



Virtual learning environments, academic performance, and student satisfaction: Quantitative evidence from anthropology undergraduates at a Peruvian public university

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ABSTRACT

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Using a quantitative methodology and a stratified random sampling method, data were obtained from 82 undergraduate Anthropology students at the National University of Altiplano (UNA) through an online questionnaire. This study explored the relationship between Virtual Learning Environments (VLEs) and academic achievement. Student survey responses were analyzed for statistical significance to identify relationships among variables such as student satisfaction, quality of course material, perception of VLE experience enriching learning, teacher interaction with learners, and university support. Spearman's rank correlation coefficient and a Likelihood Ratio Test were used to determine the relationship between survey responses and academic performance. The study found a positive relationship between student satisfaction with their learning experience, quality of course material, and the perceived effect of VLE experience on academic performance. No statistical significance was observed between teacher interaction with students and university tech support. Additionally, the absence of hands-on experiences, which are essential elements of learning in Anthropology, impeded academic success in virtual learning environments. Faculty should develop and provide students with instructional materials that are clear, relevant, and engaging for both faculty members and students. They should also utilize learner-centered teaching strategies, such as developing instructional materials to meet students' needs and promoting higher engagement and participation. Emphasizing pedagogical strategies to enhance the quality of virtual education is crucial, especially for students enrolled in institutions with limited or no digital access.

Contribution/Originality: The study offers new quantitative evidence on how satisfaction with online platforms, the quality of educational content, and the learning experience affect academic performance among Anthropology students at a public university in Peru. Its findings provide useful insights to enhance virtual education in areas facing technological gaps and limited digital access.

1. INTRODUCTION

The introduction of VLEs has transformed the way education is delivered and expanded the availability of information and options for learning & teaching. VLE adoption has occurred across many different colleges worldwide to adapt to the effects of globalization and advances in technology, particularly following the COVID-19 pandemic. However, implementing these environments has faced challenges such as inequality in access to technology, lack of teacher training, and the adaptation of academic content to digital platforms. Various international studies suggest that, although VLEs can improve autonomous learning and accessibility, their effectiveness depends on multiple factors such as technological infrastructure and adequate pedagogical training (Chong & Marcillo, 2020).

Distance education or virtual education has been implemented in different countries around the world long before the pandemic. However, at present, its analysis in terms of use has represented a fundamental concern regarding the methodological and instrumental differences and mastery of virtual environments of both teachers and students that can be evaluated in the academic performance and acquisition of skills in the training of new professionals in university higher education institutions (Barra-Quispe et al., 2024). There are several international studies on methods, strategies, competencies, ways of learning, and their impact on the academic learning process; however, in Peru, there is a gap in this knowledge, especially in relation to explaining the learning differences with respect to other first-world countries and the dropout rates and dissatisfaction with virtual teaching. Starting from the premise that education should be the same in all contexts, it raises the question of whether there are methodological factors or trends that directly affect the academic performance of university students. Studies in Malaysia and Spain demonstrated positive results in the use of the convergent learning style of virtual education and its impact on the learning progress of students; however, in South America, examples include cases from Antofagasta - Chile, Huancayo - Peru, Arequipa - Peru, Lima - Peru, and Chicla - Peru, where studies demonstrated an average learning style in relation to traditional environments, attributed to dispositional and motivational factors, with low levels of metacognition, self-knowledge, self-regulation, and evaluation. This indicates that Peruvian universities cannot fully comply with the quality policy focused on the learning process and that it requires innovation of traditional classes to improve the balance between knowledge, skills, and attitudes, allowing the incorporation of interdisciplinary methodologies for both teachers and students. It is maintained that in this process, the student is influenced by the teacher (Mamani-Flores, Apaza-Ticona, Calatayud-Mendoza, Vilca-Apaza, & Villanueva-Alvaro, 2025).

