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DIGITAL EMPOWERMENT AND INNOVATION FOR TRANSFORMATION IN UNIVERSITIES 4.0

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Abstract

A systematic review was carried out on the production and publication of research papers related to the study of Digital Empowerment, Innovation and Higher Education under the PRISMA approach (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The purpose of the analysis proposed in this document was to know the main characteristics of the publications registered in the Scopus and WoS databases during the year and their scope in the study of the proposed variables, achieving the identification of 32 publications in total. Thanks to this first identification, it was possible to refine the results through the keywords entered in the search button of both platforms, which were DIGITAL EMPOWERMENT and INNOVATION and HIGHER EDUCATION, reaching a total of 14 documents, already excluding duplicates and those that did not meet the analysis criteria. The scientific publications identified were analyzed in the hope of finding out the relationship between the variables, as well as the application of digital strategies within academic training and the inclusion of new technologies in universities.

Keywords: Digital Empowerment, Innovation, University 4.0

1. Introduction

There are many educational institutions worldwide that offer Online Education or Virtual Education as an alternative in the formative processes, according to variables such as personal preferences, accessibility, coverage, and socioeconomic and family factors, which are determinants at the moment of choosing, the part of the student, which type of modality adjusts to his needs, whether it is face-to-face, virtual, remote (synchronous-asynchronous), among others. For students to receive a quality education in any of the modalities and consistent with the current reality, a series of conditions must be combined, among which is an aspect of great importance such as Digital Teaching Competences that lie in the skills that a teacher has to implement training strategies based on the use of Information and Communication Technologies (ICT) and that can be enhanced thanks to continuous training by the institutions and educational management (Bustos & Gómez, 2018). This allows both teachers and institutions to maintain a high degree of updating processes based on tools designed to support the teaching-learning processes.

ICT can be of great help for universal access to knowledge, deriving in aspects such as equity, professional development and economic growth (Venkatesh *et al*., 2014). Therefore, Digital

Empowerment is part of a new institutional value that is based on the knowledge of the usefulness and applicability of digital strategies in academic training, hence the importance of continuous education and constant training among the faculty of universities to apply the whole set of digital strategies adopted by the institutions, resulting in the efficient and controlled management of technological resources as part of an educational system designed to meet the needs of students. Such empowerment begins by strengthening the digital competencies of teachers through strategies such as the evaluation of virtual training processes, feedback and self-evaluation, and allows for enhancing the aspects that strengthen the confidence, security and knowledge of teachers in the use of technological tools to support their teaching methodologies, which lies in personal motivation and satisfaction with the work tools, in this case, those designed to enable academic training through programs and digital devices (Artavia & Castro, 2019).

The above is a topic of great relevance in the study of Digital Empowerment and how the inclusion of technological resources has contributed to the transformation of the educational system in universities, so it is expected that through the development of this article, the contribution of researchers to the construction of digital strategies in university education can be established.

2. General objective

To analyze from a bibliographic perspective, the production of high-impact research papers indexed in WoS and Scopus databases, on the variables Digital Empowerment, Innovation and Higher Education, based on the PRISMA methodology.

