To Investigate The Role of ICT in Enhancing Academic Performance of College Students

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Abstract

The purpose of this research was To Investigate The Role of ICT in Enhancing Academic Performance of College Students. For this, 360 students enrolled in intermediate and BS level in Model colleges of Islamabad were selected as study sample. Data was collected from the students through a questionnaire, which asked the students about the use of ICT and how its use has increased their academic performance. This questionnaire was made into a Google form and sent to the students' WhatsApp. Some students were asked to complete this questionnaire by email. The questionnaire data was collected in Google Forms, exported to an MS Excel sheet, and entered into SPSS. Regression analysis was done, and the results were extracted. The main objectives of this research were (a) to investigate the academic performance of students due to the use of ICT and (b) to determine the relationship between ICT adoption and the performance of college students. After applying the regression test, it was found that the academic performance of college students increased greatly with the use of ICT. A positive correlation was found between ICT and the academic performance of college students. It is recommended that (a) the use of ICT is essential to enhance the academic performance of college students. Integrate ICT with the curriculum in every college, (b) it is recommended that college students make full use of ICT to improve their grades and save time, (c) it is recommended that college teachers be given ICT training so that they can improve their teaching using ICT.

Keywords: Role of ICT, Academic performance, College students, Relationship of ICT and academic performance

Introduction

Information and communication technology (ICT) has been an important factor in the recent past in boosting productivity and new ideas in many different sectors throughout the world. More and more, the role of information and communication technologies (ICTs) in the classroom and beyond has been recognized by educators. This is particularly true for college students. Millions of dollars have been invested over the past two decades by the government and other education stakeholders, such as university administration and researchers, to incorporate ICT into the educational system (Lawrence, 2015). Since most universities have fully embraced ICT, learning approaches, instruction, research, and development have all seen enormous improvements. But how exactly these ICT apps influence students' productivity and achievement is still up in the air.

Adopting information and communication technology (ICT) is characterized in this study as a gradual but steady shift toward automating the educational process, which encompasses not only the creation of a one-of-a-kind learning management system (LMS) and the transfer of all relevant course materials and data to it, but also administrative tasks like student admission, registration, and evaluation. The institutions that made up the sample for this research have all used Blackboard as their learning management system. The LMS and all of its features, including the specialized online learning tools, are accessible to all staff and students on an equal basis. The quality of education in Pakistan has been substantially enhanced by the extensive implementation of learning management systems (LMS) (Khan et al., 2022).

As measured by their grade point average (GPA), students' academic performance encompasses not only their development as individuals and their progress from foundational to advanced coursework but also their overall academic success in school (Easton et al., 2017). To prove that there is a strong correlation between the two factors, we will look at academic performance in relation to the use of ICT.

Despite the abundance of literature on the topic, no study has been able to determine with any degree of certainty how exactly ICT influences students' academic performance. First, it is hard to determine students' actual performance since many studies' usual methods hold the curriculum responsible for students' performance success in terms of grades (Fu, 2013). Critics of this research, such as Ali et al. (2016) and Rose and Kadvekar (2015), contend that they ignore the influence of ICT on students' mindsets, skills, and competencies in favor of a curriculum-centric approach. In contrast to the more limited strategy, this one has been promoted by the authors as being more comprehensive and so more likely to produce reliable findings. A more intricate and all-encompassing plan to concentrate and monitor the job market is necessary, nevertheless, due to the scope of this technique.

The second obstacle is the rapid evolution of technology, which makes it hard to differentiate between the effects on people and their natural surroundings. As a result, there is much debate around this type of study because of the fear that the parameters utilized would become useless due to the fast pace of technological progress (Fu, 2013). Research comparing different approaches is also a common thread in the literature on this topic. The results of this research show that educational institutions might benefit from implementing ICT

systems. A few more recent studies have found successful effects and a positive attitude toward the growth of ICT; however, the majority of the studies have concentrated on cognitive outcomes.

Statement of the Problem

The issue description and the limitations in the literature review have led to the conclusion that further study into the impact of ICT on college student's academic performance is necessary. Much of the impact of ICT is being seen in the present developed era. An important role of ICT is being seen in every field, and it has many roles in education as well. This research was designed to look at this role. The results of this research will be of great benefit to stakeholders, policymakers for colleges, and teachers. It will also pave the way for new researchers.

Objectives of the Study

1. To investigate the academic performance of students due to the use of ICT
2. To determine the relationship between ICT adoption and the performance of the college students

Research Questions

1. What is the academic performance of students due to the use of ICT?
2. What is the relationship between ICT adoption and the performance of college students?