The pandemic accelerated the adoption of virtual platforms in the Peruvian education system as an alternative to keep classes active, a measure that transcended the health emergency. Several digital transitions also present serious imbalances within the educational system. For instance, although most students in urban areas could participate in remote education, only 40% of rural area students had adequate Internet access (MINEDU, 2022). Another significant issue faced by education is that many teachers received inadequate or no training for using the technology involved in remote teaching, resulting in further barriers to modernizing education. Universities did not escape these challenges either, especially in careers such as Anthropology, where face-to-face and fieldwork were always essential. Now the great dilemma is how to transfer this practical experience to the virtual world without compromising the training quality of future professionals.

Currently, virtual education has emerged as an important tool in the educational field, especially in response to the challenges posed by the COVID-19 pandemic. However, although it has been widely adopted in various disciplines, this context is still unknown in the professional school of anthropology, and how it influences the learning process in students. Thus, the need arises to analyze this incident in this specific context. The factors to be considered are the change in the educational paradigm, as mentioned (Severin, 2017), since the transition to virtual education represents a significant restructuring of the traditional educational paradigm. For this reason, the question arises about how this restructuring affects the way in which anthropology students achieve knowledge and develop skills in their discipline. Another factor is access to technological virtual resources, as mentioned (García-Gil, Fajardo-Bullón, & Felipe-Castaño, 2022), who consider the availability and access to adequate technological resources, since

these can vary among anthropology students at UNA Puno. It is important to understand how these differences can influence their participation and performance in virtual learning environments. It is also necessary to consider the dynamics of interaction and participation. Pérez, María, and Telleria (2012) affirm that virtual education can influence the dynamics and interaction between teachers and students, as well as among students themselves. It is essential to explore how these dynamics generate an impact on the academic learning process in the field of anthropology. Finally, the effectiveness of teaching strategies is another factor. Rosas and Jiménez (2009) provide us with this, which is to evaluate the effectiveness of the teaching strategies used in virtual education for students of higher university institutions.

As a result of the establishment of virtual platforms due to educational modernization and the necessity of adapting to present-day technology, the National University of the Altiplano Puno is experiencing challenges with its traditional training model for anthropology students. Traditionally, students are expected to gain practical training through hands-on experience in the field, interacting with local communities and learning from their culture. However, the practical training aspect of anthropology requires a different pedagogical model than is currently offered through digital platforms. The institution will need to develop a strategy to continue providing students with quality training, as well as methods to overcome challenges students face with access to technology, lack of familiarity with virtual learning environments (VLEs), and limited opportunities for social interactions.

2. LITERATURE REVIEW

2.1. Student Satisfaction with VLE

Student satisfaction is a critical measure of the satisfaction and overall effectiveness of an online education environment. The learner's experience with an online learning environment depends on various interconnected factors, such as the ease of use or intuitiveness of online learning platforms, the learner's assessment of the learning materials available on these platforms, and the effectiveness of the technical support provided by the platform developer. Castellanos and Castro (2018) found that students using well-designed and accessible online learning platforms are more satisfied and, therefore, more actively engaged in education than students using less accessible and poorly designed platforms.

In addition to the technical aspects, analyzing how digital tools serve to enhance the ways in which teachers and learners interact will provide the basis for the development of practical skills that inherently belong to their respective disciplines. Incorporating online platforms into anthropology training has many challenges, especially with regard to the study of communities where immersion and observation are essential components (as noted by Hofstede, Hofstede, & Minkov, 2011). Many problems arise when using these methods without direct contact with the communities under study. However, at the same time, these alternative environments offer exciting opportunities for the use of digital resources in different cultural environments while providing learners with immediate access to academic resources, thus amplifying the theoretical dimension of their training and enhancing their satisfaction with their studies.

