Quality of Online Learning in Students of the Higher Level

José-Walter Coronel-Chugden[1*], Yersi Luis Huamán Romaní[2], Teresa-Juliana Jara-Alarcon[1], Aldo Alarcon-Sucasaca[2], Orlando Olivares-Rivera[3], Ruth-Nataly Aragón-Navarrete[2], Rusbita Reynaga-Chávez[3]

[1]National University of Frontera, Peru
[2]National Amazonian University of Madre de Dios, Peru
[3]José María Arguedas National University,Peru
Email: jcoronel@unf.edu.pe

Abstract

E-learning is essential for effective feedback, which motivates the implementation of university infrastructures. The objective is to analyze the level of quality of e-learning in higher level students. An online survey of 1901 students was conducted. Descriptive statistics and multiple linear regression technique were used. The results indicate overall an average score of 3.34 for learning quality and satisfaction level of 66%. The model is significant ($p<0.05$), but the factors sex, residential area, professional career and cycle are not significant. The findings suggest promoting management that integrates the various factors involved in the quality of e-learning.

Keywords: Online Learning; Quality of learning; Feedback; Academic performance; Information technology; Education.

1. Introduction

Quality is defined as the philosophy of achieving excellence in all aspects of education through e-Learning technologies. (Veeramanickam & Ramesh, 2022). In terms of Li & Chin-Chung (2023), quality in learning could be understood as a set of characteristics or attributes that are chosen to evaluate the service that affects consumer satisfaction, either implicitly or explicitly. Meanwhile, this does not depend largely on technology, but on student-instructor interaction.(Pham et al., 2019). For its part Astin (1993)Education providers can only attract and retain students online if they provide educational services that are perceived to reliably meet student requirements and add value to students. Since the ability to interact and the perception of the user's quality depend on the device used to access the service(Gulliver & Ghinea, 2006). However, online learning suffers from a lack of community, insufficient interactions between

students and faculty, and low student satisfaction compared to face-to-face learning. (Song et al., 2004).

The use of an online learning environment is indispensable to provide immediate and frequent feedback, however, the value of technological tools and courses combined in several academic disciplines are not consistent and only point to minimal effects on academic performance. (Förster et al., 2018). On the other hand, Duki & Stri (2015), notes that the lack of adequate information literacy skills, coupled with inadequate ICT infrastructure and equipment, significantly limits the efficient use of electronic resources by students. For its part, Van (2005), he adds, that, the concept of online learning involves the implementation of advanced technologies, including computers and the Internet, to deliver course content, engage learners, and facilitate two-way communication between students and teachers. In a context of competing demands for limited funding and rising student expectations, university services and programs often must demonstrate evidence of their effectiveness. (Montenegro et al., 2016). Most students believe that e-learning was a great complement to prevent academic failure, but cannot replicate the same effectiveness of face-to-face training. (Salahshouri et al., 2022) the same happens with teacher performance (Cuellar-Quispe et al., 2023).

The challenge of improving the quality of learning is fourth among the seventeen sustainable development goals (Pham et al., 2019), therefore, online learning is becoming a crucial part of the educational process worldwide, especially after the recent COVID-19 pandemic (Barakat et al., 2022), for this reason, universities are striving to introduce e-learning as a service to the learner, which involves a number of factors such as investments and others such as users' ability to use, and can have a positive or negative influence. (Ramayah et al., 2010). Other factors that influence for example, the low completion rate of online learning (Longhini et al., 2021), low effect of online learning, fragmentation of knowledge and information, lack of interaction and feedback of learning, etc. (Jenkins et al., 2021); therefore, student satisfaction and the assessment of the quality of e-learning in different countries are not promising; Therefore, higher education institutions should reconsider their efforts and approaches to improve them and thus obtain better learning outcomes. (Al-Smadi et al., 2022) as well as focusing on the environmental awareness that today needs to be promoted (Vilcapoma-Malpartida et al., 2023).

However, in terms of (Ahmady et al., 2018), the dropout rate for students in e-learning courses is 10% to 20% higher than that of traditional face-to-face courses. According to Hone & El Said (2016), the effectiveness of this service varies between 25% and 90%, in relation to the development of classes on campus. In the Peruvian context, according to figures from the National Household Survey (Enaho) of the National Institute of Statistics and Informatics-INEI (2020), 400 thousand students stopped taking classes during the year as a result of the pandemic; however, the policies of the Peruvian State were to develop virtual classes; situation that revealed many shortcomings in the academic and administrative field of Peruvian education, where educational institutions of basic level, as well as higher level, showed inefficiency for virtual teaching, given by multiple factors, including: shortage of internet service, teachers and administrators with little knowledge for the management of technological tools,

