Migration Letters

Volume: 20, No: S3(2023), pp. 1173-1184

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)
www.migrationletters.com

Impact of New Technologies on Student Competencies in Higher Education

Manuel David Isín Vilema, Riobamba[1], Manuel Denis Renato Sanchez Orellana[2], Verónika Alarcón[3], Maritza Ceballos-Saavedra[4]

Abstract

A documentary review was carried out on the production and publication of research papers related to the study of the variables New Technologies, Student Competencies, Higher Education as online resources within the different study methodologies at the university level. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2017-2022 by Latin American institutions. The information provided by this platform was organized through graphs and figures, categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors on the proposed topic is referenced through a qualitative analysis. Among the main findings made through this research, it is found that Mexico, with 41 publications, was the Latin American country with the highest scientific production registered in the name of authors affiliated with institutions of that nation. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material related to the study of the implementation of new technologies and their impact on student competencies in university education was Social Sciences with 48 published documents, and the Type of Publication that was most used during the period indicated above was the Journal Article, which represents 48% of the total scientific production.

Keywords: *New Technologies, Student Competencies, Higher Education.*

1. Introduction

In the landscape of higher education where evolution is growing rapidly, the integration of new technologies has marked a before and after, leaving behind a traditional era of learning and giving way to a new transformative model for education where not only undergraduate students learn, but with this they help to strengthen their acquired skills. The 21st century has been marked by a promising rise at the forefront of technology, where innovation has been a key pillar in the education process, from the advent of artificial intelligence and virtual reality to the implementation of online learning and data analysis. These changes have not only set and broadened new horizons, but also open up the various educational possibilities and thus transform the skills that need them in order to develop and contribute new knowledge to this interconnected digital world.

[1] National University of Chimborazo, misin@unach.edu.ec, https://orcid.org/0000-0003-3617-2173
[2] Universidad Privada San Juan Bautista, mdrenatos@gmail.com, https://orcid.org/0000-0002-4917-1201
[3] Universidad Católica de Santa María, valarcon@ucsm.edu.pe, https://orcid.org/0000-0002-3348-553X
[4] Professor of the Audiovisual Communication Department, Universidad de la Sabana, ceballosmaritza@yahoo.es, https://orcid.org/0000-0002-2765-8385

The impact of new technologies on the skills of students in higher education is multifaceted. Traditionally, higher education has been synonymous with the acquisition of theoretical knowledge, critical thinking, and new problem-solving skills. However, in the digital age, the definition of a holistic education has expanded to encompass new skills. With this comprehensive approach to education, undergraduate students are expected not only to master the skills required by institutions, but also to explore new skills and learn from the digital competencies offered by the current digital age to improve their level of information.

This metamorphosis is driven by many key factors. In the first instance, the prevalence of technology in everyday life has required students in training to develop digital textualization skills, which allow them to effectively access, evaluate, and use digital information fields. In addition, the growing demand for a highly qualified workforce in the field of Science, Technology, Engineering and Mathematics (STEM) has taken on greater relevance in technical skills, information coding and data analysis. Beyond the technical skills offered by new technologies, the digital age demands a greater mastery of adaptability, creativity and communication skills, since as these new strategies and competencies are introduced, students in training must have collaborative learning and improved by technology.

These paradigm shifts, traditions implemented in higher education, have not only influenced academic loads, but also the methodologies implemented by teachers. The use of online platforms, E-Learning and interactive simulations have redesigned the classroom experience, allowing students to improve their learning experiences and as a result, students are not only consumers of information, but also creators and collaborators and problem solvers in their educational journey.

In such circumstances, it becomes imperative to explore the multifaceted impact that the impact of new technologies has on students' competencies in higher education. This article delves into how these new technologies have transformed the traditional educational paradigm, the skills that are in high demand, and the challenges that institutions face when implementing these educational skills. As we explore the digital frontier, it is of paramount importance to ensure that undergraduate students have the essential skills to thrive in an increasingly complex and interconnected world. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables New Technologies, Student Competencies, Higher Education as online resources within the different study methodologies at the university levelLike this. Such as the description of the position of certain authors affiliated with Latin American institutions, during the period between 2017 and 2022.

2. General Objective

To analyze, from a bibliometric and bibliographic perspective, the production of research papers on the variables New Technologies, Student Competencies, Higher Education registered in Scopus during the period 2017-2022 by Latin American institutions.

3. Methodology

A quantitative analysis of the information provided by Scopus is carried out under a bibliometric approach on the scientific production related to the study of the variables New Technologies, Student Competencies, Higher Education. Likewise, from a qualitative perspective, examples of some research works published in the area of study mentioned above are analyzed, from a bibliographic approach to describe the position of different authors regarding the proposed topic.

