

The Role of ICT Resources Available to Students Influencing their Academic Performance: A Comparative Study between Private and Public Schools in Sindh-Pakistan

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Abstract

In today's digital age, Information and Communication Technology (ICT) resources play a crucial role in shaping students' academic performance. This comparative study aims to analyze the impact of ICT resources on students' academic performance in both private and public schools in Larkana Sindh, Pakistan. The study utilizes a quantitative methodology, collecting data through questionnaires administered to 100 students using stratified random sampling. This study used Smart PLS 4.0 for Data Analysis. The questionnaires assess the availability and utilization of ICT resources, including computers, internet connectivity, and educational software. Additionally, student records provide insight into academic achievements. The research sheds light on disparities in access to and utilization of ICT resources between private and public institutions. It underscores how resources in private schools contribute to an enriched learning experience and improved academic performance. Conversely, public educational institutions in Sindh often encounter challenges in providing adequate ICT resources, which can negatively impact academic achievement. By highlighting these discrepancies, the study emphasizes the importance of addressing inequities in ICT resource allocation. Policymakers and educators must work to ensure that all students, regardless of school type, have equal access to ICT resources. Bridging this gap is crucial for enhancing students' academic success and preparing them for the demands of the digital era.

Keywords: ICT resources, academic performance, Sindh, Pakistan, private and public schools, colleges

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Introduction

Today the education is highly benefited from the ICT where ICT tools assist learners in achieving academic success and at the same time reducing the digital divide among them.

In the community analysis conducted by Youssef, Dahmani, and Ragni (2022), the students are more and more demanding in terms of the incorporation of ICT applications to help develop other relevant skills for their learning process. Due to the applicability of ICT tools that includes

computer, laptop, Tablets, projectors, and mobile phones, students can have many learning activities and the education experience inside and outside the classroom is improved (Nikolopoulou, 2022; Afaq et al., 2022).

Several international research works support the fact that promotion of ICT benefits enhances the connection between ICT usage and academic performance, which includes classroom participation and test, scores (Waiganjo & Paxula, 2020; Sibte-Ali et al., 2024; Ishfaq et al., 2024). This balance between technology integration and learning serves to support why students should be provided with ICT equipment's to help them transform certain tasks into optimized activities.

However, access to technologies and teachers' assistance is not equal meaning that implementation of such a method in regions like Sindh in Pakistan comes with a number of difficulties. In the public schools, merely having the computers on their desks is not enough; if left on their own, students do not know how to get as much from these tools as is possible for their learning (Adil, 2024; Marquardt & Kearsley, 2024). Also, recurring challenges such as power outages also reduce the capacity to integrate the available technologies, which students cannot exploit for their progress in class (Alieto, 2024; Haleem et al., 2022).

On the other hand, private schools are likely to enjoy a more conducive ICT environment, where resources are available, there is stable electricity supply, and the teachers are capable of deploying technology in realizing effective teaching practices (Ndahayo & Ndayambaje, 2024). Nevertheless, some issues linger, for example the availability of computers is still an issue and there is a differential level of teachers' computer literacy; this slows down the effectiveness of ICT in the improvement of educational achievement (Brenya, 2024; Emezirinwune, 2024; Shah et al., 2021b).

Moreover, the standardization of education through implementation of curriculum in public schools explicitly unify the practices but implicitly restrain the creative teaching learning activities and approaches (Seenivasan, 2024; Shah et al., 2021a). Since educational systems are transforming globally and especially after the breakout of Covid-19 by shifting to online learning, the necessity for analysing the influence of ICT on students' achievements still remains paramount (Wang and Chen, 2024). The purpose of this study is to provide exhaustive analysis of impact of ICT on students' academic performance in public as well as private sector of education to support the reformist agenda in the sphere of education and the integration of information and communication technologies into practices of teaching-learning.