In this instance, Constructivism describes how one can learn in a Virtual Learning Environment. Vygotsky defined learning through active interaction in one's sociocultural educational environment. Because Vygotsky (1978) viewed learning in this manner, he concluded that individuals had the greatest enjoyment in the learning process when they were learning by working together. When we consider digital learning platforms, we see that these platforms create nurturing opportunities for individuals to create knowledge through collaboration at a distance; through providing various types of resources for an individual learner's abilities and the ability to learn at the optimal rate/need for the individual learner. By providing students with the opportunity to learn, each student will gain increased motivation to develop knowledge through creation.

García (2019) explained how the cognitive load theory has significant implications for designing virtual training environments. According to García, a virtual training environment is designed to activate and create cognitive

resources to maximize the effectiveness of the training experience, not to create a cognitive burden for the learner by providing too much information or too many activities at once. The practical implications of the design criteria include user interface designs that provide easy access to a simplified environment, provide properly organized collections of content, and communicate information to learners in a clear and systematic manner; the inherent purpose of technology is to assist learners in assimilating and retaining a learning experience, not to impede their efforts to do so.

2.2. Contemporary Educational Anthropology

This interdisciplinary field analyzes educational systems and dynamics from a complex perspective, considering sociocultural contexts. Starting from constructivism, as mentioned (Sarastegui, 2004), which highlights that students are not only passive recipients but also actively build their knowledge by integrating their experiences into the sociocultural environment during meaningful learning. It is emphasized that education will gain relevance as long as it is linked to students' real lives, utilizing their cultural baggage. García and Pulido (1992) consider the need to adapt pedagogical methodologies to the diversity of students in the classroom, promoting interculturality where differences are valued as enriching learning elements. Amador (2017) criticizes hierarchical structures within educational processes; he proposes decolonization of knowledge as a critical process to question discourses of domination and to recover traditionally excluded knowledge. Lastly, Vera (2019) points out that technology has redesigned teaching by introducing collaborative tools and providing access to a globalized context with free knowledge.

Technology can deepen educational gaps, since not all students have the same opportunities to access or manage the digital tools they use. Rekalde and García (2015) propose the project-based learning method, where students develop practical skills when faced with real and objective problems. This encourages not only critical thinking and conflict resolution but also active collaboration, which is essential for adapting to current challenges. On the other hand, Gutiérrez (2013) highlights the importance of formative assessment as a continuous process that prioritizes ongoing feedback on students' progress. This approach ensures a deeper understanding of content. Authentic assessment is the primary evaluation of an individual based on how well they perform in daily life situations. The model also demonstrates that theoretical knowledge can be applied in meaningful and realistic environments for holistic learning.

2.3. Theoretical Trends in Learning

With the development of pedagogical theories, the approach towards understanding how we come to know things (how we learn), and how we optimize methods of learning for individuals has changed. Constructivism has been established as one of the new theories - Constructivism states that individuals learn through constructing their own ideas of their world. As they enter into interaction with their world and through the constant updating of their thoughts (mental schemas), they establish their understanding of their world (Piaget, 1970). In this view, experience, personal reflection, and group work are all important parts of developing one's cognitive abilities. The difference between Constructivism and Socio-Constructivism is that Vygotsky (1978) focused on the role of the social environment as an integral part of learning. In this view, students can develop their intellectual capabilities through interacting and collaborating with other individuals who have more experience than they do within the "Zone of Proximal Development" (where each student is within their own learning sphere). Both of these models of how we learn can inform the design and implementation of more flexible and responsive approaches to education that are sensitive to a wide range of diverse and changing circumstances.