The search is carried out through the tool provided by Scopus and parameters referenced in Figure 1 are established.

3.1 Methodological design

Figure 1. Methodological design

Source: Authors' own creation

3.1.1 Phase 1: Data collection

Data collection was carried out through the Search tool on the Scopus website, through which a total of 92 publications were identified. To this end, search filters were established consisting of:

- ✓ Published documents whose study variables are related to the study of New Technologies, Student Competencies, Higher Education.
- ✓ Limited to Latin American countries.
- ✓ Without distinction of area of knowledge.
- ✓ No distinction of type of publication.

3.1.2 Phase 2: Construction of analytical material

The information identified in the previous phase is organized. The classification will be made by means of graphs, figures and tables based on data provided by Scopus.

- ✓ Co-occurrence of Words.
- ✓ Year of publication
- ✓ Country of origin of the publication.
- ✓ Area of knowledge.
- ✓ Publication Type

3.1.3 Phase 3: Drafting of conclusions and outcome document

After the analysis carried out in the previous phase, we proceed to the drafting of the conclusions and preparation of the final document.

4. Results

4.1 Co-occurrence of words

Figure 2 shows the co-occurrence of keywords within the publications identified in the Scopus database.

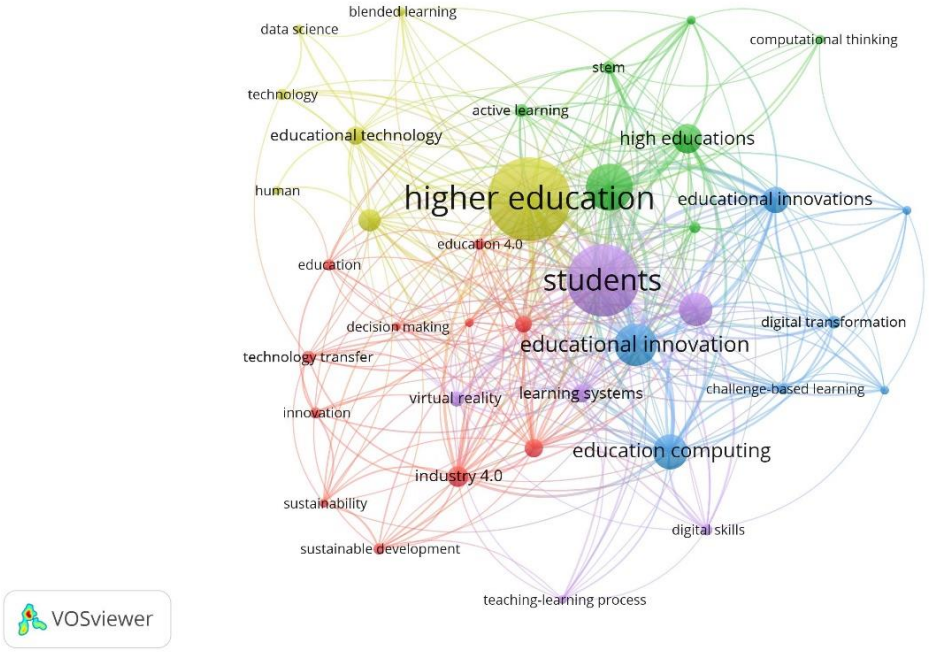

Figure 2. Co-occurrence of words

Source: Authors' own elaboration (2023); based on data provided by Scopus.

Higher Education was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Students are among the most frequently used variables, associated with variables such as Educational Innovation, Educational Information, Digital Transformation, Industry 4.0, Virtual Reality, and Educational Systems. From the above, it is striking, new technologies have provided students with essential digital skills that are increasingly in demand in the labor market. Mastering the use of various software, data analysis tools, and online platforms has become crucial for success in many fields. Students are now better equipped to navigate the digital landscape, critically evaluate information sources, and adapt to rapidly evolving technological advancements. In addition, technology has facilitated collaboration and communication between students and educators. Virtual classrooms, video conferencing, and online discussion forums have allowed students to connect with peers from different geographic locations, fostering cultural exchange and diverse perspectives. Collaborative platforms and cloud-based tools have also improved group work and project-based learning, preparing students for real-world professional environments

4.2 Distribution of scientific production by year of publication.

Figure 3 shows how scientific production is distributed according to the year of publication, taking into account that the period between 2017 and 2022 is taken