sociodemographic factors, socioeconomic levels and most importantly the level of digital competence that did not count at that time also influenced (Huamán-Romaní et al., 2023). According to another of his reports from the (INEI, 2019), shows that according to the 2018 classifier, a total of 7 768 higher education programmes have been registered between university, pedagogical, technological and technical productive, of which 1 734 are professional programmes, 5 212 postgraduate programmes of universities and 822 of higher technological and technical productive institutes. Taking as references the university entities of the 143 (51 public and 92 private universities) only 96 have a license (Supervisory Body for State Procurement - OSCE, 2023), of which according to a report by (Quacquarelli Symonds (QS), 2023), only ten managed to place in the 2024 ranking.

Within that framework, numerous indicators have been described in the literature to assess the quality of education provided by higher education institutions. Veeramanickam & Ramesh (2022), proposed six dimensions to assess the degree of flexibility and adaptability, the degree of compatibility, the qualification and experience of staff, the evaluation of performance and the interest of the student; based on this, they evaluated the prediction of the impact of the quality of e-Learning, through SEM analysis (Structural Equation Modeling), which allowed to identify the quality of learning in the e-Learning platform. Vasconcelos et al., (2020), applied the MPS-USE strategy in a university setting to assess the quality of an online course. The results showed that the service configuration composed of multi-criteria aligned with the interests of decision makers. Jung (2011) identified seven quality dimensions: Institutional Support, Course Development, Course Structure, Teaching and learning, Student support, Faculty support, Assessment and assessment. Uppal et al., (2018), extended the SERVQUAL model to assess e-learning quality by adding two factors learning content and course website. However, in universities specifically in northern Peru, there is still little information on the level of quality of electronic learning in higher level students, data that we consider relevant since it leads to achieving excellence in all aspects of education; In this context, this study is very relevant for its contribution to the scientific and administrative community for timely decision-making.

Thus, studying the quality of e-learning is essential for several reasons: it allows managers and administrators to take timely actions to improve quality and ensure learning objectives effectively, which in turn can have a positive impact on society at large. According to (Marold et al., 2022), asserts that doing studies on the subject in question, allows students to attend in a timely manner to the technological deficiencies that may arise at the time of feedback. (Tang, 2024). As well as, to check if it transcends the image of the educational institution (Serrano et al., 2023). For its part (Mojarad et al., 2023)Research has shown that students who are satisfied with e-learning tend to get better learning outcomes. (Battista et al., 2023), points out that in addition to the above, it allows to propose better e-learning methods for teaching. Other studies argue that it ensures that the 2030 Agenda for Sustainable Development is respected, including its focus on "equity". (Serrano et al., 2023). Specifically, in the Sustainable Development Goal (SDG) 4, emphasizes the importance of increasing access to inclusive, equitable and quality education, therefore the analysis of the data emitted by students can play an important role in fulfilling this end. (Carow et al., 2023). Indeed, an improvement in learning is key not only in

people's lives, but also in the Economic development of the country to increase productivity and reduce inequality (Sulis et al., 2020).

There are teaching and learning factors that lead to the development of academic performance, but there is also the level of satisfaction that the university student perceives and even more so if there is competition to be one of the best universities (Huamán-Romaní et al., 2023b). For this reason, the objective of this study is to identify the level of quality of e-learning in higher level students. And as a specific objective, to identify the sociodemographic factors that affect the quality of e-learning in higher level students.

2. Methodology

2.1. Population, sampling and sampling

The population consisted of 6700 students from two universities in northern Peru (public and private). Of the population, a representative sample, consisting of 1901 students, was estimated to be 99% confident and 2.5% error. The estimated sample was stratified, applying a probability sampling for a finite population. The estimated sample was subdivided by applying a stratified probability sampling by proportional affixation, whose formula was ni = (Ni / N) * n that allowed to determine the sub study groups.

2.2. Technique

To collect the information, the online survey technique was used. In terms of Alvira, (2011), the fundamental feature of online surveys consists in the use of the Internet for the sending of the information and the hosting of the data received on a server designed for this purpose. For our case, the form was self-administered through a personal email in which respondents sent their answers through the Internet.

2.3. Instrument

The electronic cross-sectional questionnaire developed in Google Forms was applied, which corresponds to the author Barakat et al., (2022), this instrument is organized into two sections; The first part evaluates the sociodemographic factors according to: university, type of university (state or private), gender, residential area, professional career, age, cycle of studies.

The second part collects information on the quality of e-learning in higher level students, the questionnaire consists of 14 items and for each item, respondents were asked to indicate to what extent they agree with the statement, using a five-point Likert-type response scale, ranging from strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5).

