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Innovative strategies for continuous and effective learning during health emergencies in Ciudad del Este

Estrategias innovadoras para un aprendizaje continuo y efectivo durante emergencias sanitarias en Ciudad del Este

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ABSTRACT

The present research, centered on Ciudad del Este, addressed the articulation and implementation of innovative strategies to ensure the perpetuity and effectiveness of learning in contexts of health emergencies. The exploration focused on distance education modalities, intensively integrating digital technologies and online resources. Adopting an exploratory-descriptive methodology, data collection was carried out through surveys to examine the emergent educational practices during the health crisis meticulously. The findings underscore the pivotality of distance education and technologization to ensure educational continuity while simultaneously identifying preponderant challenges, such as equity in educational access and active student participation. The proffered results provide a wealth of cardinal information for educational entities, teaching professionals, and decision-makers, facilitating the understanding and optimizing educational strategies in crises. In conclusion, this study highlights the imperative need to deploy innovative pedagogical approaches in health emergencies, pointing to distance education and implementing digital technologies as preeminent solutions to ensure continuous and quality education in the studied region. Such strategies not only lean towards the resilience of the current educational system but also pave the way for robust preparation in the face of future challenges.

Keywords: adaptation, distance education, resilience, digital technologies, transformation.

JEL Classification: I21; I25

RESUMEN

La presente investigación, centrada en la ciudad de Ciudad del Este, abordó la articulación e implementación de estrategias innovadoras para asegurar la perpetuidad y efectividad del aprendizaje en contextos de emergencias sanitarias. La exploración se enfocó en modalidades de educación a distancia, integrando intensivamente tecnologías digitales y recursos en línea. Adoptando una metodología de naturaleza exploratoria-descriptiva, la recolección de datos se efectuó mediante encuestas, orientadas a examinar meticulosamente las prácticas educativas emergentes durante la crisis sanitaria. Los hallazgos subrayan la pivotalidad de la educación a distancia y la tecnologización para asegurar la continuidad educativa, simultáneamente identificando desafíos preponderantes tales como la equidad en el acceso educativo y la participación estudiantil activa. Los resultados proferidos proveen un cúmulo de información cardinal para entidades educativas, profesionales docentes y agentes decisores, facilitando el entendimiento y optimización de estrategias educativas en situaciones de crisis. En conclusión, este estudio resalta la imperativa necesidad de desplegar estrategias pedagógicas innovadoras en coyunturas de emergencias sanitarias, señalando la educación a distancia y la implementación de tecnologías digitales como soluciones preeminentes para garantizar una educación continua y de calidad en la región estudiada. Tales estrategias no solo propenden a la resiliencia del sistema educativo actual, sino que también pavimentan el camino para una preparación robusta ante desafíos futuros.

Palabras clave: adaptación, educación a distancia, resiliencia, tecnologías digitales, transformación.

Clasificación JEL: I21; I25

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INTRODUCTION

The relevance of this topic lies in the imperative need to prepare for the future and develop innovative strategies

to ensure continuous and effective learning during health emergencies (Izumi et al., 2021; Aruru et al., 2021). Excellent training ensures students develop the personal and professional skills required for their degree. This means creating the right conditions to provide the best possible service, even under adverse conditions (Tang et al., 2021).

The impact of technologies, their integration into educational contexts, and the boom in educational content creation have led to multiple periods of change (Scherer et al., 2021; Tondeur et al., 2019). Efforts have been aimed at strengthening teaching and research through virtual environments and varied forms of communication (Bruggeman et al., 2021).

The availability of computers and other electronic devices has contributed to generating opportunities for asynchronous exchange, online research, group advising through digital platforms, support for educational innovation, and other transformations (Shamir-Inbal & Blau, 2021; Tokareva et al., 2019). These changes have represented in various contexts the fundamental factors behind the new identities of educational agents, as well as their mission and roles in Higher Education.

A clear example of migration to virtual environments, although forced, occurred in the wake of the Covid-19 pandemic, a period in which educational institutions, especially those of Higher Education, moved their teaching and learning processes to virtual environments, relying on messaging services or virtual platforms such as Zoom or Google Meet (Affouneh et al., 2021; Alarabiat et al., 2023; Ray & Srivastava, 2020). Due to the urgent nature and conditioned by a global context of crisis, many of these modifications were carried out precariously, without sufficient data to support decision-making and on a trial-and-error basis (Essel et al., 2021; Oliveira et al., 2021).