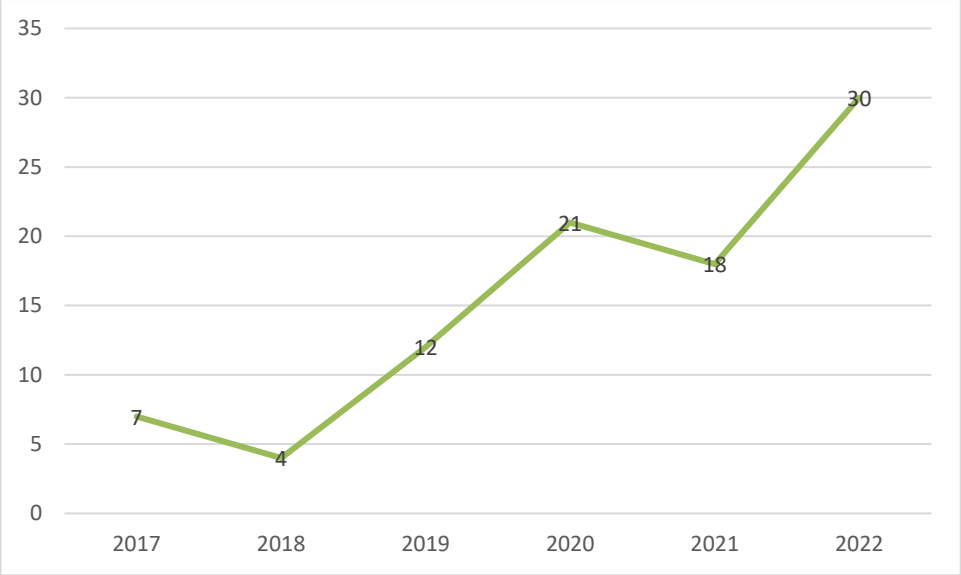

Figure 3. Distribution of scientific production by year of publication.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

Among the main characteristics evidenced through the distribution of scientific production by year of publication, the number of publications registered in Scopus was in 2022, reaching a total of 30 documents published in journals indexed on this platform. This can be explained thanks to articles such as the one entitled "Translating knowledge into innovation capacity: an exploratory study that investigates perceptions about distance education in higher education during the COVID-19 pandemic - the case of Mexico" This article presents a study on perceptions about the quality and efficiency of the educational process in higher education in distance education at the National Polytechnic Institute of Mexico during the COVID-19 pandemic. The data analysis identified the level of satisfaction with distance education separately for students and teachers and the lived experience for future educational models. The data analysis consisted of a stepwise regression model to identify the most important variables related to the satisfaction aspect of e-learning for students and teachers. The main findings are associated with the perception of one's own skills as the most crucial variable to define the aspects of satisfaction with e-learning. Therefore, these skills imply knowledge of e-learning platforms and the pace of adoption of new technologies. The study found that students emphasized that the variable "low sense of community" negatively impacts e-learning due to the loss of personal contact with the academic workspace. The key contribution of our research is the translation of knowledge into a model of sustainable innovation capacity.(Lytras, 2022)

4.3 Distribution of scientific production by country of origin.

Figure 4 shows how the scientific production is distributed according to the nationality of the authors.

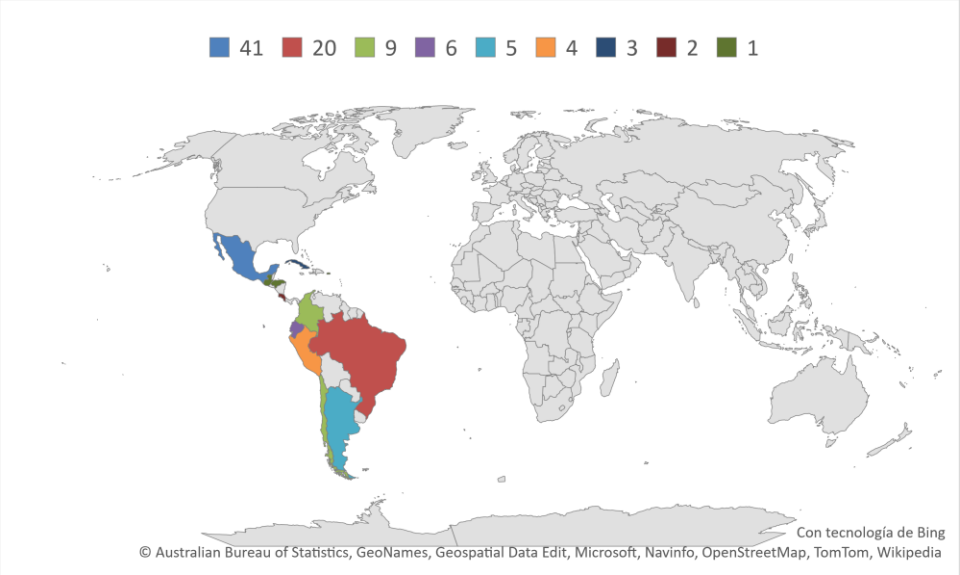

Figure 4. Distribution of scientific production by country of origin.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

