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Assessing the Relationship Between ICT Integration and Academic Performance Among University Students in Andahuaylas, Peru

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Abstract

This study investigates the impact of Information and Communication Technology (ICT) integration on the academic performance of university students at the University of the Andes in Andahuaylas, Peru, during 2023. Surveys were used to evaluate the utilization of ICT tools including forums and tasks and videoconferencing in a study involving 140 university students. The research data indicates that 64.3% of participants demonstrated advanced skills in ICT integration and 79.3% exhibited high task participation. Academic performance displayed a substantial positive link to ICT integration based on the analysis results (r = 0.895, p < 0.01). The data indicates that students who use forums generate the highest impact on their academic performance based on a coefficient of 0.238 (p < 0.000). The current analysis demonstrates that task engagement values contributed significantly (p < 0.000) along with a coefficient value of 0.201. Academic performance shows improved results with ICT tools specifically forums and tasks and this discovery redefines educational strategy development as well as digital tool execution in higher education settings.

Keywords: ICT Integration, Academic Performance, Forums, Tasks, Videoconferencing, University Students, Peru, Quantitative Research, Higher Education, Educational Technology.

Introduction

Information and Communication Technologies have transformed 21st-century educational spaces as the primary driver of student learning methods and content interaction and instructor-student relationships. The tools included in ICTs comprise both online communication software and digital learning spaces with Internet access and downloadable applications that modernize educational instructional methods (Samoylenko et al., 2022; Dudar et al., 2021). The emerging digital era pushes educational systems across the globe to use ICTs as their main approach for enhancing classroom education and student learning processes. Higher education organizations across Latin America face both promising opportunities and pertaining obstacles in their

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adoption of modern technology because their classrooms display various degrees of digital tool implementation (Okoye et al., 2023).

Education in Peru experiences a growing urgency to implement ICT because teaching modernization and workforce digital skill development demands the change. The Andes Technology University (Universidad Tecnológica de los Andes) operates in Andahuaylas, Peru along with many other institutions worldwide under this trend. The academic model of this university included integrating information and communication technology tools which provide students with access to educational materials and multiple online learning possibilities including virtual class participation (Kituyi and Tusubira, 2013). Accelerated adoption of remote learning during the pandemic pressed colleges and universities to incorporate ICT at higher levels in their education delivery. A significant portion of Peruvian students utilizes these instructional tools, yet researchers have not fully mapped the performance implications of ICT implementation in Peru. Educational success depends heavily on academic performance metrics within any learning system (Alyahyan and Düştegör, 2020). Historically academic success is determined through examination results together with projects and assignments. New methods emerged after the introduction of ICTs to evaluate student involvement and their ability to collaborate as well as educational progress (Awidi and Paynter, 2024). Students can improve their academic achievements through utilizing ICT tools which deliver dynamic interactive and accessible learning platforms such as online forums together with videoconferencing and tasks (Berezi, 2025). The influence that technology has on academic achievement among students continuously sparks academic discussion between researchers (Khattak & Abukhait, 2024). Research shows that Information and Communication Technologies enable students to obtain better resources and build better collaborative relationships and connect with instructors and peers in different ways. Some scholars believe excessive dependence on technology creates negative effects which include diminished educational quality and reduced face-to-face interaction and increased distractions. Research about ICT effects on university students' academic results becomes essential as these technologies gain increased relevance for educational success. The study concentrates on University of the Andes Andahuaylas undergraduate students during 2023. The research seeks to understand how the integration of three ICT tools (forums, tasks and videoconferencing) influences the academic performance of students studying different university programs. This research stands out because it presents an opportunity to reveal important links between ICTs and students' academic achievements. Resources to optimize learning outcomes through technology will become more effective when educators and policymakers determine which ICT tools generate the greatest learning effects. The study provides valuable information to both the university and educational organizations in Peru along with Latin American institutions as they construct decisions regarding ICT infrastructure development along with faculty training and digital learning platform creation.

This study is guided by several key research questions, which include:

What is the relationship between the integration of forums and academic performance?

Online and hybrid learning platforms use forums as a common communication tool for students to engage in discussion and exchange educational resources in addition to peer-learning activities. The research examines if joining online forums actively results in better academic results through increased student involvement and enhanced comprehension of curriculum.

1484 Assessing the Relationship Between ICT Integration How does the integration of tasks affect academic achievement?

Online assignment systems give students autonomy to do their work independently while offering real-time evaluation results. Academic achievement differs based on student participation in online tasks because students benefit from feedback timeliness and organized task structure.