The instrument was structured according to detail: 1) E-learning helps me achieve my future plans (traveling, obtaining a higher degree, etc.). 2) Overall, my university offers a high-quality online learning experience. 3) I would prefer e-leaming to become the new normal. 4) I feel comfortable communicating with my professors and colleagues electronically. 5) I feel that

studying online courses will help me to McMorize and master them better. 6) Electronic courses help to organize study time and perform academic tasks better than face-to-face university education. 7) I have satisfactory computer skills to handle online courses/assignments. 8) I can ask questions and get answers from teachers quickly electronically. 9) I prefer face-to-face communication with my teachers and classmates because it is more effective. 10) I can easily work in groups on e-courses. 11) All my courses can be taken electronically without difficulties. 12) My university provides technical support for e-leaming. 13) E-leaming leads to educational overload in students. 14) E-learning helps generate better ideas than studying in the classroom.

The instrument described above, has high validity and reliability, that is, the survey, was evaluated by a team of 15 experts in educational technology and socio-behavioral sciences to evaluate the validity and content of the survey elements. In addition, to ensure clarity, readability and comprehensibility, the questionnaire was tested (in several languages) to a pilot group and necessary adjustments were made. The instrument was supplied online through the Google Forms platform; whose survey link was sent randomly and the 1901 (99% confidence, 2.5% error) required for study by university students from different academic schools of both universities were satisfactorily completed.

2.4. Data analysis

The data were obtained according to the described instrument and were processed with the statistical software Minitab v.19, Python v.3.10 and the Microsoft Excel 2019 spreadsheet and two types of statistical analysis were applied.

Descriptive statistics: A descriptive analysis was made using tables and figures (bars, Pareto charts, graph of errors or quality residuals) that describe the behavior and compare the variable and dimensions of study; as well as descriptive statistics such as: mean, median, maximum and minimum values, standard deviation, variance and coefficient of variation.

Inferential statistics: Correlation analysis was used to statistically test whether there is a significant correlation between study dimensions. In addition, the Pareto chart was used to describe the standardized and significant effect of the estimated multiple linear regression (RLM) model and a residual plot to examine goodness of fit in regression and ANOVA to assess differences in the quality of e-learning. Finally, the Chi-square test statistic was administered to evaluate and validate whether the multivariate model of structural equations is statistically significant.

3. Results

With the data obtained based on the questionnaire administered to the population according to the purpose of the study, the process and statistical analysis were carried out, finding the following:

University	UDEP	794	42%
	UNTRM	1107	58%
Guy	Private	794	42%
	Public	1107	58%
Gender	Female	1051	55%
	Male	850	45%
Area of residence	Rural	542	29%
	Urban	1359	71%
Career	Business Administration	239	13%
	Science and Engineering	718	38%
	Economics and accounting	129	7%
	Law and CCPP	120	6%
	Medical and Health Sciences	170	9%
	Environmental sciences	120	6%
	Educational sciences	140	7%
	Hospitality and tourism	80	4%
	Technical careers	70	4%
	Gastronomy	25	1%
	Other	90	5%
Age	18-27	1816	95.5%
	28-37	65	3.4%
	38-47	14	0.7%
	48-57	5	0.3%
	58-65	1	0.1%
Cycle of studies	1-3	1094	58%
	4-6	441	23%
	7-10	366	19%
	Total	1901	100%

Note. Survey applied to students.

In Figure 1, we can evaluate that of the 14 items that evaluate the quality of learning, it was ordered according to its average score of the 1901 surveys carried out, obtaining an average score between the range [1-5 points] being as expected score the best of 5 points for a very satisfactory

level. Thus, of the 14 items evaluated, the average learning quality score is 3.34 points. Likewise, it was clearly evident that item 9 is the best with an average score of 4.05 points, followed by item 2 with 3.77, until the last item 5 as the lowest with an average score of 2.86 points. Consequently, higher priority should be given to items that have a lower average score to improve the quality of student learning.

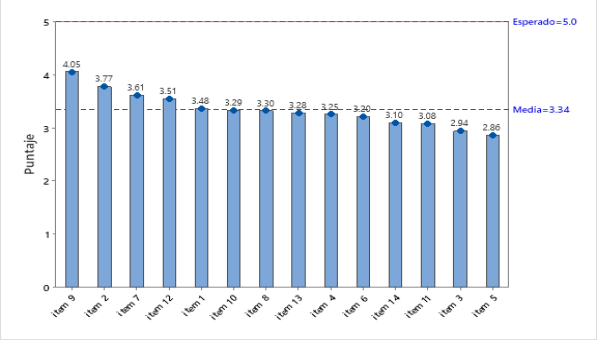

Figure 1. Average learning quality scores

Note. Meaning of Items.