Because curricular adaptations and the virtualization of processes required specialized training on the part of managers, faculty, and students, opportunities were missed, inaccuracies were committed, or the necessary socio-psychological climate was not achieved (Brammer & Clark, 2020; Salas-Pilco et al., 2022). This last fact, undoubtedly marked by the dire consequences of the pandemic, also hindered technological integration as an already complex process, even in a normal situation.

Technological integration, which for some authors has the classroom as its fundamental space (Abel et al., 2022; Ifinedo et al., 2020), is a broader process and includes the information literacy of teachers, students, and other social agents involved in decision-making (Brørs et al., 2020; Gu & Feng, 2022; Kjellsdotter, 2020). In addition to using the technology itself, either because it favors exploitation in the educational area or was designed for that purpose, linguistic, psychological, and social aspects must be considered.

An essential aspect that stands out in the convergence of these factors is the importance of the use of technologies as a way to attenuate the generation gap and achieve a dialogue with the student body. Therefore, training, continuous education, and improvement of teaching skills is an imperative, as well as a tool for achieving the shared goals of teachers, students, and the institution (Händel et al., 2022; Paliwal & Singh, 2021; Rafique et al., 2021).

However, the virtualization of processes is not free of difficulties, as there are technological barriers (access or connectivity), psychological barriers, and barriers related to the didactic transfer of knowledge and competence development (Iivari et al., 2020; Sophonhiranrak, 2021; Wilson et al., 2020). From the teaching perspective, this transition implies the recognition that virtualization is a complex meta-process, which requires solid preparation in terms of technology management and the gnoseological and practical models that guide its implementation.

Elements of synchronous and asynchronous communication, of digital interaction as opposed to collaborative processes in face-to-face environments, as well as the exploration of new ways to accompany students, mark the learning of teachers with less experience in these models. Didactically speaking, teaching and research assume an essential part of design in face-to-face contexts. However, the management of knowledge and student spaces gains in importance, and the professor, in addition to his role as a designer, becomes a support and guide for the development of the program.

Even in normality, there are still marked difficulties in using ICT in educational contexts (Ratten, 2023). In addition to psychological resistance, now that a global pandemic does not condition virtualization, the high costs of applications and electronic devices, the difficulty of customizing (for both teacher and students) blended learning models, and other factors have hindered the systematization of experiences.

However, it is necessary to recognize that, despite these obstacles, the use of virtual tools has gained space

and popularity and diversified in terms of exploitation possibilities. Whether in a face-to-face situation and the integration of ICTs into the teaching process or the use in semi-face-to-face designs, technological integration has facilitated the personalization of training, efficiency, the promotion of autonomous development, and self-management of knowledge, among other cardinal aspects in the current context.

Consequently, preparation for the design and use of virtual spaces has become a central task for educational institutions and agents that aspire to remain relevant and competitive in an increasingly complex and digitized market. Therefore, an innovative pedagogy is needed to generate spaces for self-development that, without renouncing collaborative learning, strengthens learning processes based on clear didactics and the design of social interactions.

This implies awareness of the sociological particularities of students, who are increasingly closer to digital nativity, the differences between informational skills, and the management of expectations regarding the use of technologies and learning in virtual environments. In addition, platforms such as Moodle, YouTube channels, digital sites, blogs, and other alternatives that make the didactic proposal more similar to the hyperconnected environments in which daily life is developed have also become more popular.

In a general sense, it is necessary to reconcile the experiences consolidated during the Covid-19 pandemic, the development of the virtualization of teaching and learning prior to this period, and new initiatives. In this way, distance or blended modalities (b-learning) should be established correctly and in order. This entails carefully examining social conditioning factors, educational and technological gaps, and the role of educational agents.

Because of the primordial nature of their role in the organization, control, and evaluation of these processes, the study presented here sought to understand the learning obtained during COVID-19. Likewise, we explored the knowledge related to the main innovative strategies for continuous and effective learning during health emergencies of teachers in Ciudad del Este.