3. Methodology

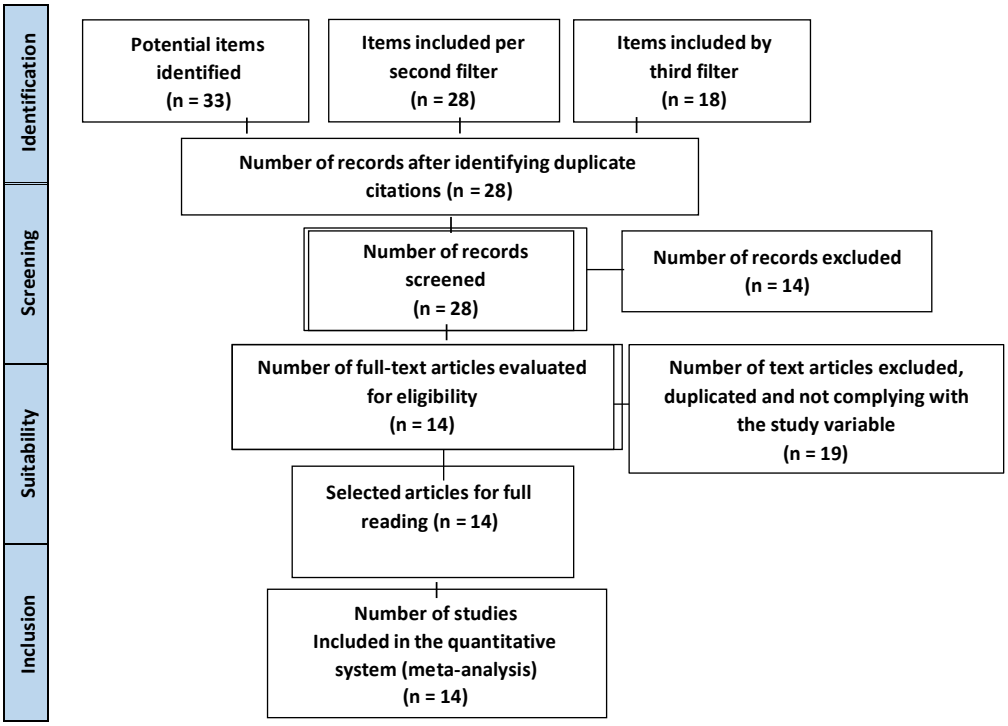
The present research is of qualitative type, according to Hernández *et al*. (2015), qualitative approaches correspond to researches that perform the procedure of obtaining information to review and interpret the results obtained in such studies; for this, it searched for information in the Scopus and WoS databases using the words DIGITAL EMPOWERMENT and INNOVATION and HIGHER EDUCATION.

3.1 Research design

The research design proposed for the present research was the Systematic Review which involves a set of guidelines to carry out the analysis of the data collected, which are framed in a process that began with the codification until the visualization of theories (Strauss & Corbin, 2016). On the other hand, it is stated that the text corresponds to a descriptive narrative in that it is intended to find out how the levels of the variable affect it. It is also systematic because after reviewing the academic material obtained from scientific journals, the theories on knowledge management were analyzed and interpreted (Hernández, Baptista, & Fernández, 2015).

The results of this search are processed as shown in Figure 1, which expresses the PRISMA technique for the identification of documentary analysis material.

Figure 1. Flowchart of systematic review performed under PRISMA technique.



Source: Own elaboration; Based on the proposal of the Prisma Group (Moher *et al*., 2009).

4. Results

Table 3 shows the results after applying the search filters related to the methodology proposed for this research, after recognizing the relevance of each of the referenced studies.

Table 1. List of analyzed articles

N°	TITLE OF THE RESEARCH	AUTHOR/YEAR	COUNTRY	TYPE OF STUDY	INDEXING
1	*Digital solutions to facilitate education, training and professional support for pediatric oncology and other health professionals in rural and other low-resource settings*	Martiniuk, A., Challinor, J., Arora, R. S., Handayani, S. A., & Lam, C. (2021).	AUSTRALIA, USA, INDIA, INDONESIA	QUALITATIVE	SCOPUS

2	*Teacher development potential (Creativity and innovation) education management in engineering training, coaching and writing works through scientific knowledge intensive knowledge based on web research in the industrial revolution and society*	Rosa, A. T. R. (2020).	CANADA	QUANTITATIVE	SCOPUS
3	*Resignification of educational e-innovation to enhance opportunities for graduate employability in the context of new university degrees*	Valds, R. T., & Santa Soriano, A. (2018).	SPAIN	QUALITATIVE	SCOPUS
4	*The oxford handbook of technology and music education (Book)*	Ruthmann, A., & Mantie, R. (Eds.). (2017).	USA	QUALITATIVE / QUANTITATIVE	SCOPUS
5	*Transmedia narratives with young university students: Digital ethnography in the hyperconnected society*	Gutierrez Pequeno, J. M., Fernandez Rodriguez, E., & de la Iglesia Atienza, L. (2017).	SPAIN	QUANTITATIVE	SCOPUS
6	*Digital empowerment in Ecuador through its infocenters*	Martinez Cardama, S., & Caridad Sebastian, M. (2019).	SPAIN	QUANTITATIVE	WOS

