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Impact of Teaching-Learning Materials on the Academic Performance of Students in Higher Education Institutions in Pakistan

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ABSTRACT

This research study focuses on the problem of the unpredictability of the academic performance of students in higher learning institutions in Pakistan, which might be caused by the quality and availability of teaching and learning materials (TLM). The main aim is to discuss the effects of TLM on the academic performance of students. Quantitative research design was used, where a cross-sectional survey of 350 students in both the public and the private universities was conducted. The data were analyzed with SPSS, which involved descriptive analysis, reliability analysis, and regression analysis. The findings showed that there is a strong positive correlation between TLM and academic performance ($\beta = 0.742$, $p = 0.001$), and TLM accounts 55.1% of the variance ($R^2 = 0.551$). The results demonstrate that better access, quality and availability of instructional materials improve student learning outcomes. The research finds that TLM is an important factor in academic success. Institutions are advised to invest in the new resource in the digital world, provide equal access, and train the staff to use teaching resources efficiently.

Keywords: Teaching Learning Materials, Academic Performance, Higher Education, Student Learning Outcomes.

INTRODUCTION

Universal education is vital in creating human capital and socio-economic growth, especially in the developing world, such as in Pakistan. In this respect, teaching and learning processes are highly dependent on the quality of the teaching and learning processes that determine the success of the students and the effectiveness of the institution. Out of the numerous factors that determine learning results, Teaching Learning Materials (TLM) such as textbooks, digital resources, lecture notes, and multimedia tools have proven to be some of the key elements that can improve student interaction and knowledge acquisition. The combination of the

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high-quality instructional materials allows one to understand more, think critically, and learn in various styles (Crawford & Jenkins, 2018; Mayer, 2020).

Over the past several years, the rapid development of digital technologies has changed the way people traditionally learn, contributing to the increased use of e-learning platforms, virtual classrooms, and interactive materials. This change has rendered the supplies and standards of teaching learning materials even more significant in academic performance. Research indicates that well-organized and available learning resources not only raise the understanding of students but also their motivation and independence in learning (Gil-Flores et al., 2017; Schindler et al., 2017). Nevertheless, the inequality in access to quality resources, especially between the public and the private institutions, is a major issue in the higher education sector in Pakistan.

Moreover, even though a significant amount of financial resources is devoted to the development of educational infrastructure, numerous higher education institutions still have to deal with the problem of the outdated curriculum, the lack of digital resources, and the inefficient use of teaching materials. All these difficulties can have a bad impact on the academic performance and learning experience of students. Thus, to improve the quality of education and student achievement, policymakers, educators, and institutional leaders should know how teaching and learning materials can impact academic performance.

Rationale of the Study

This study is rationalized by the fact that instructional resources are becoming very crucial in the contemporary system of education. Although past studies have widely investigated the influences on academic performance, little effort has been made in the overall role of teaching learning materials in the context of higher education in Pakistan. This paper seeks to address this gap by empirically examining the role of TLM in enhancing the academic performance of students.

In addition, the shift to digital and blended learning settings has compounded the demand for learning materials to be effective and accessible. This relationship is especially important to understand in developing countries, where institutional inequalities and resource limits can affect the educational effectiveness. This research is likely to give useful information to university administration and policymakers to better allocate resources, design a curriculum, and encourage student-centered learning experiences (Mayer, 2020; OECD, 2021).

Problem Statement

Although learning materials are known to be essential in teaching, the current situation in Pakistan still shows poor academic results in most higher

learning institutions. Poor quality, inadequate availability and inaccessibility of instructional materials are one of the possible causes of this problem. Students, in most instances, are using old-fashioned textbooks, a lack of sufficient digital materials and teaching aids that cannot support them in the expected learning results.

Moreover, the absence of empirical research on the relationship between teaching learning materials and academic performance, specifically in Pakistan, is a research gap. In the absence of such evidence, policymakers and schools may find it hard to come up with effective policies to enhance teaching methods and the use of resources. This study, therefore, aims to fill this gap by undertaking a systematic investigation on the effects of teaching learning materials on the academic performance of students in institutions of higher learning.