METHODS

Approach

Considering the stated objectives and the problematization of the research interest in learning about innovative strategies and notable experiences for future health emergencies, a quantitative study of descriptive exploratory scope was designed. According to Hernández and Mendoza (2018), this type of study aims to examine research problems that are little known or insufficiently addressed in the literature. Therefore, we explored the relationship between innovative strategies and preparation for future scenarios from the teachers' perspectives and experiences.

Design

The quantitative approach was executed by administering a questionnaire to teachers from different educational institutions in Ciudad del Este. The objective of this design was to obtain statistical indicators that would facilitate a deeper understanding of the behavior of implementing innovative strategies during health emergencies in the city above. The research design adopted a transactional nature, with a time frame limited to three months, and was implemented at a single cut-off point. It should be noted that the deadlines stipulated by the institution conditioned this strategy.

By the exploratory nature of the proposal, this approach proved to be the most pertinent path, although the need to broaden the sample and conduct additional research, particularly those of mixed design and with a scope beyond the mere exploration of the phenomenon, is recognized. For future research, we suggest using designs that make possible the construction of theoretical or practical models for implementing such strategies.

Population and sample

After a review of the teaching staff of the different educational institutions, the estimated population was N=136. Using the Decision Analyst STATS 2.0 program, the sample was calculated through simple random sampling with a confidence level of 95% and a margin of error of 5%. According to Hernandez and Mendoza (2018), the main advantage of this type of sampling is that each case has the same probability of being chosen at the beginning.

Sample size: = ((Z^2 Xp (1-p))/e^2)/ (1+ ((Z^2 Xp (1-p))/e^2))
N = population size
e = margin of error (percentage expressed with decimals)
z = z-score

Data collection

Data collection was carried out through the application of a survey of closed questions with multiple options and a rating scale in the form of a questionnaire, with prior approval of informed consent. The survey had three dimensions and seven indicators designed to examine strategies, technologies, obstacles, opportunities, and measures to maximize achievements and counteract limitations.

Table 1.
Dimensions and indicators in the exploration of innovative strategies.

Dimensions	Indicators	Design
Innovative strategies and perceived impact.	1- Innovative educational strategies that were implemented at the institution to ensure continuity of learning during the pandemic.	Question. 6 default options. Input option.
	2- Evaluation of the impact of distance learning strategies implemented during the pandemic on student learning.	Scale. Perceived impact 1-5.
Technologies and challenges in their implementation	3- Digital technologies generated to facilitate distance learning in the educational institution.	Question. 6 default options. Input option.
	4- Main challenges you faced as a teacher during distance learning during the pandemic.	Question. 5 default options. No input option.
Learnings and measures to ensure future success.	5- Opportunity or benefit during the distance learning.	Question. 5 default options. No input option.
	6- Actions considered necessary to overcome identified challenges and take advantage of opportunities in future health emergencies.	Question. 5 default options. Input option.

Source: own elaboration

RESULTS

Type of institution

Of the 100 teachers surveyed, 40% stated they worked in a public institution during the pandemic, and 60%

answered private institution. These data must be understood in terms of budget implications, the distribution of the student/teacher role, and the institution's infrastructure. Other studies have addressed the need to understand this division better and the differentiated impact of public policies to address these scenarios of socio-health emergencies (Canese et al., 2021; La Paz & Arrúa, 2019).

Indicator 1.

Of the 100 teachers surveyed, 40% stated that distance education was the model they implemented in the institution to ensure continuity of learning, 10% answered the use of the online platform, 10% virtual classes in real-time, while another 10% online homework assignments and activities and 30% use of digital educational resources. It was determined that most of the teachers identified distance education as a way to use digital resources with a significant contribution.

These results coincide with those found in similar studies, which allude to videoconferences and other forms of instruction through audiovisuals and individual offline or asynchronous work, among other alternatives (Rodas et al., 2021). These results suggest the need to carefully explore teachers' representation of the concept of distance education in future studies and how the strategies mentioned interact with this representation. There is a particular need to study certain forms of communication and how they are used to differentiate strategies within the broad model of distance education, judging by the results of similar research (Picón et al., 2021).