Within the distribution of scientific production by country of origin, registrations from Latin American institutions were taken into account, establishing Mexico as the country of that community, with the highest number of publications indexed in Scopus during the period 2017-2022, with a total of 41 publications in total. In second place, Brazil with 20 scientific papers, and Colombia occupying the third place presenting to the scientific community, with a total of 9 documents among which is the article entitled "Current trends in the teaching of basic cardiopulmonary resuscitation." To characterize the impact of current trends in the teaching of cardiopulmonary resuscitation. Methods: A bibliographic review of scientific articles from the Medline, PubMed, SciELO Regional and SciELO Cuba databases was conducted. Spanish and English descriptors were used and 29 citations were reviewed. Results: Current trends involve the application of new technologies, self-training and the little development of face-to-face environments. Schools are considered key places for new forms of teaching. The simulators allow training under real clinical situations. Self-study ensures the consolidation of practical skills transmitted by the instructor and assimilated by the student. Conclusions: Cardiopulmonary resuscitation guarantees a better quality of life in the general population. Technological progress has opened a new stage in skills training, in which autonomy has prevailed; However, there are significant disadvantages. Therefore, there is a need for instructor-led counselling, offering basic theoretical and practical knowledge combined with a level of learning autonomy. This process must be monitored and controlled. While training doesn't stop there, systematic training anywhere allows you to reaffirm what you've learned. In this way, technological advances will make it possible to make the most of(Jiménez-Franco, 2022)

4.4 Distribution of scientific production by area of knowledge

Figure 5 shows how the production of scientific publications is distributed according to the area of knowledge through which the different research methodologies are executed.

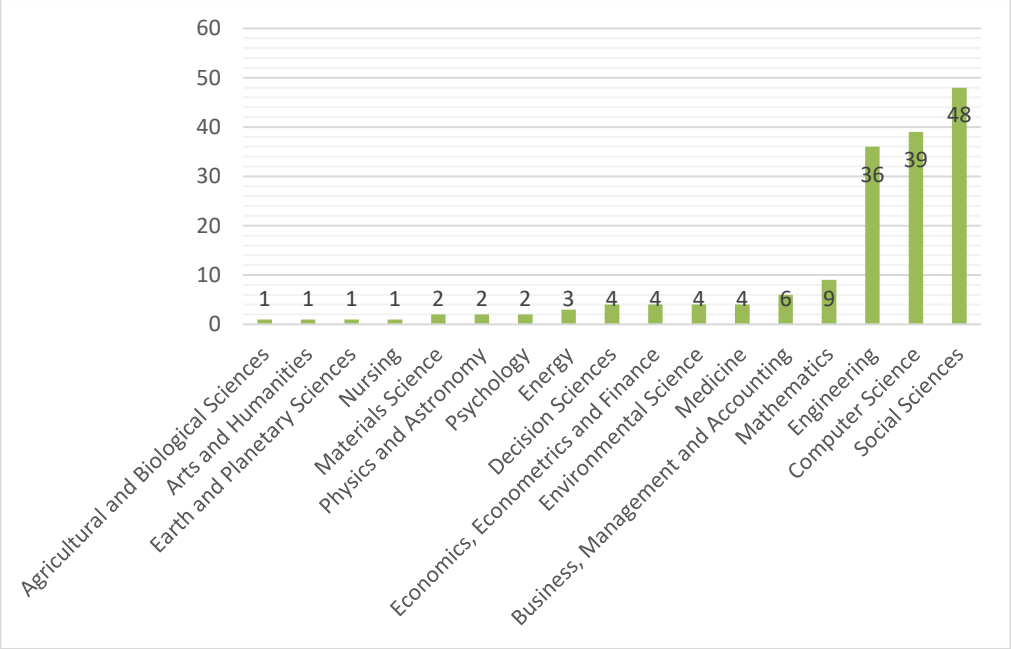

Figure 5. Distribution of scientific production by area of knowledge.

Source: Authors' own elaboration (2023); based on data provided by Scopus.