Table 2 shows the estimated model, where: learning quality = 3.187 - 0.1229 (Institution) + 0.0439 (Sex) + 0.0008 (Residential area) - 0.00367 (Professional career) + 0.01584 (Age) + 0.006 (12 Cycle). Therefore, a multiple linear regression of the factor scores in the response variable (learning quality) was applied. In summary, the statistically significant factors ($p<0.05$) were the variable institution and the age of the students. Finally, the adjustment of the estimated model was made, and a coefficient of determination of R2 = 48% was found and adjusted 21.20%, for a prediction of 23.04% of the quality of electronic learning.

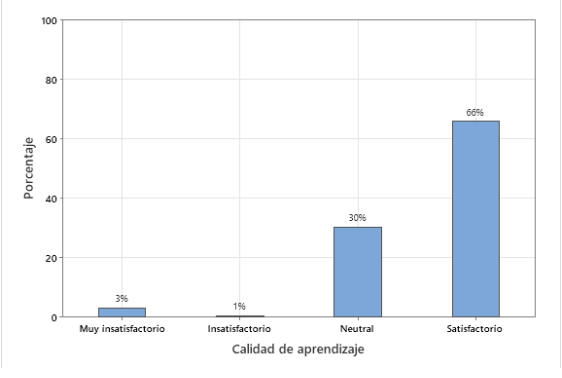

Figure 2 Quality of student learning.

Figure 2 shows that the quality of learning is satisfactory in a higher proportion (66%), neutral (30%), unsatisfactory (1%), very unsatisfactory (3%). In short, students have a satisfactory level of quality of learning.

Table 2 Coefficients of the estimated model.

Coefficients	Coef	EE of the coef.	T-value	P-value
Constant	3.187	0.104	30.7	0.000
Institution	-0.123	0.037	-3.34	0.001*
Sex	0.044	0.033	1.35	0.178
Residential area	0.009	0.036	0.02	0.983
Career	-0.004	0.008	-0.52	0.605
Age	0.016	0.005	3.27	0.001*
Cycle	0.007	0.007	0.93	0.352

Note. Own elaboration according to applied survey.

According to the analysis of variance (Table 3), we can evaluate that the multiple linear regression model (RLM) is statistically significant ($p<0.05$). It is also evident that the institution and age factors are statistically significant factors in the estimated model. However, you can take the other factors as not significant to the estimated model. The same results were obtained in the Pareto chart of standardized effects; That is, at 95% confidence only the institution and age factor are those that pass the limit.

Table 3 Analysis of variance of the estimated model.

Fountain	GL	SC Ajust.	MC Ajust.	F-value	P value
Regression	6	18.974	3.16232	6.37	0.000*
Institution	1	5.54	5.54043	11.15	0.001*
Sex	1	0.901	0.9009	1.81	0.178
Residential area	1	0	0.00023	0	0.983
Career	1	0.133	0.13323	0.27	0.605
Age	1	5.327	5.32678	10.72	0.001*
Cycle	1	0.43	0.43019	0.87	0.352
Error	1894	940.958	0.49681		
Lack of adjustment	825	453.116	0.54923	1.2	0.002
Pure error	1069	487.842	0.45635		
Total	1900	959.932			

Note. Gl=degrees of freedom.

Statistically significant factors.

In Figure 3, the graph of errors or residuals of the estimated model is shown, that is, we see that the errors do have a normal distribution as we can evaluate in the histogram and have a pattern in the adjustments and an ordered trend. Which we can say that the estimated model has a good fit and is a requirement to meet the normality of the errors of the estimated model.