What is the relationship between the integration of videoconferencing and students' academic performance?

The use of videoconferencing software remains indispensable for allowing both remote and synchronized educational activities. Academic performance gaps exist between students who engage in videoconferencing versus those who do not because videoconferencing enables direct instructor-student and student-student interactions and boosts learning comprehension.

This research examined two main objectives: first, it investigated the connection between ICT integration with student academic results at the University of the Andes in Andahuaylas and second, it evaluated the three key ICT tools of forums, tasks, and videoconferencing. This study evaluates how specific learning tools including forums, tasks and videoconferencing measure academic results of students. The research proposes recommendations backed by evidence to establish how ICT tools should be implemented throughout university education to elevate student academic success rates. A quantitative approach based on correlational research design enables the study to reach its goals. A survey research design using 140 student participants will collect data from students about their ICT utilization patterns along with their course grade outcomes. Statistical evaluation of the study data includes descriptive statistics which help explore ICT and academic results relationships side-by-side with correlational analysis techniques.

Materials and Methods

Research Design

The main research design utilized a quantitative method that studied correlations between variables. Academic performance of students at a university in Andahuaylas during the year 2023 represented the main area of research to explore how ICT tools (forums, tasks, videoconferencing) impact student learning outcomes. The study operated as a non-experimental approach because researchers did not modify variables, and the research took place without disturbing student behaviors in their environment. The research collected information through a one-time (2023) cross-sectional design.

Population and Sample

The target research participants included all students from the School of Education at Universidad Tecnológica de los Andes, Filial Andahuaylas during the 2023-I semester. Students representing all academic periods during the academic years 2023 attended the research at the School of Education under Universidad Tecnológica de los Andes, Filial Andahuaylas. Each student received an equal opportunity to participate in the study because probabilistic sampling determined methodically which participants would be chosen. A sample calculation was done for 221 students from various semesters applying 95% confidence level with 5% margin of error. The sample obtained of 140 participants proved adequate for delivering significant results with statistical meaning.

Instruments

The research data collection process involved using two specific tools which included an ICT integration questionnaire and performance assessment tests for evaluating academic results. The assessment tools created specifically for this research went through validation procedures which involved expert assessment.

ICT Integration Questionnaire

The ICT Integration Questionnaire functions to evaluate student utilization of multiple ICT tools when performing academic duties. Multiple-choice questions presented in the questionnaire used a Likert-like rating scale that included responses ranging from 1 (Never) to 5 (Always). The questionnaire divided its questions into three distinct sections. The forum questions comprised six statements that analyzed student perceptions on virtual forum participation in university debates. Students had to answer six questions about taking part in and accessing video classes appeared in the Videoconferencing segment (6 items). The ICT Integration Questionnaire maintained content validity after experts thoroughly validated it. The instrument achieved adequate reliability through Cronbach's Alpha calculation producing an alpha value of 0.838.

Performance Assessment Tool

The university supplied performance assessment tools for student evaluation that contained conceptual testing together with procedural assessment methods. The tool used by the university assessed student achievement by examining academic records with attention to subject grades.

For this study, the performance assessment tool focused on three key dimensions:

- **Conceptual performance**: Measured by the ability of students to understand and apply theories and concepts.
- **Procedural performance**: Evaluated based on the execution of tasks and application of learned procedures.
- **Attitudinal performance**: Focused on the students' participation and attitudes toward their learning.

Data Collection Procedure

The data collection procedure occurred throughout the 2023-I semester. Students who qualified for the research were approached to join and needed to finish an ICT Integration Questionnaire. Digital participants accessed the ICT Integration Questionnaire through a safe survey platform where unique identifiers prevented any identification of individual responses. The study retrieved performance data from academic records of participants through information obtained from the university's registrar office. Stemming from ethical guidelines, the study team processed all student-obtained data with strict confidentiality protocols.

Data Analysis

The researchers processed and analyzed their gathered data through SPSS version 27 for statistical analysis after finishing the data collection phase. Data processing through both descriptive analysis and inferential statistics examined the connection between ICT integration and academic results.

1486 Assessing the Relationship Between ICT Integration **Descriptive Statistics**

Analysis using descriptive statistics provided summaries about the distribution pattern of responses together with central tendencies and variability measures from both academic performance scores and ICT Integration Questionnaire results. The analysis focused on determining mean values as well as standard deviation along with skewness and kurtosis measures for every variable before performing a Shapiro-Wilk normality assessment.