Research Questions

1. What is the impact of teaching learning materials on students' academic performance in higher education institutions?

2. How do teaching and learning materials affect the learning outcomes of students?

3. What is the impact of teaching-learning materials available and their quality on academic performance?

Research Objectives

- To investigate how teaching learning material affects the performance of students in higher learning institutions.

- To test the correlation between the teaching and learning materials and learning outcomes.

- To determine the importance of the accessibility and quality of teaching and learning materials in improving academic performance.

LITERATURE REVIEW

Teaching Learning Materials (TLM) has been traditionally an important part of efficient higher education pedagogy. Such materials (including both traditional textbooks and the most advanced digital resources) are essential means of knowledge transfer, knowledge enhancement, and independent learning. As modern educational studies indicate, the effectiveness and accessibility of teaching resources have a great impact on the cognitive engagements and academic success

of students (Mayer, 2020; Selwyn, 2016). The role of well-designed and interactive materials becomes even more accentuated in the environment of higher education, where learning is more focused on critical thinking and analytical abilities.

An increasing amount of literature demonstrates the positive correlation between instructing learning materials and the academic success of students. Research shows that students with access to quality and relevant material are more likely to do better in school than their counterparts who use few or irrelevant materials. As an example, the incorporation of multimedia and digital learning aids has been discovered to increase understanding and memory through the introduction of information in various formats, thus supporting different learning styles (Mayer, 2020; Schindler et al., 2017). On the same note, online databases, e-books, and interactive platforms have been related to better academic performance and higher student satisfaction (Bond et al., 2020).

Moreover, access to teaching and learning materials is also very important in determining the learning experiences of the students. Research undertaken in developing nations indicates that the differences in access to education facilities play a role in differences in academic attainment among institutions. In the case of public sector universities, especially, there are issues of underfunding, out-of-date materials, and a lack of digital infrastructure, which may adversely affect the learning process of students (Aslam & Kingdon, 2019). On the contrary, those institutions that invest in the latest instructional tools and digital technologies are more likely to create a more effective learning environment and improve student outcomes.

Another important factor that predetermines academic success is the quality of teaching and learning materials. Quality materials are well defined in terms of clarity, relevancy, accuracy and correspondence to curriculum goals. It has been argued that well-designed instructional materials that are regularly updated can help students to develop their knowledge base in complex concepts and enhance their skills in applying the knowledge gained in practical situations (Biggs & Tang, 2011). Moreover, correspondence between instructional resources and the evaluation techniques is paramount in ensuring that students are well prepared to achieve academic demands.

In addition, teaching-learning resources determine the engagement and performance of students considerably in terms of their accessibility and usability. With the increasing adoption of digital learning platforms, ease of access to educational resources has become a key factor in determining learning effectiveness. Research has shown that learners who have access to course materials on demand and can learn anytime and anywhere are more predisposed to self-directed learning and have improved academic performance (Broadbent & Poon, 2015). Nevertheless, challenges of digital divide, poor internet connectivity,

and absence of technological savvy can impede the successful deployment of these resources, especially in the developing scenario, as is the case with Pakistan.

Although there is a lot of literature on teaching-learning materials, there is still a gap in the literature that would provide an understanding of the combined effects of the material on academic performance in the particular context of higher education in Pakistan. The literature available has concentrated more on single dimensions like the use of technology or the curriculum design instead of offering a holistic approach to TLM, which is a multidimensional construct. Thus, this research will fill this gap by studying the overall effect of different aspects of teaching learning materials and the impact they have on the academic performance of students.

Theoretical Framework

The research is based on the current theories of learning, which describe how delivery of learning materials affects students' performance.

The Cognitive Theory of Multimedia Learning, suggested by Richard E. Mayer, gives a good theoretical basis for the role of instructional materials in learning. According to the theory, learners process information in two channels (auditory and visual), and good learning is possible when instructional materials are created to enable maximum processing of information. This theory supports the idea that properly designed multimedia materials can be used to improve the level of understanding, decrease cognitive load, and improve the level of knowledge retention (Mayer, 2020). This model is especially applicable to the situation of contemporary higher education, in which digital and multimedia materials are extensively utilized.