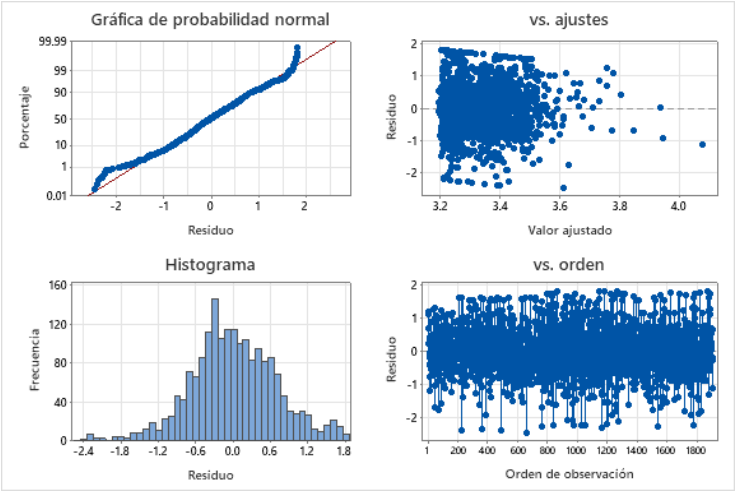

Figure 3 Learning Quality Residuals Graph

4. Discussion

The findings indicate, at an expected average of 5 points, that college students prefer face-to-face communication with their professors and peers because it is more effective ($\overline{X}$ = 4.5); overall, their university offers a high-quality online learning experience ($\overline{X}$=3.77) and they have satisfactory computer skills to handle online courses/assignments ($\overline{X}$=3.61). Such results are similar to those reported by (Barakat et al., 2022) who found that most students also preferred face-to-face communication with their teachers and peers and considered it more effective (n = 682, 72.6%), said median mean perception score was 2.4 (IQR = 1.1). This can be justified in that e-learning is an effective way to meet educational needs, providing more efficient and flexible training. (Sayıner & Ergönül, 2021), or that e-learning resources have become more important for acquiring new knowledge and skills, especially at a time of physical distancing (Sayıner & Ergönül, 2021).

Similarly, as results it was found that university students consider that the university provides them with technical support for e-learning ($\overline{X}$ = 3.51) and that this helps them achieve their future plans (travel, obtain a higher degree, etc.) ($\overline{X}$ = 3.48), as well as, they can easily work in groups with electronic courses ($\overline{X}$ = 3.29). In this regard, a literature review revealed that the success of e-learning relies heavily on understanding the needs and limitations of the target audience. (Polanco et al., 2016); That is, it must be oriented in the first order, to meet the needs and limitations of the student and then, the socio-emotional need. About that(Payne et al., 2009) He showed that the e-learning strategy significantly improves the student's skills even without having the experience in electronic media.

Also, as average results to the accepted average, it was found that students show confidence to ask questions and get answers from teachers quickly electronically ($\overline{X}$ = 3.30), that e-learning leads to an educational overload in students ($\overline{X}$ = 3.28), that they feel comfortable communicating with their teachers and classmates electronically ($\overline{X}$ = 3.25) and that electronic courses help to organize study time and perform academic tasks better than face-to-face university education ($\overline{X}$ = 3.20). For its part, (Slini et al., 2014) experimented with an e-learning course and found that it is an effective and valuable solution for transferring knowledge, making it possible to meet demanding training objectives among geographically dispersed learners. According to (Tërstena & Deda, 2019), with e-learning, teaching can be done at work, at home, at school or anywhere.

Similarly, our study reported below-expected averages, where students consider that e-learning helps generate better ideas than classroom study ($\overline{X}$ = 3.10), that all courses can be taken electronically without difficulties ($\overline{X}$ = 3.08), that they prefer virtual learning to become the new normal ($\overline{X}$ = 2.94) and feel that studying online courses will help them memorize and master them better ($\overline{X}$ = 2.86). Our results coincide with (Alami & El Idrissi, 2022) who in their study found that the acceptance of e-learning depends significantly on student satisfaction, perceived ease of use and perceived usefulness. However (Barakat et al., 2022) It recorded opposite results, since in the universities studied, it found that its students think in a way contrary to ours.

On the other hand, in light of the theories, it is reported that the positive or negative perceptions of users may be linked to technological and practical foundations, adequate or deficient that have caused problems for students, instructors and other people involved. (Zarei & Mohammadi, 2021). There may even be perceptions that traditional teaching is preferred over online teaching among students. (Sindiani et al., 2020). All this may depend on the context; for example, a study conducted in 11 countries reported that 41% reported E-learning interference due to network problems. 60% felt that clinical and practical skills are best learned in clinics and laboratories. More than a third of students preferred classroom teaching and 34% of students did not feel confident enough to take final exams after e-learning sessions (Abbasi et al., 2020). Such results coincide in part with the findings reported here.

Finally, as a finding it was recorded that the quality of electronic learning in the university students evaluated, is satisfactory in greater proportion (66%), neutral (30%) and very unsatisfactory only in 3%. This explains that Peruvian university students have a satisfactory level of learning quality. Opposite results are recorded by (Sindiani et al., 2020), as students who had undergone online learning before the pandemic are more satisfied with their online experience. On the other hand, it is worth arguing that levels of satisfaction with e-learning were better among developed countries (7.34) compared to developing countries (5.82) (Abbasi et al., 2020). Most participants agreed that e-learning was satisfactory for acquiring knowledge, however, it was not effective for acquiring more technical skills. (Abbasi et al., 2020).