Literature Review

In this part, we review the results of previous research that looked at how using ICT in higher education affected students' grades. A number of research have looked into the connection between ICT and educational quality. Research on the effects of information and communication technologies on the quality of higher education is sparse compared to that of other areas where these technologies have had an impact. Similarly, similar research has come to contradictory results on how ICT impacts college students' academic performance.

Academic success, the teaching process, and innovation are all interconnected parts of higher education pedagogy, according to Ellis and Loveless (2013). Research like this proves that we cannot discount the impact that ICT might have on universities. Similarities are also found in the work of Chan et al. (2013). In order to meet the evolving demands of graduate students and democratize higher education, it stresses the critical role of information and communication technologies.

Sari and Mahmutoglu (2013) found that in order to suggest student-centered initiatives as a way to change university teaching approaches, a paradigm shift is required. The authors state that the new method should turn the student into an active rather than a passive participant in their learning, provided that the tutorial team provides adequate and suitable coaching. To a similar extent, Iniesta-Bonillo et al. (2013) discovered that students are more engaged and that tutorial help is more effective and efficient when it makes use of information and communication technologies.

Therefore, all relevant stakeholders in the higher education industry have made a

tremendous effort to integrate ICT into university curricula. Findings from a 2013 study by the UNESCO Institute of Statistics show that educational institutions throughout the globe have invested heavily in information technology (IT). Research on the effects of using ICT in classrooms has been extensive, spanning both theory and practice (Castillo-Merino & Serradell-López, 2014).

Modern theoretical frameworks investigating university ICT use have focused only on academic success. Different frameworks have used these performance measures to find out how things like infrastructure and resource availability affect things. Early and late in the process, a handful of studies have taken institutional culture and the implementation process into account (Castillo-Merino & Serradell-López, 2014). Evidence of the remarkable success recorded at the advanced levels, namely the worldwide and national levels, is the establishment of rules and regulations that allow the integration of ICT in the education system (Attuquayefio & Addo, 2014). In higher education, both administration and faculty are always seeking new methods to improve student outcomes via the strategic use of information and communication technology in the classroom. Nevertheless, it is not simple to determine the tangible results of these endeavors, which have to be demonstrated as outcomes supported by the ICT or as effects of its incorporation.

Much study has been focused on the impacts of this ICT application on education and its effectiveness. The SITES project, funded by the IEA (International Association for the Evaluation of Education Achievement), has evaluated and recorded the efficient utilization of ICT in 26 nations worldwide (Voogt et al., 2013). Examining the practices of school administrators, teachers, and ICT personnel in relation to the configuration of various devices across various platforms is the primary objective of this research. In contrast to previous research that has focused on students' perceptions of ICT's impact on their performance, this study adopts a teacher-centered approach (Croteau et al., 2015) and does not explicitly investigate this question. Similarly, Cruz-Jesus et al. (2016) summarizes many studies that look at how ICT has impacted schools in Europe. According to the findings, evidence about the impact of ICT on students' performance is scant and unmatched. However, none of these studies have shown any evidence that pupils' academic performance increases when ICT is used in the classroom. Because every study used a unique methodology, it is also more challenging to generalize the findings to all of the countries included.

The impact of information and communication technologies on classroom instruction has been the subject of several follow-up investigations. Solar et al. (2013) found that when schools use ICT, student learning and instruction improve. The results of this study corroborate those of Gallego et al. (2015), who argued that in order for a country to increase the standard for educational excellence effectively, it needs tough and efficient regulations and policies on information and communication technology. Research conducted independently by Babaheidari and Svensson (2014) suggests that the impact of ICT on school outcomes remains uncertain. According to Lin et al. (2014), there is limited evidence that using ICT in the classroom makes a big difference. Additionally, research has shown mixed results when it comes to the use of ICT in the classroom; some studies have shown beneficial impacts (Wastiau et al., 2013), while others have shown no effects at all (Venkatesh et al., 2014). This discrepancy is due to the fact that these studies have depended on students' socioeconomic backgrounds and the fundamental qualities of the school. Previous studies'

inconsistent results only highlight the dearth of robust theoretical research supporting the benefits of ICT implementation. As a result, the impact of ICT on classroom instruction has not been adequately studied.