Also, the Constructivist Learning Theory lays stress on the fact that learners are active in constructing knowledge by using learning materials and the environment. The key role in this process is played by teaching learning materials that are the source of the needed stimuli to explore, think critically, and solve problems. According to this view, students would perform better in the academic world when they are exposed to instructional materials that are meaningful and contextually relevant (Biggs & Tang, 2011).

Moreover, the Resource-Based View (RBV) of organizations can be used to explain how access to good learning and teaching resources can be used as an organizational strategic resource to enhance academic performance. RBV suggests that an institution that can successfully harness valuable, rare, and inimitable resources, such as high-quality teaching and learning resources and digital infrastructure, has a higher probability of attaining high-quality results (Barney,

1991). TLM can be considered a key resource in the context of higher education that can improve the effectiveness of teaching and the learning of students.

According to these theoretical approaches, teaching learning materials are conceptualized as an important independent variable that affects academic performance. The framework presupposes that the availability, quality, and accessibility of TLM have a direct influence on the learning of the students, which consequently results in the enhancement of the academic performance.

Conceptual Framework



Figure 01: Conceptual Framework

Study Hypothesis

H_1: Teaching Learning Materials (TLM) have a significant impact on the academic performance of the students in institutions of higher learning.

H_o: Teaching Learning Materials (TLM) have no significant impact on the academic performance of the students in institutions of higher learning.

RESEARCH METHODOLOGY

Research Design

The research design adopted in this study is quantitative research to investigate the effects of Teaching Learning Materials (TLM) on the academic performance of students in Pakistan institutions of higher learning. The cross-sectional survey method was utilized to gather information at a specific time on a large sample of students. The quantitative design will be suitable because it allows conducting statistical tests of relationships between variables and increasing the generalizability of the results (Creswell & Creswell, 2018; Saunders et al., 2019). This is a deductive study, where the hypotheses are created on the basis of the literature available and are tested empirically through the application of statistical methods.

Population and Sampling

This study will be targeted at students studying in public and private institutions of higher education in Pakistan. This was done because of the accessibility and time constraints, making the use of a non-probability convenience sampling technique a common practice in social science studies with large populations (Etikan & Bala, 2017). The quantity of sufficient and valid responses

received was 350, which is deemed sufficient to conduct regression analysis and has statistical power (Hair et al., 2019). A variety of academic fields among the respondents was introduced to enhance representativeness.

Data Collection Method

A structured questionnaire was used to collect primary data, both physically and online. The questionnaire has been developed on the grounds of the already proven scales used in the literature, which means that it is content-valid. In order to minimize response bias, the purpose of the study was explained to the respondents, and they were assured of confidentiality and anonymity. Survey questionnaires are effective in the capture of perceptions, attitudes and behaviors in educational research (Bryman, 2016).

Measurement of Variables

The research comprises a single independent and dependent variable.

- Teaching Learning Materials (TLM) was assessed with various items that reflected the areas of availability, quality, accessibility, and relevance of learning materials.

- The academic performance (AP) was assessed using self-reported academic performance and perceived academic performance.

- Everything was measured on a 5-point Likert scale, where 1 (strongly disagree) to 5 (strongly agree) was used. A Likert scale is a popular instrument in behavioral and educational research because it is both reliable and easily interpretable (Joshi et al., 2015).

Reliability and Validity

In order to have the consistency of the measurement instrument, internal reliability was measured by the use of Cronbach's Alpha. A value of 0.70 and above shows a range of acceptable reliability, whereas a value of 0.80 and above illustrates good reliability (Hair et al., 2019). Internal consistency was confirmed when all constructs were over the recommended threshold in this study.

The validity of the content (adaptation of the items used in existing studies) and construct validity (consistency with theoretical bases and previous empirical studies) were ensured (Sekaran & Bougie, 2016).