2.4. Methodological Factors That Affect Learning

Understanding the optimal teaching methodology is essential to a student's ability to learn because it influences how teachers instruct students and how students learn. According to Hattie (2008), teachers who use student-

centered methods (such as group problem-solving and collaboration) markedly improve their students' academic performance. The design of a class affects a student's ability to learn, from the way the instructor arranges the subject matter and selects appropriate reference materials. According to Monge, Orozco Dávila, and Salguera Solano (2013), students will achieve retention of knowledge when their learning activities, such as formative assessment and regular feedback, stimulate their critical thinking and problem-solving skills. Cornejo and Rojo (2007) believe that, in order for learning to be truly beneficial, it needs to be immediate, clear, and able to link back to specific training objectives. Advances in technology continue to provide new opportunities for learning. Digital learning platforms continue to provide equal access to educational materials for all students, and through greater interaction and debate among students, there is increased opportunity for greater engagement in the educational process (Jaimes-Ojeda, 2017). Group discussions or collaborative projects strengthen knowledge retention because they allow students to engage in active learning (Lozano, Suescún, Vallejo, Mazo, & Correa, 2020); they consolidate knowledge through practice. Thus, a combination of participatory techniques, careful planning of sessions, well-designed formative assessments, and integrated, dynamic technological tools that require more active participation is essential to improve the educational experience in a meaningful way.

2.5. Change in the Educational Paradigm

The shift in the traditional education model was not only a change in methodology. The education industry has had to completely re-examine the way the teaching/learning process is currently conceptualized. According to Díaz (2008), this new approach offers a model that goes beyond simply passing information from one person to another and focuses on the complete development of an individual throughout their lifetime. The way we teach and learn today is based on a constructive philosophy. In addition to what Díaz has said, Stiefel (2010) indicates that the learner creates their own knowledge and understanding of the world, dispelling the notion that education is simply the process of receiving information without being an active participant. With the increase in the use of technology within the classroom, a major driving force of the changes in education has been the emergence of digital technology into the education process. Rodríguez (2014) has also stressed that, with the advancement of digital technology in education, we must evolve to new pedagogical paradigms that utilize this new technology to enhance our connection to learning and reality. As educators have become more aware of the diverse nature of our students, they are adjusting their educational practices to provide greater equity and better service to all learners. López and Santiago (2011) indicate that we must adapt our curricula to fit the needs of each student and their unique backgrounds and circumstances, rather than to their socioeconomic status or cultural background. The new pedagogical paradigm is focused on a set of teaching strategies that demonstrate increased levels of participation, are more adaptable, and are based on objective, contextualized settings. The end goal is to provide a method by which knowledge can be effectively put to use to impact the world around us in a more meaningful manner.

2.6. Access to Technology Resources

As we begin to address the issue of technology's impact on providing equal and fair opportunities for all students, Houses has recognized that to ensure that learners have access to the resources they need to successfully complete their training, "the access of learners to technology is absolutely necessary" (Casas-Huamanta, 2022). The increased importance of this need is illustrated by Belloch's (2013) assertion that the technological resource gap will cause even broader divides between low-socioeconomic and higher-socioeconomic student populations. This means that we, as educators, must engage in specific ways to address the gaps created by the disparity of technology available to students at various socioeconomic levels (Belloch, 2013). Grisales-Aguirre (2018) contends that providing just digital devices and internet access will not result in the realization of equitable education, but instead, educators and other stakeholders must develop their own digital literacy and that of their students in order to maximize the uses and benefits of digital tools and resources. To achieve equitable education, we need to move away from the simplistic

concept that technology access is merely a matter of having hardware and internet service and develop a holistic model that incorporates all digital resources available, as well as the knowledge and skills needed to effectively utilize these resources for teaching and learning purposes.

2.7. Dynamics of Interaction and Participation

The notion that the collaborative nature of learning enriches the educational experience has been articulated by Pereira (2010); in addition, Rosanigo, Bramati, López, Bramati, and Cotti (2016) have added to Pereira's work through their examination of socio-constructivism to highlight how effective collection is made possible when well-planned group tasks are undertaken in schools. With advancements in technology, such as the Internet, the possibility of learning together has transcended the classroom and is now created electronically. Pérez (2012) has presented these advances and their effect on a global scale. As a consequence of this reality, interaction becomes significantly more powerful when we are able to harness and utilize current technologies to create and interact within this virtual environment; this allows for the construction of a collective understanding that is mutually beneficial and creates a sense of belonging. The aspects of meaningful interaction also help to establish the meeting of basic human needs and develop the social skills that we need throughout our lives, which occur both in face-to-face and virtual spaces.