Some other researchers have used qualitative approaches to determine if pupils' performance increased after utilizing ICT while looking at the issue from a national viewpoint. As an example, whereas Wastiau et al. (2013) investigated the effectiveness of education in Europe, Macharia and Pelser (2014) investigated the same in Africa. The results of this research are contradictory since they examine different aspects of the impact of ICT on university students' performance. Furthermore, they have created a knowledge vacuum as no research has investigated the correlation between students' ICT usage and their academic achievement, with students' gender, grade point average, or IT major acting as moderating or dependent factors. Similarly, there is research on students' academic performance, although studies investigating the impact of ICT on students' grades in higher education are scarce. That is the complete lack of information that our research aims to fill.

Research Design

The survey method was used for this research; after collecting data from the students, the academic performance of the students was checked by putting it into SPSS and using ICT. For this purpose, a questionnaire was created in which the children were asked questions related to the use of ICT and their academic achievement. The relationship of ICT to children's performance was checked.

Population

Students enrolled in intermediate and BS levels in Model colleges of Islamabad (Shah, 2018)

Sampling Techniques & Sample Size

A simple random sample technique was used to draw the sample size of the study. So, the sample size of the study was 360 students; as per Krejice and Morgan's 1970 table, a sample size of 360 students is enough for a population of 6706 students (Morgan, 1970).

Research Instrument

The study instrument utilized to gather data from respondents was the questionnaire. With the following options available on a 5-point Likert scale: Strongly Disagree (SDA-1), Disagree (DA-2), Undecided (UND-3), Agree (A-4), and Strongly Agree (SA-5), the 30-item questionnaire was meticulously crafted. Google Docs was used to create the survey.

Pilot testing

Three professional experts validated the designed questionnaire. The sample size for pilot testing was 30 students from colleges that were conveniently selected. Moreover, the reliability of the instruments was also checked using the coefficient of Cronbach's alpha. The value of the coefficient of Cronbach's alpha was .89.

Data Collection

For this research, the questionnaire was sent to the students on WhatsApp, and they were

asked to fill it out; in this way, all the data was collected on Google Forms, exported to MS Excel sheets, and then analyzed on SPSS.

Data Analysis

After the data was collected, it was put into SPSS, and then regression analysis was done on it. The impact of ICT on children's performance was checked. Three tests of regression analysis were applied, and the results were extracted.

Results and Discussion

Table No. 1 Regression Analysis Use of ICT and Academic Performance of Students (Model Summary)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562[a]	.311	.309	.803

a. Predictors: (Constant), Use of ICT

Table 1 indicates the regression analysis of ICT and the academic performance of students. According to the data analysis of the model summary, the R-square value was 0.311, which showed that ICT caused a 31.1% change in the academic performance of students.

Table No. 2 Regression Analysis Use of ICT and Academic Performance of Students (ANOVA)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.873	1	62.864	106.354	.000[b]
	Residual	185.656	359	.494		
	Total	248.529	359			

a. Dependent Variable: Academic Performance of Students
b. Predictors: (Constant), Use of ICT

Table 2 indicates the regression analysis Use of ICT and Academic Performance of Students. According to the data analysis of ANOVA, the $p<0.05$ showed a significant relationship between the Use of ICT and the Academic Performance of Students.

Table No. 3 Regression Analysis of Use of ICT and Academic Performance of Students (Coefficients)

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.442	.351		6.276	.000
	Use of ICT	.807	.078	.562	10.448	.000

a. Dependent Variable: Academic Performance of Students

Table 3 indicates the regression analysis Use of ICT and Academic Performance of Students. According to the data analysis of Coefficients, the value of beta was .562, which showed a positive relationship between the Use of ICT and the Academic Performance of Students. In other words, it indicates that if the Use of ICT interacts with one unit, then the Academic

Performance of Students will increase by 56.2% positively.

Conclusion

It was concluded that in the regression analysis of ICT and the academic performance of students, the R-square value was 0.311, which showed that ICT caused a 31.1% change in the academic performance of students.

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It was concluded that the regression analysis of the use of ICT and the academic performance of students, as well as the data analysis of coefficients, had a beta value of .562, which showed a positive relationship between the use of ICT and the academic performance of students. In other words, it indicates that if the Use of ICT interacts with one unit, then the Academic Performance of Students will increase by 56.2% positively.

Recommendations

1. It is recommended that the use of ICT is essential to enhance the academic performance of college students. Integrate ICT with the curriculum in every college.
2. It is recommended that college students make full use of ICT to improve their grades and save time.
3. It is recommended that college teachers be given ICT training so that they can improve their teaching using ICT.

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