Statement of the Problem

In today's society Information and Communication Technology is an important aspect of the learning process. But as far as Pakistan is concerned, both the public as well as private

colleges and universities face many problems in the practical management of ICT. Some of the challenges include the unavailability of infrastructure and supportive technologies; many schools and colleges currently have poor or no internet connection, no computers and other learning supporting ICT facilities hence the effectiveness of the use of technology depends on the amount that both the teacher and the learner can optimally exploit Bouasangthong et al. (2024)

However, inequity exists in using ICT resources between public and private sector education systems in Sindh, Pakistan; the implication of this deserves educational equity discourses. Unfortunately there is a big gap between private college and universities and public institutions in terms of ICT infrastructure and trained personnel. Besides the impact to students' academic achievement in public Institutions, this inequality contributes to the general education divide (Luo et al., 2022). It is crucial to rectify this problem in order for all learners irrespective of the institutions they attend gain the benefits that come with the use of ICT in education. This research therefore seeks to establish the effect of this ICT imbalance on the students' performance with the end view of addressing resource issues and informing policy reforms.

Research Objectives

1. The purpose of this research study is to establish a comparison and determine the status of quality and accessibility of ICT resources in public and private educational institutions of Sindh, Pakistan.
2. To examine the relationships between the integration of ICT resources and students' performance in public as well as private school in Sindh, Pakistan.

Research Questions

1. How does the quality and accessibility of ICT resources varies in public and private school in Sindh, Pakistan?
2. In what way does academic performance in Sindh's FIG and Pakistan's private sector schools, colleges and universities stand with regard to usage of ICT resources?

Hypotheses

1. This research provides an overview of the availability and quality of ICT resources in public and private schools within Sindh region of Pakistan.
2. An analysis of the result revealed ICT resource usage is highly significant with the performance of learners within both public and private schools in Sindh, Pakistan.

Literature Review

The Role of ICT in Enhancing Academic Performance

1. ICT is almost part of learning environment and with the effect being clearly seen and researched on a number of students' academic performances. Key findings from the literature: There is evidence of accumulating support for the notion that ICT can be effective for enhancing educational performances with some conditions and contingencies.

2. Basri et al. (2018) examined the implication of using ICT within the Saudi universities and its impact to students' performance. Measuring with structural equation modeling (SEM) and path analysis using AMOS tool, they noted the existence of positive significant ICT and academic achievements in conservative context. However, fear in the class was lower with female students indicating improvement in academic performance more than the male students. The study also found that students' majors, especially IT disciplines, did not affect the academic performance; the author pointed out that ICT provides benefits across all fields. This evidence supports the possibility of ICT in the improvement of learning but at the same time bring into focus the possibility of possible enhanced leaning depending on gender and other demographics by adoption of proper approach on the use of ICT (Basri, Alandejani & Almadani, 2018).

3. Mwangi and Shouwei (2023) specifically singled out ICT literacy as a ush for the academic performance in the public universities in Kenya. In using the combination of the qualitative and quantitative research, they discovered that students who have better, enhanced ICT literacy level as a mean of facilitating learning got better grades than those students who had low levels of ICT literacy. But they also recognised that students attaining higher ICT literacy correlate with greater job performance provided that they teach well, have the requisite instruments and resources, and that the students are coached and learn in this kind of environments. Their research as well highlighted the fact that even though, ICT infrastructure is one of the most common factors: the extent to which these infrastructures improve performance depends to a large extent with how well they have been integrated into the education system; this study reported an R^2 of 22.6% for ICT infrastructure as a predictor; Mwangi and Shouwei, 2023.

4. Jamali (2023) analyzed the impact of ICT on student performance based on the extended Technology Acceptance Model (TAM) which was used on the higher education institutions (HEIs) in Sindh, Pakistan. ICT however was found by his study to require more appropriate incorporation into the formal education theories. Given the efforts made by Pakistan's Higher Education Commission (HEC) in increasing investment in ICT infrastructure, a knowledge@HEC paper reveals a lack of comprehension as to exactly how ICT utilization suppl

ports academic performance improvements. The study emphasized the need to provide recommended strategies for incorporation of ICT that took into account students' difficulties in using these tools (Jamali, 2023).