7	*Higher education students' experiences of digital learning and (dis) empowerment*	Costa, C., Murphy, M., Pereira, A. L., & Taylor, Y. (2018)	AUSTRALIA	QUALITATIVE	WOS
8	*The research observatory on the massive online open courses: MOOCSERVATORIO (R)*	Martin Padilla, A. H., Lopez Meneses, E., Bernal Bravo, C., & Vazquez Cano, E. (2018).	SPAIN	QUANTITATIVE	WOS
9	*Self-expressive creativity in the adolescent digital domain: Personality, self-esteem, and emotions.*	Pérez-Fuentes, M. D. C., Molero Jurado, M. D. M., Gázquez Linares, J. J., Oropesa Ruiz, N. F., Simón Márquez, M. D. M., & Saracostti, M. (2019).	SPAIN, PARAGUAY, CHILE	QUANTITATIVE	WOS
10	*The quality of assessment tasks as a determinant of learning*	Ibarra-Sáiz, M. S., Rodríguez-Gómez, G., & Boud, D. (2021).	SPAIN, UNITED KINGDOM	QUANTITATIVE	WOS
11	*Design and impact evaluation of a digital reproductive health program in Rwanda using a cluster randomized design: study protocol*	Nolan, C., Packel, L., Hope, R., Levine, J., Baringer, L., Gatare, E., ... & McCoy, S. (2020).	USA, RWANDA	QUALITATIVE	WOS
12	*Leveraging mobile phones to attain sustainable development*	Rotondi, V., Kashyap, R., Pesando, L. M., Spinelli, S., & Billari, F. C. (2020).	USA	QUANTITATIVE	WOS

13	*The U&I study: study protocol for a feasibility randomised controlled trial of a pre-cognitive behavioural therapy digital 'informed choice' intervention to improve attitudes towards uptake and implementation of CBT for psychosis*	Greenwood, K., Alford, K., O'Leary, I., Peters, E., Hardy, A., Cavanagh, K., ... & Garety, P. (2018)	UNITED KINGDOM	QUALITATIVE	WOS
14	*The Spanish online program Educar en Positivo (The Positive Parent): Whom does it benefit the most?*	Suárez, A., Rodríguez, J. A., & Rodrigo, M. J. (2016).	SPAIN	QUALITATIVE	WOS