3. METHODOLOGY

The study occurred at the UNA (Professional School of Anthropology) located in Puno (Peru), which had a target population of students who were enrolled in semesters IV-VI. Of these, 167 undergraduate students were included in the study during the first academic period of 2024, as shown in Table 1.

Table 1. Distribution of students enrolled until the 2024-I semester.

Semester	S-4	S-5	S-6	S-7	S-8	S-9	Total
Number of students enrolled in the 2024 academic period	56	42	18	10	22	19	167

Note: The source of verification is the EPA's Office of Academic Records.

Using probabilistic sampling from a representative sample of 82 students (stratified by academic semester), the sample size was calculated to be 82. A finite population formula with a 95% confidence level and a 5% margin of error was applied.

An online questionnaire was developed for this study to gather information about how students perceive and evaluate their experiences in the Virtual Learning Environment (VLE). The questionnaire had a pre-defined series of multiple-choice and five-point Likert scale questions, which included questions about perceived usability and usefulness of the VLE, perceived interaction with other students while in the VLE, and students' access to technological resources, digital skills, and their perceived contribution to the overall learning process. Structural barriers for students in using VLEs were assessed through a range of questions, including technology availability, internet connectivity, and access to digital devices.

For inferential statistical analysis, the following hypotheses were developed: (H_0) There is no relationship between the VLEs and the education process of anthropology students; and, (H_1) There is a positive relationship between these variables. The results of preliminary analyses using the Kolmogorov-Smirnov test indicated that the data did not meet normality assumptions. Therefore, the Spearman Rho correlation was used to evaluate the bivariate relationships between the two main variables.

The influence of various uncertain predictors (digital resources, digital competence, and participation in virtual environments) was evaluated through the application of a multiple regression linear model. Non-normal distribution impeded consideration of explanatory models; therefore, it was utilized for explanatory purposes, as the use of standardized coefficients allowed for robust comparisons despite only moderate deviation from normal distribution.

This enabled strong testing of the association and relative contribution of each factor to academic achievement in virtual learning environments.

4. RESULTS

4.1. Satisfaction with the Virtual Learning Environment Among Anthropology Students

To establish the correlation between satisfaction with virtual environments during the educational process and the academic performance of EPA students, the Kolmogorov-Smirnov normality test was applied. The results revealed that, at a significance level of $\alpha = 0.05$ or a 95% confidence level, the data from the student survey do not follow a normal distribution, with a P-value less than 0.05 in all cases analyzed, indicating that the data distribution is significantly different from a normal one. Due to this violation of normality, it was decided to use a non-parametric test, specifically Spearman's Rho correlation coefficient, which is suitable for categorical variables.

This method made it possible to assess the level of dependence between several independent variables: simplicity in the interaction between teachers and students, complacency with the use of digital platforms, the excellence of educational materials, the learning experience, the technical support provided by the university, and the perception of whether virtual environments are appropriate for the Anthropology career. These variables showed a correlation with the increase in the students' academic performance (dependent variable). Previous studies have proposed that effective interaction between teachers and students, coupled with satisfaction with technological resources, is a crucial factor in academic success in virtual environments (Bautista, Monge, Obregón, & Moyano, 2024). Additionally, it has been determined that appropriate technical support and the excellence of educational materials positively influence students' learning experiences (Velásquez-Humppire & Guerra-de González, 2024).

Table 2 shows the findings of the correlation between the variables that facilitate interaction with teachers and students through virtual environments and the improvement in students' academic performance. The study of the information reveals that the P-acquired value is $p = 0.680$, which exceeds the significance level of $\alpha = 0.05$, leading to discarding the alternative hypothesis (H1) and accepting the null hypothesis (H0). This implies that no significant correlation has been identified between academic performance and the ease of interaction between teachers and students through virtual environments within the context of the LFS.