Correlation Analysis

A Spearman's rank correlation coefficient analysis of ICT integration and academic performance served as the methodology. Scientists made the selection of this non-parametric test based on the non-normality found in their data sets. The analysis evaluated both the force and direction of influence that ICT tools (forums and tasks and videoconferencing) have on students' academic outcomes.

Influence Diagnostics

The evaluation of Cook's distance and leverage statistics helped detect data points that could weaken the study's conclusions by distorting the research results. The regression analysis results remained unaffected because all values fell below the determined threshold of 1. The Durbin-Watson statistics helped to determine if the regression model residuals showed autocorrelation. A value of 2.03 confirmed that residual dependence did not exist between the variables.

Ethical Considerations

All ethical procedures remained active from when data collection started to when analysis took place. Students joined the study at their discretion after receiving details about study goals together with privacy guarantees. Every participant granted their approval to participate before they answered the questions in the survey. Both the institution's Ethics Review Board and the students provided approval for the research to proceed.

Limitations of the Study

Several important limitations appeared in the research because it conducted its investigations within a single institution which hinders results from being universally applied to other academic establishments. A single-time snapshot through cross-sectional design hinders researchers from making cause-and-effect relationships because it only captures student performance and ICT usage at one point in time. The reliability of ICT usage information might decrease when students report their ICT activities because they tend to report higher levels than actual usage.

Results

The results of this study provide comprehensive insights into the relationship between the integration of Information and Communication Technologies (ICT) and the academic performance of students at the University of the Andes in Andahuaylas, 2023. Let's break down and interpret the findings from the key tables provided.

Descriptive Statistics for ICT Integration Dimensions

Students intensively use forums because the mean score reached 4.13 while the standard deviation equaled 0.69. Analysis of Table 1 reveals that more students tend to interact with forums deeply but there exist some students who engage with forums to a lesser extent based on a negative skew of -0.98. The kurtosis value indicates normal distribution since no outliers exist

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in this dataset. Data analysis using the Shapiro-Wilk test revealed with 0.000** p-value that regular forum use follows a distribution pattern different from normality. The standard academic practice indicates high integration of tasks because students complete 4.23 tasks on average while showing a standard deviation of 0.66. A skew of -1.11 indicates strong negative skewness which confirms most students handle tasks at high levels but show variability with their lower engagement levels. The calculation of kurtosis at 1.15 indicates a distribution shape with higher occurrences between low and high levels of student participation. Results showing a significant deviation from normal distribution appear once more through the Shapiro-Wilk p-value of 0.000**. Students integrate videoconferencing at a mean level of 3.94 with a standard deviation of 0.82 yet their performance stands slightly below the scores for both forums and tasks. Participation levels for videoconferencing fall in between low and high integration points with higher variability. The -0.30 skewness value shows an even distribution but students use videoconferencing more frequently. The kurtosis value of -1.04 shows the distribution has fewer extraordinary values while the Shapiro-Wilk p-value of 0.000** indicates substantial deviations from normality just like the other two dimensions.

Dimension	Mean	Standard	Skewness	Kurtosis	Shapiro-Wilk
		Deviation (SD)			(p-value)
Forums	4.13	0.69	-0.98	0.57	0.000**
Tasks	4.23	0.66	-1.11	1.15	0.000**
Videoconferencing	3.94	0.82	-0.30	-1.04	0.000**

 Table 1: The Descriptive Statistics for the Three Dimensions of ICT Integration: Forums, Tasks, and Videoconferencing.

Descriptive Statistics for Academic Performance

The researchers computed descriptive statistics for academic performance which incorporated the three dimensions of conceptual, procedural and attitudinal content (Table 2) while conducting normality tests. Student understanding of concepts reveals a moderately high performance level through scores with mean value 3.43 and standard deviation 0.84. Negative skewness value -0.35 shows a mild trend of students receiving better grades thus creating an even distribution. A flat data distribution emerges from the kurtosis value of -1.24 and the Shapiro-Wilk test p-value reached 0.000** level thereby proving a significant non-normal data pattern. Studens achieve higher results in procedural content tasks according to the reported mean score of 4.02 and standard deviation of 0.76. The distribution demonstrates moderate variability together with a flattened shape according to its -0.27 skewness parameter and -0.79 kurtosis value. The Shapiro-Wilk test p-value of 0.000** reveals substantial non-normal distribution after data evaluation. Student attitudes towards learning were measured at 4.01 points with a standard deviation of 0.75 points which indicates similarly high levels of positive feeling about learning. The distribution in this dimension shows slight flattening because skewness is -0.27 and kurtosis is -0.91 while the p-value of 0.000** confirms significant differences from normality.

