligence had the

largest dispersion (SD = 0.73), while the majority of intelligences displayed modest variability. Overall, kids consistently performed well academically and showed improved language and interpersonal skills.

Table 3

Regression analysis to Predicting Academic Performance from Multiple Intelligences

Predictor	B	SE B	β (Beta)	t	p
(Constant)	1.82	0.21	—	8.67	< .001
Logical-Mathematical	0.22	0.06	.26	3.67	< .001
Linguistic Intelligence	0.18	0.05	.24	3.60	< .001
Interpersonal Intelligence	0.14	0.06	.18	2.33	.021
Intrapersonal Intelligence	0.10	0.05	.13	2.00	.046

R^2 = .41, Adjusted R^2 = .39, F(4, 295) = 51.24, p < .00

The combined intelligences significantly predicted students' academic performance, according to the statistically significant regression model (F(4, 295) = 51.24, p <.001). Multiple intelligences appear to have a significant impact on students' academic performance, as the model accounts for 41% of the variance in academic performances (R2 =.41), a moderate to large effect size. The strongest individual predictor was logical-mathematical intelligence (β =.26, p <.001), suggesting that students with high IQs typically perform better academically. Additionally, there was a substantial positive influence of linguistic intelligence (β =.24, p <.001), confirming that verbal and language skills play a significant role in academic performance. The moderate effect of interpersonal intelligence (β =.18, p =.021) indicates that individuals who are able to collaborate and interact with others well may do better academically. The minor but significant effect of intrapersonal intelligence (β =.13, p =.046) suggests that academic accomplishment is also influenced by self-awareness and self-regulation. This investigation demonstrates that academic success is influenced by a mix of cognitive, social, and emotional intelligences. It encourages teachers to cultivate a variety of intelligence profiles in their instruction and backs Gardner's Multiple Intelligence Theory.

Table 4

Independent Samples t-Test Comparing academic performance by Gender

Group	N	Mean	SD	t	df	p
Male	150	3.38	0.51			
Female	150	3.47	0.52	-1.49	298	.137

There was no signifcant difference in the academic performance of male and female students, according to the independent samples t-test (t(298) = -1.49, p =.137). Thus, both male and female students perform similarly in our sample and that gender has no significant effect on academic achievement.

Table 5

One-Way ANOVA: Academic Performance by Dominant Intelligence Type

Source	SS	df	MS	F	p
Between Groups	5.68	4	1.42	5.91	< .001
Within Groups	70.71	295	0.24		
Total	76.39	299			

There was a statistically significant difference in academic performance between students with different dominant intelligence types, according to a one-way ANOVA: F(4, 295) = 5.91, p <.001. This implies that a student's dominant intelligence affects their academic achievement. Which groups differ significantly would be further revealed by a post-hoc analysis.

Discussion

The association between students' academic achievement and multiple intelligences was examined in the current study. The results showed that linguistic, intrapersonal, interpersonal, and logical-mathematical intelligences all significantly predict academic achievement, accounting for 41% of the variation in students' academic performance. The best predictor of these was logical-mathematical intelligence, which was closely followed by linguistic intelligence. Wilson and Mujtaba (2011) conducted a study on the multiple intelligence theory and university students' learning styles that found no association. It found no correlation between students' preferred learning strategies and their dominant intelligence type. Wilson (2011) conducted a study on the scant evidence supporting the multiple intelligence theory and university student learning styles. This idea has little bearing on how students study at the university level. Research by Sener and Çokçaliskan (2018) on learning styles and multiple intelligence theory at the university level: a conundrum to be resolved. Students' selected learning styles and the multiple intelligence hypothesis did not have a statistically significant link. Evaluating how many intelligences affect students' learning styles was the study's second main goal. The study's conclusions showed that kids' learning styles are not significantly impacted by multiple intelligences. In a related study, Moafian and Ebrahimi (2015) sought to determine whether university students possessed multiple intelligences.

Conclusion and Recommendations

The study concluded that positive correlation was existed among the different dimensions of MI based teaching on students' academic performance. Teachers who teach according to multiple based teaching approaches have the ability to identify the students' intelligence profile of the students having difficulty in comprehending the subject and to prepare appropriate activities for these profiles. If teachers have insufficient knowledge about the subject, they can be informed about multiple intelligences-based instructions. Therefore, the study recommended that faculty member teachers working at HEIs may receive continuous trainings on practical application of multiple intelligence based teaching in classroom setting.

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