Social Sciences was the area of knowledge with the highest number of publications registered in Scopus, with a total of 48 documents based on their variable methodologies New Technologies, Student Competencies, Higher Education. In second place, Computer Science with 39 articles and Engineering in third place with 36. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by the area of Social Sciences entitled "Evaluation of a Virtual Campus Adapted to Web-Based Virtual Reality Spaces: Evaluations of Teachers and Students" This article analyzes the acceptance by teachers and students of a web-based virtual reality (WebVR) tool called Virtual Campus, Proposal to overcome the limitations of teaching strategies through the use of videoconferencing platforms. To measure the acceptance of the Virtual Campus, we designed an instrument based on the Technology Acceptance Model (TAM) that involves variables related to online contexts, the future perception of the use of the tool, the development of skills, and the appreciation and recommendation. The results indicate that participants favorably accepted WebVR technology as an alternative teaching methodology in emerging learning scenarios and intend to use it after the pandemic. The most highly rated elements were the interactions in the socialization spaces, the simulation of presence and the environmental dynamics. The main areas of opportunity for improvement were overcoming technical problems and improving the quality of the Internet connection; however, these did not affect the participants' recommendations. Future studies should incorporate variables related to the analysis of learning mediated by WebVR-based strategies and use different methodological designs to compare findings.(Rocha Estrada, 2022)

4.5 Type of publication

Figure 6 shows how the bibliography is distributed according to the type of publication chosen by the authors

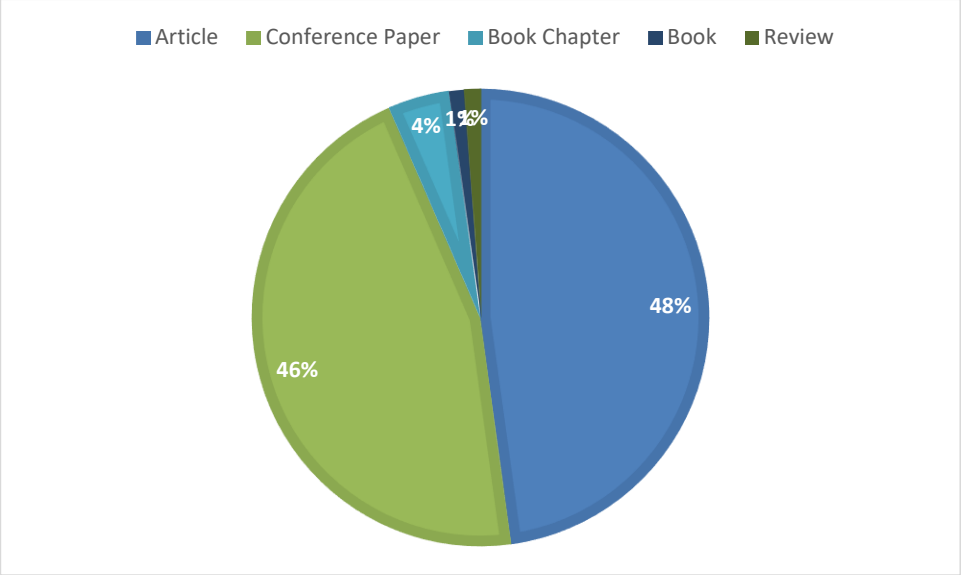

Figure 6. Publication Type

Source: Authors' own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was the one entitled Journal Articles with 48% of the total production identified for analysis, followed by Session Paper with 46%. Chapter of the book are part of this classification, representing 4% of the research papers published during the period 2017-2022, in journals indexed in Scopus. The aim of this paper is to evaluate the effectiveness of the "GOAL Project" platform (used to convey logistics concepts) by exploring students' opinion on the critical success factors of educational platforms and to determine how these elements influence motivation and skill development. such as student engagement, reflection on their learning, and self-directed learning.(Pacheco-Velazquez, 2022)

5. Conclusions

Through the bibliometric analysis carried out in this research work, it was possible to establish that Mexico was the country with the highest number of records published in the New Technologies, Student Competencies, Higher Education variables. with a total of 41 publications in the Scopus database. In the same way, it was possible to establish that the application of theories framed in the area of Social Sciences, were used more frequently in the implementation of new technologies in the competence of students in undergraduate training. These advances in higher education have transformed the way students have been taught and acquire new knowledge. The integration of these new technologies in the classrooms has had a positive impact on students' critical thinking, problem-solving and digital skills that are constantly changing, in the first instance, the accessibility and abundance of online resources have opened access to new information models for students, taking the information provided by educational books and texts further. These new advancements have fostered autonomous and independent learning, encouraging students to explore new perspectives. In addition, the interactive field of online education and the online learning platform have made learning more engaging and dynamic, resulting in great student performance and achieving higher knowledge retention. However, it is important to note that the impact of these new technologies on the academic competence of higher education students is not uniform across institutions and educators. Lack of access to these technologies and educational resources creates a level of inequality among students. It is vitally important for institutions to bridge the

digital inequality gap and ensure equitable and timely access to enhanced learning through technology.