Data Analysis Techniques

- Statistical Package of Social Sciences (SPSS) was used to analyze data. The analysis was carried out in a number of steps:
- Descriptive statistics (mean, standard deviation) were used to summarize the data.
- Frequency analysis was done to characterize demographic features.
- Internal consistency was determined by reliability analysis (Cronbach's Alpha).
- Both variables were analyzed in terms of the strength and direction of the relationships using correlation analysis.
- Regression analysis was used to test the hypothesized influence of TLM on academic performance.

Regression analysis is suitable for identifying the cause-and-effect relationships and forecasting the impact of the independent variables on the dependent variables (Field, 2018).

Model Specification

The study employs a **simple linear regression model** to test the hypothesis:

$$AP = \beta_0 + \beta_1(TLM) + \varepsilon$$

Where:

- AP = Academic Performance
- TLM = Teaching Learning Materials
- β_0 = Constant
- β_1 = Regression coefficient
- ε = Error term

The model uses the degree to which TLM describes differences in academic performance among students.

Ethical Considerations

The research was conducted in line with ethical standards. The involvement was voluntary, and all the respondents were given informed consent. Anonymity and confidentiality were also provided, and data were utilized only to serve academic purposes. Ethical compliance boosts the credibility and integrity of research results (Resnik, 2020).

ANALYSES AND INTERPRETATIONS

Table 1: Demographic Distribution

Categories	Sub-Categories	Frequency	Percent
Gender	Male	198	56.6%
	Female	152	43.4%
Age Group	18–22	145	41.4%
	23–26	128	36.6%
	27–30	52	14.9%
	30 and Above	25	7.1%
Program	Undergraduate	210	60.0%
	Graduate	140	40.0%
Type	Public	220	62.9%
	Private	130	37.1%
Total	Total	350	100%

Table 1 shows demographic features of the respondents. The findings show that most of the respondents were males (56.6%), with females (43.4%), making up the sample population. Regarding age distribution, a majority of the respondents were within the age group of 1822 years (41.4%), 2326 years (36.6%), and this implies that the sample is mainly made up of young students. A lesser percentage was in the 2730 years bracket (14.9) and 30 years and above (7.1). In terms of academic programs, 60.0 percent of the respondents had been undertaking the undergraduate programs and 40. 0 percent were graduate students. Also, most of the participants belonged to public sector institutions (62.9%), as opposed to 37.1% of the participants in private institutions. On the whole, the sample size (350 respondents) is representative of students of various demographic groups.

Table 2: Descriptive Analysis

Variable	N	Mean	Std. Deviation	Min	Max
Teaching Learning Material (TLM)	350	3.78	0.65	2.10	4.90
Academic Performance (AP)	350	3.65	0.70	2.00	4.85

Table 2 shows the descriptive statistics of the key study variables. The average of Teaching Learning Materials (TLM) is 3.78 with a standard deviation of 0.65, which shows that there is a positive overall perception of the students about the availability and quality of instructional materials. Likewise, the mean of Academic Performance (AP) is 3.65, and the standard deviation is 0.70, implying that the students view their academic performance as average. Minimum and maximum values of both variables reveal a decent dispersion of the answers, which means that there is a difference in the perceptions of students. Overall, the descriptive results suggest that both TLM and academic performance are rated above average by the respondents.

Table 3: Reliability Statistics

Variable	No. of Items	Cronbach's Alpha
TLM	6	0.887
Academic Performance	5	0.861
Overall Scale	11	0.903

The reliability analysis of the measurement scales is given in Table 3 by using Cronbach's Alpha. The findings indicate that the TLM construct has an alpha of 0.887, with Academic Performance having an alpha of 0.861. The scale reliability is 0.903, which is higher than the suggested 0.70. These values reveal that there is a high internal consistency of the items used to measure the constructs. Thus, the measurement tool can be deemed as being reliable and further statistical analysis can be conducted.