Dimension	Mean	Standard Deviation (SD)	Skewness	Kurtosis	Shapiro-Wilk (p-value)
Conceptual content	3.43	0.84	-0.35	-1.24	0.000**

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Due e e dunel	4.02	0.76	0.07	0.70	0.000**
Procedural	4.02	0.76	-0.27	-0.79	0.000
content					
Attitudinal	4.01	0.75	-0.27	-0.91	0.000**
content					

Table 2: The Descriptive Statistics for Academic Performance Across Its Three Dimensions

Correlations Between ICT Integration and Academic Performance

The research analyzed the connection between ICT integration and academic results through Spearman's Rank correlation measures. Very strong positive connections exist between ICT integration and academic performance because the overall correlation coefficient of 0.895** indicates this clear evidence. Better academic results directly correlate to higher levels of ICT tool integration because of forum usage together with tasks and videoconferencing (Table 3). Academic performance demonstrates a very strong positive relationship with forum participation according to a correlation coefficient of 0.793**. The extent of active online forum involvement demonstrates notable improvement in students' educational results. The positive link between tasks completed and academic performance demonstrates a moderate strength with a value of 0.749**. Academically successful students complete tasks with better consistency but less strongly than when using online forums. The research shows that the 0.774** correlation between videoconferencing engagement and academic performance indicates a moderate strength with a value of positive link between students who take active part in videoconferencing sessions and their academic success.

Variable 1	Variable 2	Spearman's	Sig. (p-	Interpretation
		Rho (r)	value)	
ICT Integration	Academic	0.895**	0.000	Strong positive
_	performance			correlation
Forums	Academic	0.793**	0.000	Strong positive
	performance			correlation
Tasks	Academic	0.749**	0.000	Moderate positive
	performance			correlation
Videoconferencing	Academic	0.774**	0.000	Moderate positive
	performance			correlation

 Table 3: Spearman's Rank Correlation Coefficients for Relationships Between ICT Integration and Academic Performance

Regression Analysis (Multivariate)

All three aspects of ICT integration represented by forums and tasks and videoconferencing demonstrated positive significant effects on academic performance according to the multiple linear regression analysis. Academic performance received a significant increase of 0.238 units whenever students engaged in forum participation according to findings (p < 0.000). The data showed that increased task completion resulted in better academic outcomes and this relationship had a coefficient of 0.201 (p < 0.000). Academic research indicates videoconferencing had the smallest impact among the ICT dimensions since it produced a coefficient value of 0.195 (p < 0.000). The study data shows ICT integration supports academic achievements through different levels of influence on each measure. The Variance Inflation Factor (VIF) analysis of all predictors established a critical threshold of 10 which was not exceeded thus showing no **Lournal of Posthumanism**

meaningful multicollinearity effects on academic performance due to independent explanations from ICT dimensions.

Predictor	B	Standardized β	t-value	p-value	VIF
Constant	1.732	-	4.435	0.000	-
Forums	0.238	0.302	5.763	0.000	1.65
Tasks	0.201	0.258	4.964	0.000	1.56
Videoconferencing	0.195	0.255	4.582	0.000	1.43

Table 4: Multiple Linear Regression Predicting Academic Performance

Robustness Checks: Bootstrapping

The reliability and stability of the regression model were tested through bootstrapping procedures using 1000 resamples. Bootstrapping showed that the regression coefficient confidence intervals for forums between 0.21 to 0.28 excluded zero which provides firm evidence that observed academic performance relations with ICT integration arose from authentic causes rather than sampling error. The original model coefficients matched closely with those obtained during bootstrapping tests which reinforced the stability of the associated model. The results yielded reliable and consistent findings through this analysis which demonstrate that the obtained results would apply to additional sample groups.