Table 2. Virtual teacher–student interaction and academic performance.

Spearman's Rho		How easy is it for you to interact with teachers and classmates through virtual environments?	Do you think that eLearning as a tool for learning has improved your academic performance?
How easy is it for you to interact with teachers and classmates through virtual environments?	Correlation coefficient	1.000	-0.046
	Sig. (bilateral)		0.680
	N	82	82
Do you think that eLearning as a tool for learning has improved your academic performance?	Correlation coefficient	-0.046	1.000
	Sig. (bilateral)	0.680	
	N	82	82

Table 3 shows the findings of the correlation between satisfaction with the use of digital platforms and the increase in the academic performance of EPA students. The study reveals that the acquired P-value is $p = 0.023$, which is lower than the significance level of $\alpha = 0.05$, leading to discarding the null hypothesis (H0) and accepting the alternative hypothesis (H1). This indicates a significant relationship between academic performance and satisfaction with the use of digital platforms. With 95% certainty, we can argue that there is a positive, albeit limited,

relationship between satisfaction with these platforms and academic performance. In conclusion, the greater the satisfaction with digital platforms, the more the academic performance of students will improve, highlighting the relevance of user experience in the online learning process.

Table 3. Virtual platform satisfaction and academic performance.

Spearman's Rho		How satisfied are you with the use of virtual platforms (Zoom, Moodle, Google Classroom) in your learning process?	Do you think that eLearning as a tool for learning has improved your academic performance?
How satisfied are you with the use of virtual platforms (Zoom, Moodle, Google Classroom) in your learning process?	Correlation coefficient	1.000	0.250*
	Sig. (bilateral)		0.023
	N	82	82
Do you think that eLearning as a tool for learning has improved your academic performance?	Correlation coefficient	0.250*	1.000
	Sig. (bilateral)	0.023	
	N	82	82

Note: *. The correlation is significant at the 0.05 level (2 tails).

Table 4 presents the findings obtained by linking the quality variables of educational content in virtual environments with the academic performance of EPA students. The evaluation of the information shows that the value of P is $p = 0.000$, which is lower than the significance level of $\alpha = 0.05$, leading to discarding the null hypothesis (H_0) and accepting the alternative hypothesis (H_1). This suggests that there is a relevant correlation between the quality of educational materials and the academic performance of students in virtual environments. With 99% confidence, it can be argued that there is a positive, albeit minimal, correlation between the quality of content in these contexts and academic performance. In other words, the higher the quality of the educational resources provided on digital platforms, the greater the progress in students' academic performance.

Table 4. Virtual content quality and academic performance.

Spearman's Rho		How do you evaluate the quality of the educational content you receive through virtual environments?	Do you think that eLearning as a tool for learning has improved your academic performance?
How do you evaluate the quality of the educational content you receive through virtual environments?	Correlation coefficient	1.000	0.399**
	Sig. (bilateral)		0.000
	N	82	82
Do you think that eLearning as a tool for learning has improved your academic performance?	Correlation coefficient	0.399**	1.000
	Sig. (bilateral)	0.000	
	N	82	82

Note: **. The correlation is significant at the 0.01 level (2 tails).

Table 5 presents the findings of the correlation between students' perception of whether virtual environments provide a positive educational experience and their academic performance. After performing the analysis, it is determined that the P-value is $p = 0.000$, which is lower than the significance level $\alpha = 0.05$; therefore, the null hypothesis (H_0) is discarded, and the alternative hypothesis (H_1) is adopted. This finding indicates that there is a significant correlation between students' perception of the quality of the educational experience in virtual

environments and their academic performance. With 99% certainty, it can be said that the greater the perception that virtual environments provide an excellent teaching experience, the greater the progress in students' academic performance.

Table 5. Virtual learning experience and academic performance.