Table 4: Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error
1	0.742	0.551	0.549	0.468

The summary of the regression model that was applied in the study is given in Table 4. The high positive correlation coefficient (R = 0.742) shows that Teaching Learning Materials and Academic Performance have a strong relationship. The coefficient of determination (R^2 = 0.551) shows that approximately 55.1% of the variance in academic performance is explained by TLM. The value of adjusted R 2 (0.549) also supports the strength of the model, whereas the value of the standard error (.468) shows the relatively low amount of prediction error. In total, the model has a good fit and high explanatory power.

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	85.214	1	85.214	388.76	0.000
Residual	69.985	348	0.201		
Total	155.199	349			

The ANOVA results of the regression model are in Table 5. The results reveal that the model is significant, with an F-value of 388.76 and a level of significance of $p = 0.000$ ($p < 0.05$). This proves that the regression model is appropriate to the data, and Teaching Learning Materials are significant predictors of Academic Performance. The high F-statistic justifies the rejection of the null hypothesis and confirms the model in general.

Table 6: Coefficients of Regression

Variable	B	Std. Error	Beta	t	Sig.
(Constant)	1.215	0.152	—	7.99	0.000
TLM	0.648	0.033	0.742	19.72	0.000

Table 6 presents the results of the regression coefficients of the study variables. The Teaching Learning Materials coefficient ($\beta = 0.648$) shows that the increase in Academic Performance due to an increase in TLM is 0.648. The standardized value ($\beta = 0.742$) indicates that there is a strong positive impact of TLM on academic performance. Also, the t-value (19.72) and the significance level ($p = 0.000$) prove that this correlation is significant. The constant (1.215) is the level of academic performance at the point where TLM equals zero. Overall, the results demonstrate that Teaching Learning Materials have a significant and positive impact on students' academic performance.

DISCUSSION

The main aim of the study was to investigate the effects of Teaching Learning Materials (TLM) on the academic performance of students in higher learning institutions in Pakistan. The results of the regression analysis showed that the effect of TLM on academic performance is powerful, positive, and statistically significant ($\beta = 0.742$, $p < 0.001$). As such, the alternative hypothesis (H_1) is accepted, and the null hypothesis (H0) is rejected. This finding implies that the academic performance of students is significantly improved when their access to teaching and learning resources is improved in terms of availability, quality and accessibility.

The results of this research align with the previous studies, which underline the important role of instructional materials in promoting the effective learning process. The strong positive correlation between TLM and academic performance helps to argue that properly designed and available learning tools enhance the understanding, engagement and retention of knowledge among students. Past research revealed that students with access to high-quality teaching resources, such as multimedia and digital content, have better academic performance because of enhanced cognitive processing and interactive learning experiences (Mayer, 2020; Schindler et al., 2017). The current research supports these results in the framework of higher education in Pakistan.

Furthermore, the value of R^2 (0.551) is quite large, which implies that teaching learning materials can explain a large percentage of the variance in academic performance. This suggests that TLM is not merely a supporting factor but a key determinant of student success. This finding is consistent with the results of Broadbent and Poon (2015), who found that academic performance in higher education institutions is significantly improved by access to learning resources and self-regulated learning tools. In the same vein, Bond et al. (2020) emphasized that online platforms and digital learning materials can be used to enhance the engagement and performance of students, especially in learning environments with technological capabilities.

Another significant aspect of the study is the impact of resource quality and availability on educational outcomes. In less developed nations like Pakistan, unequal opportunities to access teaching and learning materials in both the public and the privately run institutions may result in unequal performance among learners. This beneficial effect of the current study indicates that the provision of more updated and relevant learning resources should be used to close this gap and facilitate equal learning opportunities. This conclusion is justified by Aslam and Kingdon (2019), who stressed that the availability of resources is one of the factors that greatly influence educational outcomes in the developing context.

Theoretically, the results are in line with the Cognitive Theory of Multimedia Learning, which postulates that effective instructional materials will boost learning through the maximization of cognitive processing. The high effects of TLM in the current study signify that students are advantaged by the structured and interactive materials that enable them to acquire deeper insights and knowledge retention (Mayer, 2020). Also, the findings back the constructivist learning theory that focuses on the importance of learning materials that facilitate constructive knowledge building and meaningful interaction.