Indicator 2

Regarding evaluating the impact of the distance education strategies implemented during the pandemic on their students' learning, 50% stated that the strategies were very ineffective, 10% answered not very effective, 10% neutral, while another 20% effective and 10% very effective. It was determined that the general representation tends to point out the educational strategies as ineffective, which is an element to consider due to the negative characterization of the distance education model and the results obtained through its implementation.

These results lead to reasoning about the different factors related to the negative polarity of the perceived impact. Other studies that have dealt with this problem raise economic and access factors, lack of preparation of teachers, family members, and students, as well as the surprise originated by the health situation and poor decision-making (Canese et al., 2021; Galván-Jara, 2021; Rodas et al., 2021).

Indicator 3

Of the 100 teachers surveyed, in terms of digital technologies generated to facilitate distance learning in the educational institution, 25% stated that online learning platforms were used, 15% answered online mobile applications, 10% videoconferencing, while another 10% email and 40% WhatsApp (see Figure 3). It is concluded that a high percentage of teachers surveyed if the percentage distribution and recommended avenues are taken into account, used WhatsApp to facilitate distance learning in their educational institutions. Although using messaging services, which various researchers also consider social networks, has been highlighted by several studies as a way for accompaniment, it could be better for educational use, at least exclusively. In addition to not being designed for such purposes, it could undermine the use of other, more appropriate resources.

Indicator 4

Regarding the main challenges faced during the pandemic, 30% stated that it was the limited access to the Internet for some students, 10% answered difficulty in maintaining student motivation, 10% difficulty in evaluating learning effectively, 40% lack of training in the use of digital technology, and 10% difficulty in maintaining student interaction and active participation. These results represent the complex panorama faced by teachers in Ciudad del Este, especially the aspects related to teacher training needs for the use of ICT and access limitations, both contrasted in the literature consulted (Cañete et al., 2021; Brítez, 2020).

Indicator 5

Regarding opportunities and benefits during distance learning, 20% indicated flexibility in the study schedule, 20% answered greater student autonomy and responsibility, 10% access to quality online educational resources, 10% greater collaboration and teamwork in virtual environments, and 40% more affordable costs. It is concluded that a large percentage of teachers surveyed identified more accessible costs as the most critical opportunity or

benefit during distance learning, a fact that has been endorsed in previous studies (Ferrer, 2021).

Indicator 6

Regarding the measures they consider necessary to overcome the challenges identified and take advantage of opportunities in future health emergencies, 40% stated that more significant investment in technological infrastructure and internet access is required, 40% teacher training in the use of digital technologies, 10% development of evaluation strategies; finally, the remaining 10% pointed out the need to promote collaboration among teachers and share good practices. It is concluded that an equal percentage of 40% of the surveyed teachers identified as measures to overcome the identified challenges and take advantage of opportunities in future situations a more significant investment in technological infrastructure and internet access and teacher training in the use of digital technologies.

These results highlight those found in previous indicators and allow for a better assessment of the factors to be considered in terms of decision-making for the preparation of educational institutions in the event of health emergencies, but also for the implementation of mixed models and technological integration. These results coincide with those revealed by similar studies, which state that the lack of training and the problems of infrastructure and teaching resources have been an obstacle to abandoning traditional education models (Canese et al., 2021; Cañete et al., 2021).

DISCUSSION

It was possible to verify that the educational institutions studied in Ciudad del Este, taking into account the analysis of the survey on distance education, reveal a mixed picture. Although most of the teachers surveyed work in private institutions and have used distance education, there is a generalized perception that the strategy implemented was ineffective. This indicates the need to review and improve the approaches used in remote learning in the region and their integration into institutional plans for effective and comprehensive coping (Izumi et al., 2021).

WhatsApp as a learning platform is a popular tool among teachers in Ciudad del Este, highlighting the importance of instant communication in the virtual environment. However, significant challenges, such as limited internet access and lack of training in digital technologies, were also identified. These challenges must be addressed to ensure equitable and effective distance education in the region (Salas-Pilco et al., 2022), especially regarding motivation and personalized attention to specific groups (Tang et al., 2021).