5. Safely, Dahmani and Ragni undated explored digital divide trends on the French university Students and performance. According to their research the consequence showed that minimal investment on ICT held student achievement back while training programs merely had little impact on the students' scores. This concept of architectural ICT was not about the causal relationships between ICT and performance that had been relied upon earlier; it was about the synergistic and creative application of ICT in achieving performance advancements. Acquiring digital skills also emerged as clear indication from this study that compelled the academic performance. This paper reveals that there is still a digital divide in the French university context requiring organizational improvements on how instruction and technology can be enhanced using ICT (Youssef, Dahmani, & Ragni, 2022).

The Impact of ICT Resources on Student Learning

6. Research as to the involvement of ICT in improving students' learning and achievement is most widespread due to the introduction of new technologies into learning processes. ICT has revolutionized the style of learning by providing an easy, interesting and productive learning environment.

7. Hori and Fujii (2021) investigated the ICT usage in relation to students' self-efficacy and persistence by employing the dataset of the 2018 PISA. According to their studies, students who often used ICT for out of school learning especially in school projects had more self-efficacy and more perseverance. However, the usage of ICT in school environment did not show such positive consequences, and the usage of ICT in recreation other than school environment, was again linked with lower persistence levels. This underscore the need to design learning activities to require the use of ICT beyond classroom in order to address learners' motivational needs. The study also recommends that teachers who aspire to deploy ICT in their teaching should develop trendy lessons which can foster explore more learning on their own, this is an implication that there is a need for more integrative views when applying ICT in learning settings (Hori and Fujii, 2021).

8. Zahidullah et al. (2024) followed up with another study examining the role of ICT in the transformative process of education, as a tool that had gone beyond fancy making towards becoming a descriptive element in the improvement of all spheres of educational practice. The study supported the idea that ICT enhances positive change in the teaching and learning processes based on the responses from post and graduate students, educational administrators, and others. Recognised as an enabler, ICT comprises internet facilities; and mobile gadgets such

as smart phones; and software applications have been found to improve educational gains. The study highlighted this by stating that ICT helps in proper share, enhancement and transfer and emphasized more on its importance in today's learning (Zahidullah, Wali, Baseer & Imaduddin, 2024).

9. Sudesh (2017) adopted the same approach of focusing on the global challenges towards ICT implementation in education. However, the utilisation of ICT for education has several barriers even if the role it plays in serving the purpose cannot be underestimated. The study of the barriers of the usage of the ICT in education revealed that lack of self-confidence and self-proficiency, lack of access to the required tools and equipments, and lack of adequate time were the major obstacles known to hinder the fruitful integration of ICT in the education systems. More importantly, the research highlighted the need for professional development, time for preparation and technology support for teachers to facilitate integration of ICT. Consequently, all the chances of ICT integration in teaching and learning will be greatly enhanced when the three aspects – confidence, competence, and resource accessibility – are well-coordinated. The paper ended with solutions for dealing with these challenges, especially appealing motivational and ICT based teaching approaches that could engage the students more (Sudesh, 2017).

10. Therefore, in this paper, the literature shows that ICT does work as a tool to facilitate student learning and increase outcomes provided I CT is delivered and applied in the right context. The findings suggest the possibility that the extra-curricular use of ICT is more effective in helping students persist and feel more effective, than if the use is during school time and leisure. However, the implementation of ICT in education is supplemented with some challenges that variously refer to teacher's preparedness and resource adoption. Subsequent endeavours to strengthen ICT use in education should incorporate these with reference to overall approaches to ICT integration in the learner and teacher interfaces.

Technology in Education and Student Outcomes

12. Use of technology in promotion of educational performance has perhaps been a popular aspect highlighted in research recently. Ferdian (2024) carried out a study on the use of technology for teaching and learning civic education in elementary schools and established that there is still poor use. Interestingly, while the more augmented technologies including the use of computers and other media are available, teachers continue to use more conventional forms of teaching like relevant lecture, PowerPoint presentation and videos more often than even using of computers. It also underscore the need to advance research on the use of digital media resources in enhancing the learning of civic education among students.