In conclusion, the integration of new technologies in higher education has had a positive impact on students' competencies. These advancements have improved learning experiences, fostered collaboration, and developed essential digital skills. However, it is essential to address any disparities in access and digital literacy to ensure that all students can benefit from the potential of technology in education.

References

Jiménez-Franco, L. E.-P.-M. (2022). Current trends in the teaching of basic cardiopulmonary resuscitation. CUBA.

Lytras, M. D. (2022). Translating knowledge into innovation capacity: an exploratory study investigating perceptions about distance education in higher education during the COVID-19 pandemic - the case of Mexico. MEXICO.

Pacheco-Velázquez, E. (2022). Effects of the use of simulators and an online platform on logistics education. MEXICO.

Rocha Estrada, F. J.-R.-R.-M. (2022). Evaluation of a Virtual Campus Adapted to Web-Based Virtual Reality Spaces: Teacher and Student Evaluations. MEXICO.

Ali, A. (2020). Cloud computing adoption at higher educational institutions in the KSA for sustainable development. International Journal of Advanced Computer Science and Applications, 11(3), 413-419. Retrieved from www.scopus.com

Ang, K. L. -., Ge, F. L., & Seng, K. P. (2020). Big educational data analytics: Survey, architecture and challenges. IEEE Access, 8, 116392-116414. doi:10.1109/ACCESS.2020.2994561

Antonoaie, C., & Bucur, C. (2021). Considerations concerning ict specialists in europe. Paper presented at the ELearning and Software for Education Conference, 21-27. doi:10.12753/2066-026X-21-002 Retrieved from www.scopus.com

Astashova, N. A., Melnikov, S. L., Tonkikh, A. P., & Kamynin, V. L. (2020). Technological resources in modern higher education. [ТЕХНОЛОГИЧЕСКИЕ РЕСУРСЫ СОВРЕМЕННОГО ВЫСШЕГО ОБРАЗОВАНИЯ] Obrazovanie i Nauka, 22(6), 74-101. doi:10.17853/1994-5639-2020-6-74-101

Bagateeva, A., Ziganshina, C., Islamova, A., & Akhmetshina, A. (2021). The processes of informatization and digitalization in the linguistic education doi:10.1007/978-3-030-66093-2_24 Retrieved from www.scopus.com

Batanero, J. M. F., Rueda, M. M., Cerero, J. F., & García, S. A. (2022). Challenges and trends in the use of technology by hearing impaired students in higher education. Technology and Disability, 34(2), 101-111. doi:10.3233/TAD-220372

Bayonne-Oré, S. (2022). Student dropout in information and comunications technology careers. Paper presented at the Iberian Conference on Information Systems and Technologies, CISTI, , 2022-June doi:10.23919/CISTI54924.2022.9820074 Retrieved from www.scopus.com

Bere, A., & McKay, E. (2017). Investigating the impact of ICT tutorial strategies to promote improved database knowledge acquisition. Paper presented at the Proceedings of the 28th Australasian Conference on Information Systems, ACIS 2017, Retrieved from www.scopus.com

Bhattacharjee, D., & Mohanty, P. C. (2022). Do information differentials and confidence in medical institutions influence out-of-pocket expenditure on health care in india? Clinical Epidemiology and Global Health, 13 doi:10.1016/j.cegh.2021.100952

Bhuyan, D. J., & Borthakur, P. P. (2019). Effects of information and communication technology in social science research: Probability and usefulness. International Journal of Innovative Technology and Exploring Engineering, 8(8), 2724-2730. Retrieved from www.scopus.com

Brown Wilson, C., Slade, C., Wong, W. Y. A., & Peacock, A. (2020). Health care students experience of using digital technology in patient care: A scoping review of the literature. Nurse Education Today, 95 doi:10.1016/j.nedt.2020.104580

Burinskienė, A., & Seržantė, M. (2022). Digitalisation as the indicator of the evidence of sustainability in the european union. Sustainability (Switzerland), 14(14) doi:10.3390/su14148371

Caldevilla-Domínguez, D., Martínez-Sala, A. -., & Barrientos-Báez, A. (2021). Tourism and ICT. Bibliometric study on digital literacy in higher education. Education Sciences, 11(4) doi:10.3390/educsci11040172