On the other hand, teachers recognized valuable opportunities in distance learning, such as more accessible costs and greater flexibility in the study schedule. These benefits can improve accessibility and work-study balance for teachers and students in Ciudad del Este. However, providing adequate training for teachers to take full advantage of these opportunities and develop effective teaching strategies in the virtual environment is essential. It is vital that this training provides the necessary tools for the virtualization of the teaching-learning process and the strengthening of students' intentions to continue in virtual environments (Alarabiat et al., 2023).

Given the challenges identified, it is evident that more significant investment in technological infrastructure and Internet access is essential to improve distance education in educational institutions in Ciudad del Este. In addition, it is necessary to prioritize teacher training in digital technologies to ensure quality and healthy distance learning (Oliveira et al., 2021). These measures, together with the promotion of relevant public policies, are fundamental to overcoming current challenges and better preparing for future health emergencies, ensuring that distance education is effective, inclusive, and equitable in the region (Brammer & Clark, 2020; Sharma & Sharma, 2022).

CONCLUSIONS

The current context demands a critical pedagogy committed to the processes of change that are taking place at an accelerated pace worldwide. One of the areas where the impact of these transformations is most clearly perceived is education. In addition to bequeathing the knowledge of humanity, it is necessary to prepare new generations to face increasingly complex professional and social challenges.

The pandemic caused by the COVID-19 virus revealed the limited preparation of educational systems to face health situations, especially in terms of educational strategies in virtual conditions.

In the case of Ciudad del Este, this global trend was equally appreciated, expressed in the poor effectiveness perceived by teachers in terms of the strategies implemented, which consisted essentially of the use of digitalized educational resources, the transfer of contents designed in the face-to-face framework to virtuality, the use of social networks and messaging services.

The findings highlight the importance of continuing to deepen the strategies, the design of decision-making to support the improvement of infrastructure and teacher training, and the participation of the educational agents involved. In addition, the results highlight the importance of new studies that contribute to the preparation for coping with crises and future health events that compromise the normal development of the educational process but also contribute to continuous information literacy and technological integration in contexts of normality.

As for future research, additional studies should be conducted to deepen the causes and solutions to the challenges identified and explore new strategies and educational tools that can improve the effectiveness of distance education in Ciudad del Este. Likewise, it is necessary to investigate the experiences and opinions of students to obtain a more complete picture of the educational situation in the region during the pandemic.

REFERENCES

Abel, V., Tondeur, J. y Sang, G. (2022). Teacher Perceptions about ICT Integration into Classroom Instruction. *Education Sciences*, 12(9), 609. https://doi.org/10.3390/educsci12090609

Affouneh, S., Khlaif, Z., Burgos, D. y Salha, S. (2021). Virtualization of Higher Education during COVID-19: A Successful Case Study in Palestine. *Sustainability*, 13(12), 6583. https://doi.org/10.3390/su13126583

Alarabiat, A., Hujran, O., Soares, D. y Tarhini, A. (2023). Examining students' continuous use of online learning in the post-COVID-19 era: an application of the process virtualization theory. *Information Technology & People*, 36(1), 21-47. https://doi.org/10.1108/ITP-02-2021-0142

Aruru, M., Truong, H. y Clark, S. (2021). Pharmacy Emergency Preparedness and Response (PEPR): a proposed framework for expanding pharmacy professionals' roles and contributions to emergency preparedness and response during the COVID-19 pandemic and beyond. *Research in Social and Administrative Pharmacy*, 17(1), 1967-1977. https://doi.org/10.1016/j.sapharm.2020.04.002

Brammer, S. y Clark, T. (2020). COVID-19 and Management Education: Reflections on Challenges, Opportunities, and Potential Futures. *British Journal of Management*, 31(3), 453-456. https://doi.org/10.1111/1467-8551.12425

Brítez, M. (2020). La educación ante el avance del COVID-19 en Paraguay. Comparativo con países de la Triple Frontera. SciELO Preprints. https://doi.org/10.1590/SciELOPreprints.22

Brørs, G., Norman, C. y Norekvål, T. (2020). Accelerated importance of eHealth literacy in the COVID-19 outbreak and beyond. *European Journal of Cardiovascular Nursing*, 19(6), 458-461. https://doi.org/10.1177/1474515120941307