13. Complementarily, Sitohang (2023) explored the effect of the COVID-19 pandemic on student effectiveness via online learning. Several obstacles were identified by the transition to

online learning: a lack of internet connection or limited access and a low level of understanding of the course content. The study established that students' outcome does not differ between students learning online and students learning via face to face teaching. Based on the studies, it can be concluded that in as much as technology supplement education the barriers to its effectiveness are issues such as access and attention.

14. On the other hand, Hasanuddin et al. (2023) examined the effect of learning technology on entrepreneurial education and discovered that tools such as Presentation software significantly enhance student learning performance. One lesson learned from the study was that emotive as well as psychomotor technology enhanced better performances. From the results, it is clear that the implementation of technology has the possibility of improving the results of learning if applied appropriately to certain subject areas for example, entrepreneurship.

Conceptual Framework of Information Communication Technology

A conceptual model in this study is Technology Acceptance Model (TAM) that seeks to establish the impact of ICT resources on the students' performance. TAM claims that, among different criteria, perceived usefulness (PU) and perceived ease of use (PEOU) are the most important determinants of people's adoption and utilisation of technology. This investigation of the impact of ICT resources for enhancing performances in academic scores among private and public schools in Sindh, Pakistan thus employs the combined components of the proposed TAM conceptual framework.

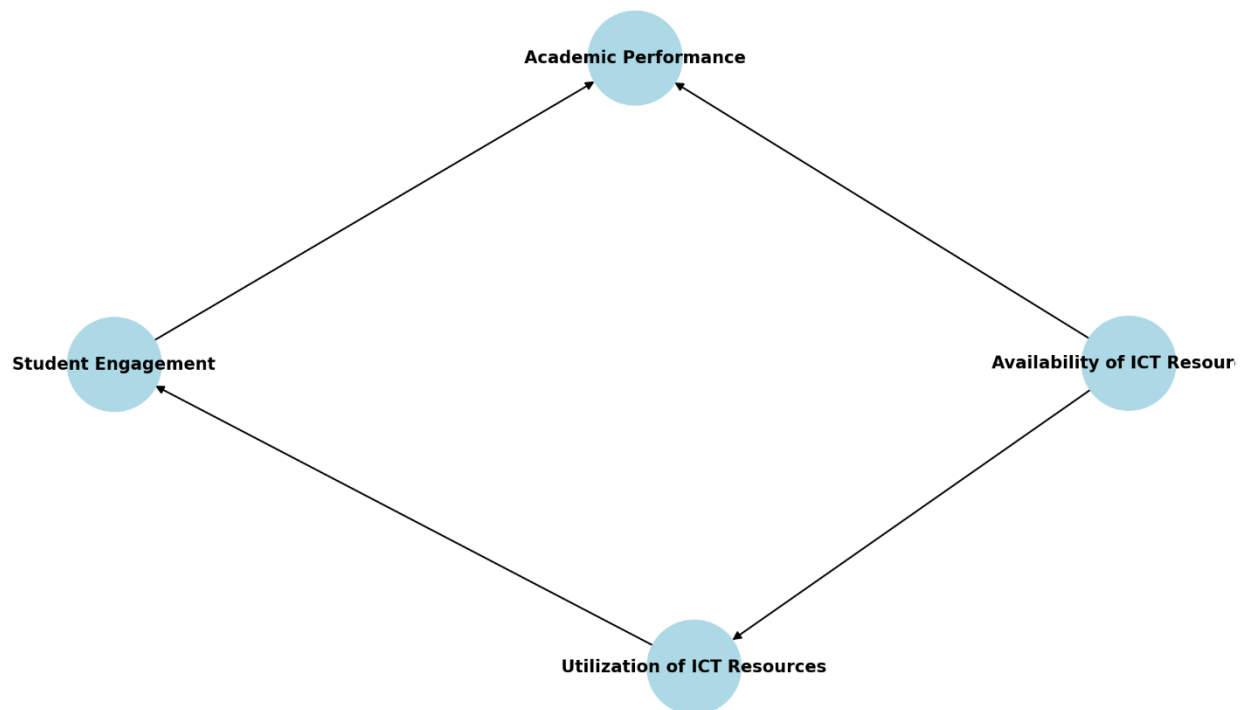
Constructs of the Technology Acceptance Model (TAM)