Chiappe, A., & Lee, L. L. (2017). Open teaching: A new way on e-learning? Electronic Journal of e-Learning, 15(5), 369-383. Retrieved from www.scopus.com

Cisneros-Barahona, A., Marqués Molías, L., Samaniego Erazo, G., Uvidia-Fassler, M., de la Cruz-Fernández, G., & Castro-Ortiz, W. (2022). Teaching digital competence in higher education. A comprehensive scientific mapping analysis with rstudio doi:10.1007/978-3-031-18347-8_2 Retrieved from www.scopus.com

Cisneros-Barahona, A., Molías, L. M., Erazo, N. S., Fassler, M. U., Castro-Ortiz, W., & Rosas-Chávez, P. (2022). Digital competence of university teachers. an overview of the state of the art. [DIGITAL COMPETENCE OF UNIVERSITY TEACHING STAFF. An overview of the state of the art] Human Review.International Humanities Review, 11, 1-25. doi:10.37467/revhuman.v11.4355

Claros-Perdomo, D. -., Millán-Rojas, E. -., & Gallego-Torres, A. -. (2020). Use of augmented reality, gamification and M-learning. Faculty of Engineering Journal, 29(54) doi:10.19053/01211129.v29.n54.2020.12264

Colás-Bravo, P., Conde-Jiménez, J., & Reyes-De-cózar, S. (2021). Sustainability and digital teaching competence in higher education. Sustainability (Switzerland), 13(22) doi:10.3390/su132212354

Contreras, J. L. G., Torres, C. A. B., & Ojeda, Y. C. E. (2022). Using of ICT and LKT in higher education: A bibliometric analysis. [Use of ICT and TAC in Higher Education: A Bibliometric Analysis] Revista Complutense de Educación, 33(3), 601-613. doi:10.5209/rced.73922

Enescu, F. M., Bizon, N., & Ionescu, V. M. (2021). Blockchain technology protects diplomas against fraud. Paper presented at the Proceedings of the 13th International Conference on Electronics, Computers and Artificial Intelligence, ECAI 2021, doi:10.1109/ECAI52376.2021.9515107 Retrieved from www.scopus.com

Escorcia Guzmán, J., & Barros Arrieta, D. (2020). Knowledge management in higher education institutions: Characterization from a theoretical reflection. [Knowledge Management in Higher Education Institutions: Characterization from a Theoretical Reflection] Journal of Social Sciences, 26(3), 83-97. Retrieved from www.scopus.com

Farhangi, A., Yazdani, H., & Haghshenas, M. (2018). Identification of learning management systems functional areas and limitations (case study: E-learning center of university of tehran). Journal of Information Technology Management, 10(2), 331-354. doi:10.22059/jitm.2017.219238.1849

Farhangi, A., Yazdani, H., & Haghshenas, M. (2018). Identification of LMS dimensional problems in iranian E-learning centers. Paper presented at the 12th National and the 6th International Conference on e-Learning and e-Teaching, ICELET 2018, 33-44. doi:10.1109/ICELET.2018.8586751 Retrieved from www.scopus.com

Friedman, G. L. (2019). Cross-cultural promotional competence: A comparison of student and DMO marketing text. Journal of Teaching in Travel and Tourism, 19(3), 171-190. doi:10.1080/15313220.2018.1536529

Garcia, G. G., Lucena, F. J. H., Diaz, I. A., & Rodriguez, J. M. R. (2021). Productivity analysis around information literacy in the higher education stage. [Análise de produtividade em torno do letramento informacional no nível de ensino superior] Livre Text, 14(2) doi:10.35699/1983-3652.2021.33694

Garcia-Esteban, S., & Jahnke, S. (2020). Skills in european higher education mobility programmes: Outlining a conceptual framework. Higher Education, Skills and Work-Based Learning, 10(3), 519-539. doi:10.1108/HESWBL-09-2019-0111

Gavinolla, M. R., Swain, S. K., & Livina, A. (2021). Research contribution to the progress of digital learning in india doi:10.1007/978-981-16-1784-3_8 Retrieved from www.scopus.com

Ghabban, F., Selamat, A., Ibrahim, R., Krejcar, O., Maresova, P., & Herrera-Viedma, E. (2019). The influence of personal and organizational factors on researchers' attitudes towards sustainable research productivity in saudi universities. Sustainability (Switzerland), 11(17) doi:10.3390/su11174804