Predictor	95% Bootstrap confidence interval	Mean B (from bootstraps)	Bias-Corrected and accelerated (BCa)
Constant	[1.12, 2.34]	1.73	1.70
Forums	[0.21, 0.28]	0.24	0.25
Tasks	[0.16, 0.22]	0.20	0.20
Videoconferencing	[0.18, 0.22]	0.20	0.20

Table 5: Bootstrap Confidence Intervals for Regression Coefficients

Advanced Multivariate Diagnostics

Diagnostic tests validated both the reliability and validity of the developed regression model. The model used Cook's Distance and Leverage statistics to detect potential extreme points that could affect the analysis results. The tests detected no outliers that might have caused substantial change to the model's calculation results. The reliability of the regression outcomes gets strengthened from this validation check. The regression model displays an independent pattern of residuals because the Durbin-Watson statistic calculated a value of 2.03. The lack of pattern between consecutive residuals validates the correct fulfillment of residual independence assumptions. The diagnostic tests verify that model conclusions remain unbiased despite the effects of outliers as well as influential points or autocorrelation issues.

Diagnostic test	Value	Interpretation				
Cook's distance	< 1 for all	No influential data points that unduly affect the regression				
	points	model.				
Leverage	< 1 for all	No data points with high leverage; they don't				
	points	disproportionately influence the model.				

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Durbin-Watson	2.03	Residuals are independent; no autocorrelation, confirming
statistic		the independence assumption is met.

Table 5: Advanced Multivariate Diagnostics for Regression Model

Sensitivity Analysis

Research assessed the impact of excluding each ICT component (forums and tasks and videoconferencing) on model explanatory power through the R^2 value. The analysis showed that exclusive removal of forums from the study caused the most substantial reduction in R^2 leading to the conclusion that forum involvement proves most influential for explaining academic results. Student achievement success depends heavily on forums because they operate as essential ICT tools. According to the research findings, forums play the most substantial role among all three ICT dimensions for improving academic results.

Variable Omitted	R ² (without variable)	Change in R ²
Forums	0.592	-0.084
Tasks	0.634	-0.042
Videoconferencing	0.642	-0.034

Table 6: The Sensitivity Analysis of Each ICT Dimension on the Model's Overall Explanatory Power (R^2)

Discussion

Research outcomes at the University of the Andes in Andahuaylas, Peru during 2023 offer important knowledge about the connection between Information and Communication Technologies (ICT) integration and academic performance of university students. This part examines the research results while comparing them to existing studies before discussing future educational practice implications. Academic performance and ICT integration through forums, tasks and videoconferencing show a strong positive relationship according to the results with an overall 0.895** correlation coefficient. Students who actively use ICT tools for their activities tend to achieve better academic results based on these findings (Fan et al., 2025). Academic performance demonstrates its highest correlation with forums while tasks and videoconferencing come in second and third order (Yoon and Leem, 2021). The investigation proves past research which demonstrated that ICT tools improve student academic performance (Shahzad et al., 2025). According to Al-Fraihat et al. (2020) ICT tools which include online forums and tasks create positive impacts on student engagement that result in improved academic outcomes. The educational tool combination of online discussions and task management platforms according to Cummings and Baldauf (2017) helps students strengthen their comprehension through organization which leads to better course retention. The research findings about forums and tasks within academic work validate existing knowledge about how ICT usage leads to academic achievements (Ben et al., 2022; Lei et al., 2021). Among all ICT dimensions forum participation demonstrated the most substantial positive association (0.238) with academic achievement according to the regression results. Critical thinking development and deep learning occurs through online forum participation according to Garrison, Anderson, and Archer's (2001) Community of Inquiry framework. Student performance benefited from regular forum involvement because they developed more meaningful peer and instructor exchanges regarding their coursework. The literature demonstrates that online forums create opportunities for collaborative learning which provides students with chances to exchange knowledge and to ask Journal of Posthumanism