1. The term called perceived ease of use (PEOU) refers to the perceived ease by students that Information Communication Technology (ICT) resources are to be used. Perceived Usefulness (PU), which refers to the extent to which students' perceive the use of ICT resources enhances their performance and learning.
2. Variables of ICT Resources: ICTCS, availability of ICT resources (AIC) has been used to measure accessibility of ICT tools which includes; computers, the internet and instructional software. Constructive Use of ICT Resources (CUIR) measures students' ability to harness technology to his or her benefit in learning processes. Use of ICT Resources (UIR): Looks at how often and what type of ICT resources are employed by the students.
3. Academic Performance (AP): Demos the marks that pupil has worked for and obtained including the tests.

4. Moderating and Mediating Factors: Institution Type (Private vs. Public): The respondent's scores on ICT resource variables and academic performance may mean that the effect vary depending on whether or not the institutions belong to the private or public domain.

5. Difficulties with Using ICT Resources: This means that the relationship between ICT and academic achievement may be confounded by technical breakdowns or poor ICT resource literacy.

Conceptual Model: ICT Resources and Academic Performance



Davis' technology acceptance model (TAM)(1989).

Methodology

The study carried out sought to establish the impact of Information Communication Technology (ICT) on students' performance in education in Pakistan with special reference to both public and private sectors at higher education level. This research was a quantitative one that employed a survey which was conducted among a randomly selected group of students from various public and private college. Questionnaires with Likert scale were used to collect data with the students being asked to use a 5 Likert scale to respond to the questions. The scale contained 5 points to indicate the students' perception on the ict subject. Technology (ICT) on the academic performance of students in Pakistan, encompassing both public and private

educational institutions at the higher education level. This study involved a quantitative research approach, utilizing a survey that was administered to a randomly selected group of students from various public and private colleges. Data collection was carried out through a Likert-based questionnaire, where students were provided with a 5-point Likert scale to indicate their responses. The scale consisted of 5 points for students to express their opinions on the ict subject.

It is important to note that the issues of ethics played great role and their application were fulfilled in the levels where all participants were informed about the aims of research, as well as their responses were guarded. In order to increase the response rate, students were informed that their data will not be used for any other purpose other than academic and research. Consequently, the convenience sampling technique was adopted and all considered; 3 schools formed the sample size for this research study.

Content validity

The validity of content of the questionnaire was ensured from the view point that all aspects of I.C.T integration in education was captured. The items were reviewed by a panel of ICT specialists and educators teaching at the Gareebabad Primary School, Government Girls High School Lahori Muhalla, City School, IBA Public School Sachal Colony. It was a key measure that their input made it possible to design the questionnaire that captures the domain of ICT elements. This process increased the validity of the instrument as it assured whether these items were rightly measuring what we intended them do.

Data Analysis

Data for the current study was analyzed Smart PLS. The first research question was therefore to review the literature in order to analyze the correlation between ICT resources accessibility and use, and students' performance. The study employed hypothesis testing by structural equation modeling (SEM) to explain the main effects and the moderation effects of the factors on performance. Preliminary to hypothesis testing, a descriptive analysis was done on key variables as a way of getting a snap-shot view of the data pensively covered ICT integration in education. A panel of ICT specialists and educators from Gareebabad Primary School, Government Girls High School Lahori Muhalla, City School, and IBA Public School Sachal Colony reviewed the items. Their feedback ensured that the questionnaire adequately represented the domain of ICT elements. This process confirmed that the items measured what they were intended to measure, enhancing the overall validity of the instrument.

Data Analysis

The data for this study were analyzed using, Smart PLS. The primary objective was to examine the relationships between the availability and utilization of ICT resources and students' academic performance. The analysis involved hypothesis testing using structural equation modeling (SEM) to understand the direct and interaction effects of various factors on academic performance.

Descriptive Analysis

Before hypothesis testing, a descriptive analysis was conducted to summarize the key variables. This involved computing the means and standard deviations of the availability of ICT resources (AIC), the constructive use of ICT resources (CUIR), and the utilisation of ICT resources (UIR), as well as students' academic performance (AP).