Gogo, K. O., Nderu, L., & Mwangi, R. W. (2018). Fuzzy logic based context aware recommender for smart E-learning content delivery. Paper presented at the 5th International Conference on Soft Computing and Machine Intelligence, ISCMI 2018, 114-118. doi:10.1109/ISCMI.2018.8703247 Retrieved from www.scopus.com

González-Zamar, M. -., Abad-Segura, E., López-Meneses, E., & Gómez-Galán, J. (2020). Managing ICT for sustainable education: Research analysis in the context of higher education. Sustainability (Switzerland), 12(19) doi:10.3390/su12198254

Grande-De-Prado, M., Cañón-Rodríguez, R., García-Martín, S., & Cantón-Mayo, I. (2021). Creation of digital contents in primary teachers in training. [Digital Content Creation in Future Primary School Teachers] Faculty, 25(3), 331-347. doi:10.30827/FACULTY. V25I3.8377

Guillén-Gámez, F. D., Ruiz-Palmero, J., Sánchez-Rivas, E., & Colomo-Magaña, E. (2020). ICT resources for research: An ANOVA analysis on the digital research skills of higher education teachers comparing the areas of knowledge within each gender. Education and Information Technologies, 25(5), 4575-4589. doi:10.1007/s10639-020-10176-6

Gün, A., Demir, Y., & Pak, B. (2020). Urban design empowerment through ICT-based platforms in europe. International Journal of Urban Sciences, 24(2), 189-215. doi:10.1080/12265934.2019.1604250

Hairi, F., Mohamad, S. N. M., Saad, S., & Pinandita, T. (2022). A THEMATIC REVIEW ON THE IMPLEMENTATION OF HEUTAGOGY IN UNIVERSITIES. Journal of Theoretical and Applied Information Technology, 100(21), 6686-6701. Retrieved from www.scopus.com

Hu, J., & Hu, J. (2022). Teachers' frequency of ICT use in providing sustainable opportunity to learn: Mediation analysis using a reading database. Sustainability (Switzerland), 14(23) doi:10.3390/su142315998

Huang, H., & Hwang, G. -. (2021). Advancement and research issues of ICT-based training for newly graduated nurses: A review of journal publications from 1985 to 2017. Interactive Learning Environments, 29(1), 164-178. doi:10.1080/10494820.2018.1559865

Hussain, M., Idrees, D. H., Faqir, D. K., & Haider, M. S. (2021). Assessment of ICT facilities in the public libraries of khyber pakhtunkhwa: A descriptive study. Library Philosophy and Practice, 2021, 1-23. Retrieved from www.scopus.com

Idris, I., Fajrillah, Novarika Ak, W., Hastalona, D., Syarifudin Yahya, A., & Marikena, N. (2020). Designing of integrated information system (IIS) scheme for private higher education in indonesia: A strategic plan. Paper presented at the IOP Conference Series: Materials Science and Engineering, , 1003(1) doi:10.1088/1757-899X/1003/1/012151 Retrieved from www.scopus.com

Jácome-Ortega, A. E., Herrera-Granda, E. P., Herrera-Granda, I. D., Caraguay-Procel, J. A., Basantes-Andrade, A. V., & Ortega-Bustamante, M. C. (2019). Algorithm customization to audit database in higher education institutions. [Temporal analysis and prognosis of the use of ICTs, based on the teaching evaluation instrument of a higher education institution] RISTI - Iberian Journal of Information Systems and Technologies, 2019(E22), 399-412. Retrieved from www.scopus.com

Jony, S. S. R., Kano, T., Hayashi, R., Matsuda, N., & Rahman, M. S. (2022). An exploratory study of online job portal data of the ICT sector in bangladesh: Analysis, recommendations and

preliminary implications for ICT curriculum reform. Education Sciences, 12(7) doi:10.3390/educsci12070423

Karamali, M., Yaghoubi, M., & Parandeh, A. (2021). Scientific mapping of papers related to health literacy using co-word analysis in medline. Iranian Journal of Health Education and Health Promotion, 9(3), 280-295. doi:10.52547/ijhehp.9.3.280

Khlaisang, J., & Koraneekij, P. (2019). Open online assessment management system platform and instrument to enhance the information, media, and ICT literacy skills of 21st century learners. International Journal of Emerging Technologies in Learning, 14(7), 111-127. doi:10.3991/ijet.v14i07.9953

Lima, A. A., Provenza, M. M., & Nunes, M. A. S. N. (2022). Comics as a pedagogical tool for teaching. Paper presented at the 2022 17th Latin American Conference on Learning Technologies, LACLO 2022, doi:10.1109/LACLO56648.2022.10013316 Retrieved from www.scopus.com