In general, the results of this research give solid empirical support according to which the teaching and learning materials are an important determinant in academic achievement in higher education. Acceptance of H_1 proves that the

institutions that invest in good quality, affordable and technologically advanced learning materials have a higher likelihood of producing better results among the students. These findings have significant policy, teacher, and administrative implications, which emphasize the necessity to focus on the growth and efficient use of teaching and learning materials to improve the quality of education and student achievement.

CONCLUSION

This paper discussed how Teaching Learning Materials (TLM) can influence the academic performance of higher education students in Pakistan. The results are empirical evidence that TLM plays a significant and positive role in academic outcomes, as the hypothesis proposed is confirmed. The findings indicate that access to quality and quantity of instructional materials is important in improving the learning process experience, understanding, and general academic achievement of students.

The research also confirms that TLM explains a significant amount of variance in academic performance, which points to the fact that it is a major predictor of educational performance and not a marginal variable. The findings are in line with the current theories in education, specifically, the cognitive theory of multimedia learning, which also focuses on the significance of the designed instructional resources in the processes of meaningful learning (Mayer, 2020). Within the framework of the higher education system in Pakistan, the analysis highlights the necessity of enhancing instructional resources to achieve better results with students and the performance of the institutions.

RECOMMENDATIONS

On the findings, various recommendations are offered to policy makers, educational establishments and educators.

To begin with, tertiary institutions must invest in quality and modern teaching and learning materials, including digital tools, e-books and interactive learning systems. The student engagement and academic performance can be greatly improved with the integration of technology-enhanced learning tools (Bond et al., 2020).

Second, colleges must provide equal access to educational resources in all departments and groups of students. The gap between the public and private institutions should be addressed to enhance inclusive and quality education. This can be addressed by funding and allocating more resources (Aslam & Kingdon, 2019).

Third, the effective use of teaching and learning materials, especially digital and multimedia tools, should be trained to the faculty members. Professional development initiatives may not only improve the performance of teaching but also help educators to create more interesting and student-centered learning activities (Schindler et al., 2017).

Fourth, institutions ought to have mechanisms that involve routine review and modification of instructional materials to keep them in accordance with current academic and industry demands. Constant updating of the course content will increase relevance and learning outcomes.

LIMITATIONS OF THE STUDY

Although this study has made contributions, it has some limitations that must be noted.

To begin with, the research design was a cross-sectional study, and this type of design is not very effective in making time-related causal relationships. Future researchers can implement longitudinal designs to gain more insight into the change in academic performance.

Second, the convenience sampling methodology could have implications for the generalizability of the results, because the sample might not be representative of every institution of higher learning in Pakistan.

Third, the research was based on self-reported values, which can be affected by response biases and social desirability. The inclusion of objective academic performance measures, including GPA records, may help to increase the validity of future research.

Lastly, the research was limited to one independent variable (TLM) and did not consider other variables like the quality of teaching, student motivation, or even institutional support. These variables can be used in future studies to create a more comprehensive model (Hair et al., 2019).

SIGNIFICANCE OF THE STUDY.

This research has important theoretical, practical and policy implications.

Theoretically, the research adds to the current body of knowledge as it empirically confirms the association between teaching learning materials and academic achievement in the setting of a developing nation. It also promotes the existing learning theories by showing the significance of instructional resources in promoting effective learning.

Practically, the results will be of great value to teachers and administrators of institutions on the need to invest in quality teaching resources. Institutions can maximize student interaction and achievement by increasing the availability and accessibility of resources.

Policy-wise, the research provides evidence-based suggestions to the policy makers in enhancing the quality of education in Pakistan. The focus on creating and distributing teaching and learning materials fairly can help in the attainment of national and global education objectives, such as quality education for everyone (OECD, 2021).

All in all, the paper emphasizes that enhancing teaching and learning resources is a key measure that can be used to enhance academic outcomes and improve the quality of higher education.

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