Reliability and Validity

Cronbach's Alpha and composite reliability were established to check reliability and validity of the dimensions of the constructs composite reliability were calculated. Constructs all have practical and adequate reliability because all Cronbach alpha values are greater than the 0.7 benchmark. Furthermore, the reliability for each construct was checked employing the Average Variance Extracted (AVE) that had a value more than 0.50 – thus justifying convergent validity. • The findings have shown that students 'ICT resources usage does affect their performance in class but in a different way depending on the manner in which they will use these resources. acceptable reliability, with Cronbach's Alpha values above 0.70. Additionally, the Average Variance Extracted (AVE) for each construct exceeded the threshold of 0.50, confirming convergent validity.

Interpretation of Results:

The results indicate that the availability of ICT resources positively influences students' academic performance, but the impact varies depending on how these resources are utilized. Constructive use of ICT hence results in improved academic results on the other hand inefficient use of technologies results in poor results. The findings of the interaction effects provide empirical evidence that the effect of ICT resources on academic performance is mediated by other attributes.

Interpretation of Findings

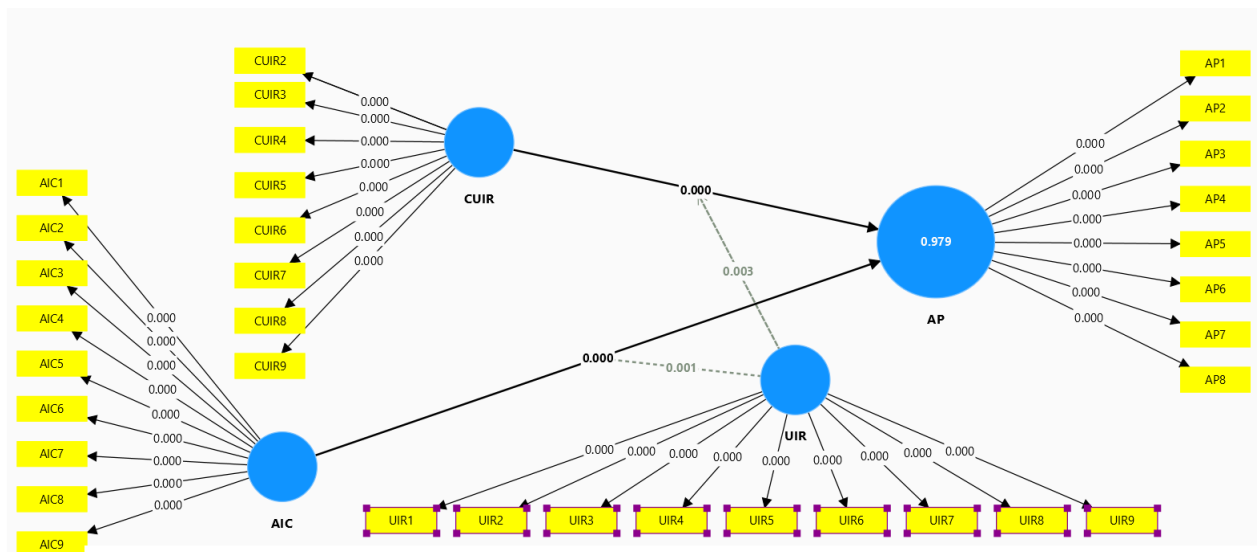


Table 1: Smart PLS Estimates

Hypothesis	Relationships	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P-values	Accepted / Rejected
H1	AIC → AP	1.075	1.074	0.073	14.74	0	Accepted
H2	CUIR → AP	0.423	0.429	0.106	3.993	0	Accepted
H3	UIR → AP	-0.52	-0.525	0.114	4.579	0	Accepted
H4	UIR x AIC → AP	-0.257	-0.27	0.078	3.288	0.001	Accepted
H5	UIR x CUIR → AP	0.247	0.258	0.083	2.976	0.003	Accepted

Hypothesis 1: AIC → AP (Availability of ICT Resources → Academic Performance)

Interpretation

It is clear that the coefficient for availability of ICT resource (AIC) is positive and equal to 1.075 suggesting that it tends to have a strong relationship with the performance of the students (AP). The implication of this is that as the level of ICT resources available to the students rises dramatically, students' performance sky rockets. This result corresponds to the high T-statistic (14.74) and highly insignificant p-value of 0 indicating that this hypothesis has a high possibility to hold true.