Finally, our study reports certain limitations of descriptive designs. (Sánchez & Reyes, 2017) and the bias that online surveys can generate. Therefore, we must take it with some caution and interpret them in favor of finding improvements in the pedagogical practice of e-learning

systems. On the other hand, as a theoretical limitation, it can be indicated that online learning helps maintain social distance between students. (Sindiani et al., 2020); However, this fact brings to reflection, new lights and research to expand the frontiers in this type of knowledge.

5. Conclusion

The quality of e-learning evaluated in university students is of a good level and there is a satisfactory perception in greater proportion. Similarly, the RLM model ($p<0.05$) shows that sociodemographic characteristics such as the institution and age factor are statistically significant, with the exception of sex, residential area, professional career and academic cycle factors.

Acknowledgements

We appreciate the support received from the authorities of the National University Toribio Rodríguez de Mendoza de Amazonas and the University of Piura and the students for their selfless participation in the research.

WORKS CITED

Abbasi, M. S., Ahmed, N., Sajjad, B., Alshahrani, A., Saeed, S., Sarfaraz, S., Alhamdan, R. S., Vohra, F., & Abduljabbar, T. (2020). E-Learning perception and satisfaction among health sciences students amid the COVID-19 pandemic. Work, 67(3), 549–556. https://doi.org/10.3233/WOR-203308

Ahmady, S., Kohan, N., Bagherzadeh, R., Rakshhani, T., & Shahabi, M. (2018). Validity testing of classroom community scale in virtual environment learning: A cross sectional study. Annals of Medicine and Surgery, 36(June), 256–260. https://doi.org/10.1016/j.amsu.2018.08.021

Al-Smadi, A. M., Abugabah, A., & Smadi, A. Al. (2022). Evaluation of E-learning Experience in the Light of the Covid-19 in Higher Education. Procedia Computer Science, 201(C), 383–389. https://doi.org/10.1016/j.procs.2022.03.051

Alami, Y., & El Idrissi, I. (2022). Students' adoption of e-learning: evidence from a Moroccan business school in the COVID-19 era. Arab Gulf Journal of Scientific Research, 40(1), 54–78. https://doi.org/10.1108/AGJSR-05-2022-0052/FULL/PDF

Alvira, F. (2011). The survey: a methodological overview. Center for Sociological Research.

Astin, A. W. (1993). What matters in College: four critical years revisited. Educational Researcher, 22(8), 32. https://doi.org/10.2307/1176821

Barakat, M., Abu, R., Mu, S., Al-tammemi, A. B., Othman, B., Allozi, Y., & Fino, L. (2022). The era of E-learning from the perspectives of Jordanian medical students : A cross-sectional study. In Heliyon (Vol. 8). https://doi.org/10.1016/j.heliyon.2022.e09928

Battista, S., Furri, L., de Biagi, G., Depedri, L., Broggi, V., & Testa, M. (2023). Clinical records after asynchronous and synchronous e-learning courses: a multi-method randomised controlled trial on students' performance and experience. BMC Medical Education, 23(1), 584. https://doi.org/10.1186/s12909-023-04528-2

Carow, S., Schmitz, P., & Pretorius, R. (2023). Spatial perspectives on student profiling to inform open distance e-learning (ODeL) in various geographical contexts: a case study from the Global South. Discover Sustainability, 4(1). https://doi.org/10.1007/s43621-023-00143-9

Cuellar-Quispe, S. , Huaman-Romani, Y.-L. , Sarmiento-Campos, N.-V. , Silvera-Alarcon, E.-N. , & Nolasco-Carbajal, E. . (2023). Perspectives on teaching performance after COVID-19 . International Journal of Innovative Research and Scientific Studies, 6(4), 826–834. https://doi.org/10.53894/ijirss.v6i4.2038

Duki, D., & Stri, J. (2015). Croatian university students ' use and perception of electronic resources. Library & Information Science Research Croatian, 37(June), 244–253. https://doi.org/10.1016/j.lisr.2015.04.004

Förster, M., Weiser, C., & Maur, A. (2018). How feedback provided by voluntary electronic quizzes affects learning outcomes of university students in large classes. Computers and Education, 121(November), 100–114. https://doi.org/10.1016/j.compedu.2018.02.012

Gulliver, S. R., & Ghinea, G. (2006). Defining user perception of distributed multimedia quality. ACM Transactions on Multimedia Computing, Communications and Applications, 2(4), 241–257. https://doi.org/10.1145/1201730.1201731