Spearman's Rho		Do you consider that virtual environments provide you with a good learning experience?	Do you think that eLearning as a tool for learning has improved your academic performance?
Do you consider that virtual environments provide you with a good learning experience?	Correlation coefficient	1.000	0.382**
	Sig. (bilateral)		0.000
	N	82	82
Do you think that eLearning as a tool for learning has improved your academic performance?	Correlation coefficient	0.382**	1.000
	Sig. (bilateral)	0.000	
	N	82	82

Note: **. The correlation is significant at the 0.01 level (2 tails).

Table 6 presents the findings of the correlation between students' satisfaction with the technical support provided by the university institution and their academic performance concerning the use of virtual environments. The study of the information shows that the P - acquired value is $p = 0.080$, which exceeds the significance limit $\alpha = 0.05$, therefore, the alternative hypothesis (H1) is discarded and the null hypothesis (H0) is adopted, which suggests that there is no relevant relationship between satisfaction with technical support and improvement in the academic performance of students in the LFS.

Table 6. Technical support satisfaction and academic performance.

Spearman's Rho		How satisfied are you with the technical support offered by the university in relation to the use of virtual environments?	Do you think that eLearning as a tool for learning has improved your academic performance?
How satisfied are you with the technical support offered by the university in relation to the use of virtual environments?	Correlation coefficient	1.000	0.195
	Sig. (bilateral)		0.080
	N	82	82
Do you think that eLearning as a tool for learning has improved your academic performance?	Correlation coefficient	0.195	1.000
	Sig. (bilateral)	0.080	
	N	82	82

Table 7 presents the findings obtained by linking the variables associated with the suggestion of virtual environments for teaching-learning in the discipline of Anthropology and their influence on the academic performance of students. The study shows that the value of P is $p = 0.001$, which is less than the significance limit $\alpha = 0.05$, leading to the rejection of the null hypothesis (H0) and acceptance of the alternative hypothesis (H1).

Table 7. Recommendation of virtual environments and academic performance.

Spearman's Rho		In general, would you recommend virtual learning environments for teaching in the Anthropology career?	Do you think that eLearning as a tool for learning has improved your academic performance?
In general, would you recommend virtual learning environments for teaching in the Anthropology career?	Correlation coefficient	1.000	0.369**
	Sig. (bilateral)		0.001
	N	82	82
Do you think that eLearning as a tool for learning has improved your academic performance?	Correlation coefficient	0.369**	1.000
	Sig. (bilateral)	0.001	
	N	82	82

Note: **. The correlation is significant at the 0.01 level (2 tails).

5. DISCUSSION

5.1. Student Satisfaction with the Virtual Environment

According to new research by Chica, Serna, and Pabón (2024), student satisfaction with digital tools and access to quality study materials were two of the biggest factors contributing to success in virtual learning environments. When student satisfaction with digital resources is paired with properly organized institutional support, such as remote degree programs offered through the Professional School of Anthropology, student performance greatly improves.

Other studies conducted in the past have shown a similar trend to those included in this current research, specifically, while digital communication is key for virtual education, its direct relationship/impact on student academic performance is less significant than initially believed (Kuz, 2022; Mercado, Guarnieri, & Luján, 2019). Another interesting finding was that, while the ease of communication with teachers (digital) had the opposite effect on student performance compared to what previous research has shown. Therefore, the inverse and/or very low correlation between the ease of digital communication and academic performance could be attributed to a number of factors, including the level of student engagement, as well as the teaching styles used to instruct students (Cristina & Pérez, 2024).

The structural aspects of virtual interactions play a significant role in determining the effectiveness of such courses, according to research by Contreras-Colmenares and Garcés-Díaz (2019). The authors argue that there are differential effects produced by these structural aspects of digital communication beyond what is measured via basic academic metrics. As a result, the connection between digital interaction and academic success is often difficult to establish, despite its significance.