Hypothesis 2: CUIR → AP (Difficulties Encountered when Applying ICT Resources → Academic Achievement)

Interpretation:

Conversely, the negative coefficient (-0.422) indicates that the balance between the availability of and demand for ICT resources (BIDA) slightly and negatively affects performance (AP). It may also be the case that if people overcome challenges associated with use of ICT, then there could be a positive change in student performance. The calculated T-statistic of 3.993 suggest that this relationship is both statistically significant at 0 level of significance thus accepting the hypothesis.

Hypothesis 3: ICTQ -> AQ (Information and Communication Technology Quality -> Academic Quality)

Interpretation

Again the findings show a strong negative correlation with coefficient value of -0.52 between the UIR and the AP on the part of the technical University students. This implies that high usage of the ICT resources; might lead to reduction in performance since the usage may be efficient or exceeds the optimum level. The high calculated T-statistic is equal to 4.579 and p-value is also equal to 0 which means that this relationship is statistically significant and therefore the hypothesis is accepted.

Hypothesis 4: UIR x AIC – AP (Utilization of ICT Resources x Availability of ICT Resources – Academic Performance)

Interpretation:

As expected, the coefficient for the interaction term between the UIR and the AIC, both scaled, is negative (-0.257). In the context of the research questions, this realisation means that interacting high utilisation with high availability of ICT resources is likely to produce the negative impact indicated by the U-shape. The result show that the T-statistic is 3.288 for which p-value is 0.001 and hence the hypothesis is accepted implying that the interaction effect is statistically significant.

Hypothesis 5: CUIR -> AP x UIR -> Challenges in Using ICT Resources -> Academic Performance

Interpretation:

The positive coefficient (0.247) of the interaction utilization (UIR), challenges in using ICT resources (CUIR) indicate that when students use the ICT resources efficient in moderating the challenges in using the ICT resources, a positive improvement of the academic performance may be expected. It is statistically significant that this interaction effect, because the T-statistic of 2.976 and the p-value of 0.003.

Results

The study brought out new empirical evidence on how free and paid ICT resources influence attainment of academic goals. A conclusion was made that better students' outcomes for pupils are associated with enhanced availability of ICT facilities. It did opine, however, that having access to these tools is not enough. ICT is essential for students and inadequate or extramural utilization exhibits the potential to reduce their performance output. On the other hand, where pupils experienced challenges when using ICT but sought and succeeded in managing them found to have better academic achievement. Thus, the *int* *můžeme* *vidyélítíthat*, *kfedé* concluding that increased use of ICT eliminates certain obstacles can enhance the students' problem-solving skills and, consequently, their academic performance. Therefore, the study underscores the need to ensure both availability and effective utilization of the ICT resources.

Discussion

Using the analysis of the dialogue, it is possible to conclude that the relation between academic success and ICT materials is rather ambiguous. The study also shows that while it is important to be connected to ICT resources, how these devices are exploited, is equally important. If teachers do not explain how students can gain from using ICT technologies, then the students may not understand the beauty of ICTL. Misuse of ICT resourced can lead to poor attention span, distractions and probably drop in performance. At the same time, as practice shows, if students faced some issues in using ICTs, it becomes the opportunity to develop essential skills such as, for example, flexibility and problem-solving skills. These abilities are beyond price and can readily enhance academic performance. As a suggestion, the discussion wants educational institutions to focus on providing ICT tools as well as training in their proper use to the learners.