Bruggeman, B., Tondeur, J., Struyven, K., Pynoo, B., Garone, A. y Vanslambrouck, S. (2021). Experts speaking: Crucial teacher attributes for implementing blended learning in higher education. *The Internet and Higher Education*, 48, 100772. https://doi.org/10.1016/j.iheduc.2020.100772

Canese, V., Mereles, J. y Amarilla, J. (2021). Educación remota y acceso tecnológico en Paraguay: perspectiva de padres y alumnos a través del COVID-19. *Trilogía Ciencia Tecnología Sociedad*, 13(24), 32-54. https://doi.org/10.22430/21457778.1746

Cañete, D., Cáceres, E., Soto-Varela, R. y Gómez, M. (2021). Educación a distancia en tiempo de pandemia en Paraguay. *Edutec. Revista Electrónica De Tecnología Educativa*, (76), 181-196. https://doi.org/10.21556/edutec.2021.76.1889

Essel, H., Vlachopoulos, D., Tachie-Menson, A., Johnson, E. y Ebeheakey, A. (2021). Technology-Induced Stress, Sociodemographic Factors, and Association with Academic Achievement and Productivity in Ghanaian Higher Education during the COVID-19 Pandemic. *Information*, 12(12), 497. https://doi.org/10.3390/

info12120497

Ferrer, R. (2021). Rendimiento de estudiantes universitarios en dos modalidades antes y durante la pandemia del covid-19. REVISTA PARAGUAYA DE EDUCACIÓN A DISTANCIA (REPED), 2(2), 80-90. https://revistascientificas.una.py/index.php/REPED/article/view/2251

Galván-Jara, I. (2021). Las clases virtuales durante la pandemia de COVID-19. *FEM: Revista de la Fundación Educación Médica*, 24(3), 159-159. https://doi.org/10.33588/fem.243.1129

Gu, C. y Feng, Y. (2022). Influence of Public Engagement with Science on Scientific Information Literacy During the COVID 19 Pandemic. *Science & Education*, 31, 619-633. https://doi.org/10.1007/s11191-021-00261-8

Händel, M., Stephan, M., Gläser-Zikuda, M., Kopp, B., Bedenlier, S. y Ziegler, A. (2022). Digital readiness and its effects on higher education students' socio-emotional perceptions in the context of the COVID-19 pandemic. *Journal of Research on Technology in Education*, 54(2), 267-280. https://doi.org/10.1080/15391523.2020.1846147

Hernández, R. y Mendoza, C. (2018). Metodología de la Investigación: Las rutas cuantitativa, cualitativa y mixta (1ra ed.). Ciudad de México, México: McGraw-Hill Interamericana.

Ifinedo, E., Rikala, J. y Hämäläinen, T. (2020). Factors affecting Nigerian teacher educators' technology integration: Considering characteristics, knowledge constructs, ICT practices and beliefs. *Computers & Education*, 146, 103760. https://doi.org/10.1016/j.compedu.2019.103760

Iivari, N., Sharma, S. y Ventä-Olkkonen, L. (2020). Digital transformation of everyday life – How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management*, 55, 102183. https://doi.org/10.1016/j.ijinfomgt.2020.102183

Izumi, T., Sukhwani, V., Surjan, A. y Shaw, R. (2021). Managing and responding to pandemics in higher educational institutions: initial learning from COVID-19. *International Journal of Disaster Resilience in the Built Environment*, 12(1), 51-66. https://doi.org/10.1108/IJDRBE-06-2020-0054

Kjellsdotter, A. (2020). What matter(s)? A didactical analysis of primary school teachers' ICT integration. *Journal of Curriculum Studies*, 52(6), 823-839. https://doi.org/10.1080/00220272.2020.1759144

La Paz, A. y Arrúa, K. (2019). Mapa de las aspiraciones de la educación superior en Paraguay. Revista del CLAD Reforma y Democracia, (74), 135-158. https://www.redalyc.org/journal/3575/357560862006/357560862006.pdf

Oliveira, G., Teixeira, J., Torres, A. y Morais, C. (2021). An exploratory study on the emergency remote education experience of higher education students and teachers during the COVID-19 pandemic. *British Journal of Educational Technology*, 52(4), 13112. https://doi.org/10.1111/bjet.13112