Hone, K. S., & El Said, G. R. (2016). Exploring the factors affecting MOOC retention: A survey study. Computers and Education, 98, 157–168. https://doi.org/10.1016/j.compedu.2016.03.016

Huamán-Romaní, Y.-L., Garay, J.P.P., Gómez, E.G., Pupuche, P.E.Z., Atho, M.O.F., Fernandez, A.N. (2023a) Perspective on digital competencies in university what's ahead for education? Human Review. International Humanities Review / Revista Internacional de Humanidades, 21 (1), pp. 189-200. https://doi.org/10.37467/revhuman.v21.5046

Huamán-Romaní, Y.-L., Coronel-Chugden, J.-W., Flores-Castillo, M.-M., Gutiérrez-Gómez, E. (2023b) Perspective of the quality of service in e-learning teaching for university students in Peru. Revista de Ciencias Sociales, 29 (ESPECIAL 7), pp. 210-225. https://doi.org/10.31876/rcs.v29i.40459

INEI. (2019). The Peruvian educational system offers about eight thousand professional, pedagogical, technological and technical productive programs. https://bit.ly/45MQ7LC

National Institute of Statistics and Informatics-INEI. (2020). State of Children and Adolescents (Technical Report). In Insitución Nacional de Estadística e informática (p. 56). https://bit.ly/3KYI6Ld

Jenkins, K., Kinsella, E. A., & DeLuca, S. (2021). Being and becoming a nurse: Toward an ontological and reflexive turn in first-year nursing education. Nursing Inquiry, 28(4), 12420. https://doi.org/10.1111/nin.12420

Jung, I. (2011). The dimensions of e-learning quality: From the learner's perspective. Educational Technology Research and Development, 59(4), 445–464. https://doi.org/10.1007/s11423-010-9171-4

Li, L.-Y., & Chin-Chung, T. (2023). Students ' patterns of accessing time in a text structure learning system : relationship to individual characteristics and learning performance. Educational Technology Research and Development, 68(5), 11423. https://doi.org/10.1007/s11423-020-09780-7

Longhini, J., De Colle, B., Rossettini, G., & Palese, A. (2021). What knowledge is available on massive open online courses in nursing and academic healthcare sciences education? A rapid review. Nurse Education Today, 99(September 2020), 104812. https://doi.org/10.1016/j.nedt.2021.104812

Marold, K., Larsen, G., & Moreno, A. (2022). Web-based learning: is it working? A comparison of student performance and achievement in web-based courses and their in-classroom counterparts. In D. B. A. M. Khosrow-Pour (Ed.), Web-Based Instructional Learning. IGI Global. https://doi.org/10.4018/978-1-931777-04-9.ch015

Mojarad, F. A., Hesamzadeh, A., & Yaghoubi, T. (2023). Exploring challenges and facilitators to E-learning based Education of nursing students during Covid-19 pandemic : a qualitative study. BMC Nursing, 22(1), 278. https://doi.org/10.1186/s12912-023-01430-6

Montenegro, M., Clasing, P., Kelly, N., Gonzalez, C., Jara, M., Alarcón, R., Sandoval, A., & Saurina, E. (2016). Library resources and students ' learning outcomes : do all the resources have the same Impact on learning? The Journal of Academic Librarianship, 42(5), 551–556. https://doi.org/10.1016/j.acalib.2016.06.020

Muñoz, C. (2011). How to prepare and advise a thesis research (Vol. 2). Perarson.

Supervisory Agency for State Procurement - OSCE. (2023). List of licensed and denied universities. https://bit.ly/3sDoA0C

Payne, A. M., Stephenson, J. E., Morris, W. B., Tempest, H. G., Mileham, A., & Griffin, D. K. (2009). The use of an e-learning constructivist solution in workplace learning. International Journal of Industrial Ergonomics, 39(3), 548–553. https://doi.org/10.1016/J.ERGON.2008.10.019

Pham, L., Limbu, Y. B., Bui, T. K., Nguyen, H. T., & Pham, H. T. (2019). Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam. International Journal of Educational Technology in Higher Education, 16(1). https://doi.org/10.1186/s41239-019-0136-3

Polanco, J., Ramírez, F., & Orozco, M. (2016). International standards effect on corporate sustainability: A senior managers' perspective. Estudios Gerenciales, 32(139), 181–192. https://doi.org/10.1016/j.estger.2016.05.002

Quacquarelli Symonds (QS). (2023). QS World university rankings 2024: Top global universities.