Implications of the Study

1. Establish Targeted ICT Training Programs: Academic institutions ought to design customized ICT training courses that give students the know-how to use ICT tools for learning.
2. Integrate ICT into Curriculum Design: To ensure that students understand how to use these tools to boost learning across a variety of courses, policymakers and educators should incorporate ICT training and usage into the curriculum.
3. Encourage Purposeful ICT Usage: Educational institutions should stress the value of utilizing ICT tools for particular learning objectives, assisting students in interacting with these resources in a way that directly benefits their academic performance.
4. Provide Support Systems to Help Students Overcome ICT Challenges: In order to minimize disruptions to learning, support systems should be put in place within institutions to help students overcome technical issues and other challenges linked to ICT usage.

5. Monitor and Control ICT Use: To ensure that students retain a focused and balanced approach to their studies, educational institutions should put in place monitoring mechanisms and rules to avoid the excessive or non-educational use of ICT resources.
6. Educators Should Receive continuing Professional Development in ICT: Teachers and educators should be provided with continuing professional development to remain current on the newest ICT tools and techniques. This will allow them to assist students in making the most effective use of these resources.
7. In order to improve student engagement and academic results, educational institutions should encourage the use of ICT for collaborative learning activities including group projects and online debates.
8. Enhance Institutional ICT Infrastructure: To guarantee that all students have dependable access to top-notch ICT resources, policymakers should place a high priority on investments in strong ICT infrastructure within educational institutions.
9. Regularly review the Impact of ICT: Educational establishments should regularly review the impact of ICT utilization on student learning outcomes, making necessary adjustments to tactics to optimize gains.
10. Encourage a Balanced strategy to ICT Integration: The study emphasizes the necessity of a strategy to ICT integration that is balanced, maximizing the advantages of technology while minimizing any potential negative effects, such as overuse or dependency.

Limitations and Future Research

1. Limitation on Geographic and Institutional Context: Because the study was carried out in a particular geographic and institutional context, it's possible that the results can't be applied to other educational environments.
2. Research in Diverse Educational Environments: To further understand how these factors may affect outcomes, future research should examine the effect of ICT resources on academic achievement in a variety of educational environments, including elementary schools, rural areas, and diverse cultural contexts.
3. Longitudinal Studies for Long-Term Effects: In order to provide a more complete picture of the sustained influence of ICT usage on students' performance, longitudinal research is required to investigate the long-term effects of ICT usage on academic outcomes.
4. Studying Particular ICT Tools and Applications: Upcoming studies ought to concentrate on determining which particular ICT tools and applications are most useful for improving learning, as this will enable educators to modify their methods to optimize their advantages.
5. Integration of ICT in Different Educational Practices: More research is needed to determine how best to include ICT tools into various educational practices, as well as how to make the most of their use in a range of teaching and learning environments.

Conclusion

Based on these findings, this study agrees that there is a potential of ICT resources on the academic performance especially but how they are utilised has the largest bearing. Source here pointed to the availability of ICT resources but also to the emergence of new uses on a large

scale, done by students. As pointed out in the study, input into educational effort therefore needs to be guided towards a facilitating both a permissive direction and an incentive direction that feeds as opposed to using up, more and aggrandized ICT assets. This involves enhancing ICT training, support/counselling with regard to use of the technology, in order to facilitate a well-balanced approach to its application (lest it be overused or misused). The study also also establish the important of enhancing competency skills within learners in managing challenges relating to ICT usage as it was Appropriately Visible from.

Ethical considerations

Ethical considerations play a crucial role in the use of information communication technology (ICT) in both public and private sectors. As technology continues to advance, it is important for organizations to consider the ethical implications of their actions.

In the public sector, ICT is used to improve efficiency and transparency in government operations. However, the collection and storage of personal data raise concerns about privacy and security. It is essential for governments to establish clear guidelines and policies to protect the rights of citizens and ensure that their data is used responsibly.

In the private sector, companies must also consider ethical issues related to the use of ICT. This includes issues such as data privacy, intellectual property rights, and the impact of technology on society. Companies must be transparent about how they collect and use data, and they must ensure that their technology is not used to harm individuals or communities.

Overall, ethical considerations are vital in the use of ICT in both public and private sectors. By taking a proactive approach to ethical issues, organizations can build trust with their stakeholders and contribute to a more responsible and sustainable use of technology.

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