questions as well as to offer mutual support for their academic growth (Garrison and Cleveland-Innes, 2005). Research by Morrison (2003) supports the finding that forum discussions in virtual classrooms increase social learning and mental presence thus leading to better academic results. Academic performance received a positive impact when students engaged in their assigned tasks at a rate of 0.201. Academic results from students strongly link to digital-platform tasks including quizzes and assignments. According to Wang and Chen (2019) online learning assignments that require evaluation with feedback strengthen student understanding and knowledge utilization which improves their academic grades. Students benefit from immediate feedback delivered through tasks which lets them uncover their weak areas and reorganize their study approaches (Hattie and Timperley, 2007). The students who regularly finished their tasks in this study probably received valuable feedback which enhanced their learning achievements. The positive impact of tasks on academic performance validated in this research study supports findings from Paechter and Maier (2010) who established that online task completion enhances student self-regulation and motivation which leads to academic achievement. This research confirms the necessity of implementing online tools to properly structure student assignments and quickly deliver feedback because these elements boost both attendance and academic achievements (Daniel et al., 2024). The positive relationship between videoconferencing and academic results (coefficient = 0.195) proved weaker than forum and task participation. The research of Bawa (2016) confirms that students gain real-time instructor-peer communication through videoconferencing, but the learning effectiveness depends on the quality of interactions. Martin et al. (2017) confirmed videoconferencing acts as an engagement tool, but videoconference success requires users to combine this technology with discussion forums and task management systems for meaningful learning results. This study reveals videoconferencing produces moderate effects which suggest the tool delivers less direct academic benefits compared to the other two ICT tools (Camilleri and Camilleri, 2022). Bootstrapping analysis confirmed that the findings about the linkage of ICT integration to academic performance exhibited stability and neither depended on test subjects nor their distributions (Tennakoon, 2024). Statistical evidence demonstrates that observed results are not random sampling effects because the regression coefficients' confidence intervals remain narrow (forums [0.21, 0.28]) (Götz et al., 2021). This reinforces the dependability of the research outcomes. The generalizable nature of the research results is confirmed by this finding because it shows that ICT tools produce positive academic performance effects across multiple analyzed population groups. The multivariate assessment showed no outlier points influenced the regression model and Durbin-Watson tests proved the absence of autocorrelation in residual data which enhanced the model's reliability (Ashoor et al., 2021). It is essential to focus on a model's robustness since this ensures we obtain accurate findings from the data. The model's R^2 value experienced its highest reduction when forums were excluded which affirmed forums as the prime ICT tool that influences academic performance. Garrison and Anderson (2003) confirm this discovery after emphasizing that learning environments based on discussions and collaboration lead to better academic results. The findings show that forums strongly influence student academic outcomes because they enable students to grasp materials and conduct question-based inquiries and advanced thinking about their education (Leasa et al., 2023; Putri and Utaminingsih, 2024; Liu et al., 2023). Several previous studies demonstrate that ICT integration creates positive academic performance outcomes which this research study confirms (Rind et al., 2022; Yılmaz, 2021). Academic performance improvement results from ICT tool utilization including forums and tasks according to findings of Al-Fraihat et al. (2020) and Wang and Chen (2019) and Paechter and Maier (2010). The results indicate that well-integrated ICT tools become powerful academic

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achievement instruments which benefit students by improving their concepts while enabling them to finish their tasks better. According to Martin et al. (2017) videoconferencing generated better results than forums and tasks did but this study established the opposite relationship. The University of the Andes online courses might not focus heavily on videoconferencing synchronous learning thus creating this difference with their academic framework.

Implications of the Study

College students from Andahuaylas demonstrated better academic results when their education incorporated Information and Communication Technology tools that included forums and tasks and videoconferencing. Students exhibit better academic performance when university curriculum includes these educational tools which students should learn how to use effectively. The most effective approach for enhancing academic performance consists of improving student involvement with forums and tasks in future educational plans. Educational institutions should utilize videoconferencing with caution to combine it properly with additional Information and Communication Technologies to achieve maximum results for student performance enhancement.

Conclusion

The evaluation showed academic improvement occurred among students who actively worked with ICT tools including forums and tasks and videoconferencing. Students received maximum academic benefit from forum participation while task completion and videoconferencing proved second and third for positive effects. Higher education must adopt ICT because research confirms the system creates environments where students become more engaged and receive prompt feedback and interact at higher levels. Research evidence supports the positive findings connecting ICT integration to improved academic results because information and communication technology tools help students develop both group learning and critical thinking skills and self-governance abilities. The study verified its reliable and stable results utilizing bootstrapping and multivariate diagnostic testing techniques which confirmed the robustness of the obtained findings. The sensitivity analysis revealed significant effects of forums on student academic performance so educators and administrators should direct special attention to developing active online discussion participation. The study presents critical information that affects educational institutions throughout Peru and other institutions engaged in digital learning expansions. ICT adoption brings the most rewards to universities which focus on incorporating digital tools across the curriculum and train their faculty and allocate funds for technological improvements. These institutions make it possible for students to develop required digital capabilities needed to succeed in the modern digital world of learning and work. Researchers need to investigate both short and long-term impacts of Information and Communication Technology implementations on academic results and identify what ICT platforms work best to boost student achievement outcomes.

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