Paliwal, M. y Singh, A. (2021). Teacher readiness for online teaching-learning during COVID – 19 outbreak: a study of Indian institutions of higher education. *Interactive Technology and Smart Education*, 18(3), 403-421. https://doi.org/10.1108/ITSE-07-2020-0118

Picón, G., González de Caballero, G. y Paredes, J. (2021). Desempeño y formación docente en competencias digitales en clases no presenciales durante la pandemia COVID-19. *ARANDU UTIC*, 8(1), 139-153. http://www.utic.edu.py/revista.ojs/index.php/revistas/article/view/129

Rafique, G., Mahmood, K., Warraich, N. y Rehman, S. (2021). Readiness for Online Learning during COVID-19 pandemic: A survey of Pakistani LIS students. *The Journal of Academic Librarianship*, 47(3), 102446. https://doi.org/10.1016/j.acalib.2021.102346

Ratten, V. (2023). The post COVID-19 pandemic era: Changes in teaching and learning methods for management educators. *The International Journal of Management Education*, 21(2), 100777. https://doi.org/10.1016/j.ijme.2023.100777

Ray, S. y Srivastava, S. (2020). Virtualization of science education: a lesson from the COVID-19 pandemic. *Journal of Proteins and Proteomics*, 11, 77–80. https://doi.org/10.1007/s42485-020-00038-7

Rodas, C., Flores, F. y Alfonso, F. (2021). Los docentes de instituciones educativas del nivel medio de Paraguay y la enseñanza a distancia, durante la pandemia de Covid-19. *La Saeta Universitaria Académica y de Investigación*, 10(2), 81-105. https://doi.org/10.56067/saetauniversitaria.v10i2.294

Salas-Pilco, S., Yang, Y. y Zhang, Z. (2022). Student engagement in online learning in Latin American higher education during the COVID-19 pandemic: A systematic review. *British Journal of Educational Technology*, 53(3), 593-619. https://doi.org/10.1111/bjet.13190

Scherer, R., Howard, S., Tondeur, J. y Siddiq, F. (2021). Profiling teachers' readiness for online teaching and learning in higher education: Who's ready? Computers in Human Behavior, 118, 106675. https://doi.org/10.1016/j.chb.2020.106675

Shamir-Inbal, T. y Blau, I. (2021). Characteristics of pedagogical change in integrating digital collaborative learning and their sustainability in a school culture: e-CSAMR framework. *Journal of Computer Assisted Learning*, 37(3), 825-838. https://doi.org/10.1111/jcal.12526

Sharma, S. y Sharma, M. (2022). Impact of Digital Transformation on Academicians' Well-being: A Study with the Moderating Role of Public and Private Universities in India. *Digital Education Review*, (42), 118-135. https://doi.org/10.1344/der.2022.42.118-135

Sophonhiranrak, S. (2021). Features, barriers, and influencing factors of mobile learning in higher education: A systematic review. *Heliyon*, 7(4), e06696. https://doi.org/10.1016/j.heliyon.2021.e06696

Tang, Y., Chen, P., Law, K., Wu, C., Lau, Y.-y., Guan, J., . . . Ho, G. T. (2021). Comparative analysis of Student's live online learning readiness during the coronavirus (COVID-19) pandemic in the higher education sector. *Computers & Education*, 168, 104211. https://doi.org/10.1016/j.compedu.2021.104211

Tokareva, E., Smirnova, Y. y Orchakova, L. (2019). Innovation and communication technologies: Analysis of the effectiveness of their use and implementation in higher education. *Education and Information Technologies*, 24, 3219–3234. https://doi.org/10.1007/s10639-019-09922-2

Tondeur, J., Scherer, R., Baran, E., Siddiq, F., Valtonen, T. y Sointu, E. (2019). Teacher educators as gatekeepers: Preparing the next generation of teachers for technology integration in education. *British Journal of Educational Technology*, 50(3), 1189-1209. https://doi.org/10.1111/bjet.12748

Wilson, M., Ritzhaupt, A. y Cheng, L. (2020). The impact of teacher education courses for technology integration on pre-service teacher knowledge: A meta-analysis study. *Computers & Education*, 156, 103941. https://doi.org/10.1016/j.compedu.2020.103941

CONFLICT OF INTEREST STATEMENT
The authors declare that there is no conflict of interest.

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