The overall picture is complicated, as there is general agreement among experts that interaction is of great importance when engaging in virtual learning environments; however, how this will affect students' final performance depends on many factors other than simply measuring their level of interaction. Various aspects of instructional design, socio-educational contexts, and personal characteristics of students create an environment where digital communications can be useful and positively impact learning outcomes; they are not, however, sufficient on their own to determine whether or not a student will be successful academically.

What many educators suspected was confirmed by our research: when students feel comfortable with the virtual platforms they use, their motivation toward learning and their achievement dramatically increase. Pérez-Vascones, Morales-Sabando, and Bajaña-Zajia (2024) were able to illustrate this relationship; Hamburger (2019) showed that students who perceive digital tools as useful and easy to use tend to attend classes regularly and perform better academically. It appears that two factors work in concert—the design of the platforms and the experience a user has while using them to create the optimum conditions necessary for success in an online educational environment.

Our research highlights an important characteristic of the current educational landscape at the university level: the quality of digital educational resources used in online courses has a profound impact on how students experience their education. As described by Palomino-Fernandez, Cáceres-Reche, and Lara-Lara (2015), when digital resources are well-designed, current, and clearly organized, students will have an easier time comprehending the content being taught and will achieve higher grades. Henao and Zapata (2002) build upon this idea by demonstrating how the clarity and relevance of digital resources can serve to motivate students and enhance their performance. The evidence supports the need to invest in the improved pedagogical quality of digital resources.

The information presented in this research supports previous research conducted by Guijarro, Giner, Caravaca, Montilla, and Lana (2024), confirming that experiences derived through online learning tools lead to increased student engagement and achievement. In addition, previous research by Guerrero, Berdugo, and Rubio (2017) and Smith and Gonzáles (2024) found evidence identifying two primary factors that enhance student engagement and academic achievement using digital platforms: 1. Quality teaching interactions created in the online environment and 2. Students' satisfaction with their experience of using the platform. Therefore, developing both components together enables teachers to better improve student performance in online distance learning.

The findings of this study provide a clear indication that although many students use digital learning resources, support offered by various forms of technical support (i.e., Help Desk) does not appear to increase their level of success in an academic environment. This supports the conclusions reached by Rosanigo et al. (2016) in their study of online learners, and that although technical support is necessary for students to engage in online learning, the level of effectiveness of that support does not necessarily relate to increased levels of academic accomplishment for students. The authors concluded that the effectiveness of the quality of course materials and the communication between instructors and learners are far more critical factors in determining the success or failure of students in an online learning environment (Hamburger, 2019).

The correlation between how much students enjoy digital learning platforms and their academic performance at the Professional School of Anthropology is interesting; while not a strong correlation (the authors do not report a correlation coefficient), students who express an affinity for using an online platform usually see an incremental improvement in their academic results. While these findings are not new, their observation and documentation by researchers such as Mancha, Casa-Coila, Yana, Mamani, and Mamani (2022) and Rosanigo et al. (2016) continue to support the idea that students with a generally positive view of technology will achieve better results (Chica et al., 2024; Cristina & Pérez, 2024). The authors also indicate that, while they provide flexibility for the educational process, structured online environments can serve as significant support for students learning alongside traditional classroom instruction.

6. CONCLUSION

According to our analysis, Anthropology students who have a positive evaluation of their virtual platforms appear to perform better academically; however, this relationship is weak overall. The most influential factors are the quality of the educational resources, the enrichment of the learning experience, and the perception of these digital platforms as recommendable. For example, communication between instructors and students or the availability of technical support are not shown to relate directly to student performance. Instead, these elements are functioning as "basic requirements" for academic success. Based upon these results, we conclude that although well-designed digital tools and appropriate resources will aid the learning process, actual academic progress occurs within a more complex environment and results from the interaction between the student's motivation, the instructor's pedagogical design, and the use of technological tools. Therefore, we recommend placing greater emphasis on the enhancement of educational resources and training experiences, and less emphasis on simply expanding opportunities for student-instructor communication or technical support.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

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