Ramayah, T., Ahmad, N. H., & Lo, M. C. (2010). The role of quality factors in intention to continue using an e-learning system in Malaysia. Procedia - Social and Behavioral Sciences, 2(2), 5422–5426. https://doi.org/10.1016/j.sbspro.2010.03.885

Salahshouri, A., Eslami, K., Boostani, H., Zahiri, M., Jahani, S., Arjmand, R., Heydarabadi, A. B., & Dehaghi, B. F. (2022). The university students' viewpoints on e-learning system during COVID-19 pandemic: the case of Iran. Heliyon, 8(2), e08984. https://doi.org/10.1016/j.heliyon.2022.e08984

Sánchez, H., & Reyes, C. (2017). Methodology and designs in scientific research. Bissines Support Aneth S.R.l.

Sayıner, A. A., & Ergönül, E. (2021). E-learning in clinical microbiology and infectious diseases. Clinical Microbiology and Infection, 27(11), 1589–1594. https://doi.org/10.1016/J.CMI.2021.05.010

Serrano, R., Elisa, P., Pu, L., & Hurtado-mazeyra, A. (2023). Quality and equity in the Peruvian education system : Do they progress similarly ? International Journal of Educational Research, 119(November 2022). https://doi.org/10.1016/j.ijer.2023.102183

Sindiani, A. M., Obeidat, N., Alshdaifat, E., Elsalem, L., Alwani, M. M., Rawashdeh, H., Fares, A. S., Alalawne, T., & Tawalbeh, L. I. (2020). Distance education during the COVID-19 outbreak: A cross-sectional study among medical students in North of Jordan. Annals of Medicine and Surgery, 59, 186–194. https://doi.org/10.1016/J.AMSU.2020.09.036

Slini, T., Giama, E., & Papadopoulou, C. O. (2014). Distance learning education for mitigation/adaptation policy: a case study. Https://Doi.Org/10.1080/14786451.2013.876026, 35(2), 161–171. https://doi.org/10.1080/14786451.2013.876026

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. Internet and Higher Education, 7(1), 59–70. https://doi.org/10.1016/j.iheduc.2003.11.003

Sulis, I., Giambona, F., & Porcu, M. (2020). Adjusted indicators of quality and equity for monitoring the education systems over time. Insights on EU15 countries from PISA surveys. Socio-Economic Planning Sciences, 69(May 2019), 100714. https://doi.org/10.1016/j.seps.2019.05.005

Tang, C. (2024). The construction and use of a higher education singing art teaching system combining digital multimedia art and information processing technology. Computer-Aided Design and Applications, 21(2), 39–43. https://doi.org/10.14733/cadaps.2024.S2.39-53

Tërstena, A., & Deda, G. (2019). The role of it in the development of distance learning in public and private universities in Kosovo. International Journal of Ecosystems and Ecology Science (IJEES), 9(3), 491–500. https://doi.org/10.31407/ijees

Uppal, M. A., Ali, S., & Gulliver, S. R. (2018). Factors determining e-learning service quality. British Journal of Educational Technology, 49(3), 412–426. https://doi.org/10.1111/bjet.12552

Van, J. (2005). Theory and practice of online learning. Athabasca University. https://doi.org/10.1111/j.1467-8535.2005.00445_1.x

Vasconcelos, P., Furtado, E. S., Pinheiro, P., & Furtado, L. (2020). Computers in human behavior multidisciplinary criteria for the quality of e-learning services design. Computers in Human Behavior, 107(April 2019), 105979. https://doi.org/10.1016/j.chb.2019.04.003

Veeramanickam, M. R. M., & Ramesh, P. (2022). Advances in engineering software analysis on quality of learning in e-learning platforms. Advances in Engineering Software, 172(March), 103168. https://doi.org/10.1016/j.advengsoft.2022.103168

Veeramanickam, M., & Ramesh, P. (2022). Analysis on quality of learning in e-Learning platforms. Advances in Engineering Software, 172(May), 103168. https://doi.org/10.1016/j.advengsoft.2022.103168

Vilcapoma-Malpartida, P.-M., Vilcañaupa-Toralava, G.-M., Huamán-Romaní, Y.-L., Aragón-Navarrete, R.-N., Huaraca-Aparco, R., Machaca-Mamani, J.-C. (2023) Perspectives of environmental awareness in university students. Human Review. International Humanities Review, 21 (1), pp. 201-213. https://doi.org/10.37467/revhuman.v21.5048

Zarei, S., & Mohammadi, S. (2021). Challenges of higher education related to e-learning in developing countries during COVID-19 spread: a review of the perspectives of students, instructors, policymakers, and ICT experts. Environmental Science and Pollution Research, 29(57), 85562–85568. https://doi.org/10.1007/S11356-021-14647-2/FIGURES/2