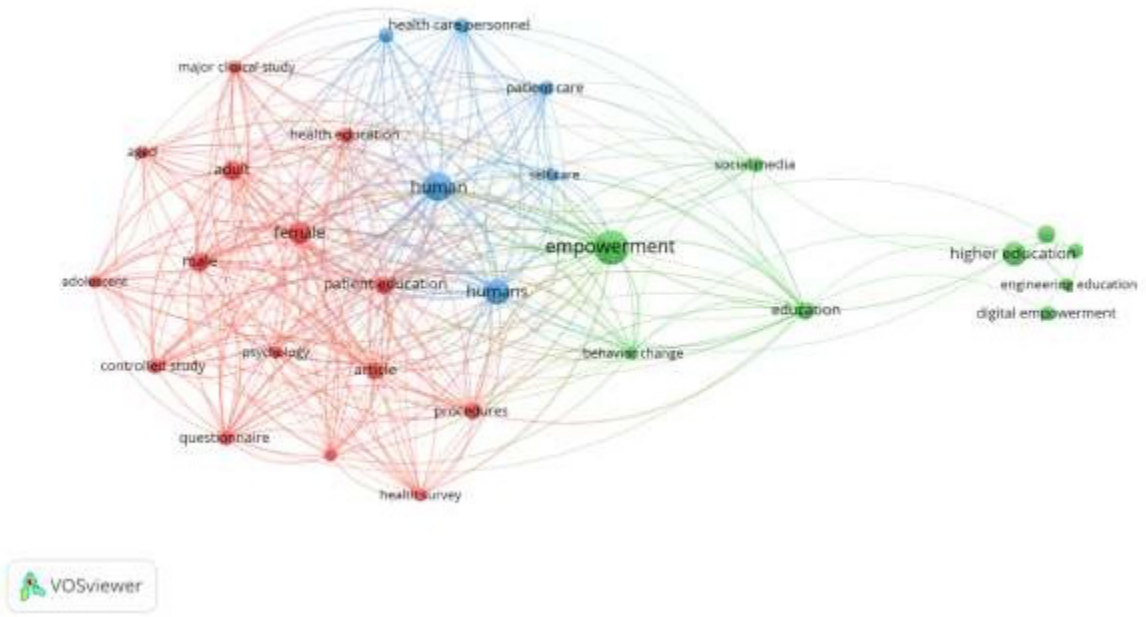
Source: Own elaboration

The 14 documents listed in the table above correspond, as mentioned above, to the search performed in the Scopus and Wos databases, without discriminating by country of origin of the publication or area of knowledge. It is important to note that before the preparation of Table 1, arguments of competence and relevance were taken into account for the subsequent individual analysis of each text.

4.1 Co-occurrence of words

Figure 2 shows the relationship between the keywords used for the search of the study material for the elaboration of the systematic analysis proposed for this research.

Figure 1. Keyword co-occurrence.



Source: Own elaboration

The word Empowerment has been the central axis of the research identified and related in Table 1, associated with research in the area of Education, Virtual Education, Social Networks, Higher Education, and Digital Empowerment. This allows inferring that the term Empowerment is closely related to the ability to develop digital skills and competencies within professional training, thanks to the use of technological advances in the service of education. On the other hand, there is evidence of evaluation mechanisms for teaching-learning processes that prove to be an important tool in measuring the quality imparted through ICTs, such as self-evaluation, applied questionnaires, and control studies, among others. This makes it possible to exercise vigilance in the process of adaptation to the use of virtual platforms and programs used in professional training.

The information gathering mechanisms allow knowing the current state of the educational quality not only in traditional areas since they are applied to know the effectiveness in the implementation of strategies based on the use of technological resources, as well as to know aspects to improve and identify strengths to potentiate within the transformation process in the universities. It is important to highlight a marked trend at present, and that is the popularization of Hybrid Education involving face-to-face and virtual strategies, which has taken more strength as a result of the health crisis that began in late 2019 with the declaration of a pandemic by the World Health Organization (WHO) because of COVID-19 originated in China and quickly invaded countries on all continents, forcing States to declare mandatory quarantine to curb the accelerated number of contagions and deaths from the same disease. This caused a high degree of social uncertainty (Inter-American Development Bank, 2020). The educational sector was even forced to virtualize the academic contents to give continuity to the training processes.

Within the framework of the COVID-19 pandemic, educational institutions discovered a high potential in the use of platforms designed for educational purposes, to such an extent that they are already beginning to offer not only face-to-face and virtual programs, but also hybrid programs, which involve a part of the two initial methodologies. In other words, students can access their classes remotely, synchronously or

asynchronously, and also attend in person in a safe environment for the preservation of health, respecting the biosecurity measures established to avoid contagion.

4.2 Discussion

The purpose of this article was to analyze from a systematic perspective, the contribution of the authors through their publications, to the study of Digital Empowerment and Innovation for transformation in universities 4.0. In this way, it is possible to affirm that the researchers indicated in the body of this document, have carried out research at different levels whose findings contribute to the generation of new knowledge regarding the variables proposed for the present study, this is how great contributions are identified as contemplated in the article entitled "Digital solutions to facilitate education, training and professional support for pediatric oncology and other health professionals in rural and low-resource settings" (Martiniuk *et al*., 2021), whose purpose was to identify digital resources that support the training and development of the pediatric oncology workforce in low-resource settings. The study was able to determine that digital solutions have a valuable role in increasing the knowledge, skills and empowerment of healthcare professionals to diagnose, treat and care for children and adolescents with cancer, thus demonstrating that ICT support for professional training. It is possible to recreate scenarios through tools such as virtual reality, which have allowed to strengthen competencies in terms of diagnosis and treatment in health conditions such as the one mentioned above, therefore the use of technologies in training, in this case of health professionals, is of great help, contrary to what has been traditionally thought.

The above allows inferring that future professionals have the necessary tools and knowledge to exercise their degrees successfully, as presented in the article "Resignification of educational e-innovation to enhance the employability opportunities of graduates in the context of new university careers" (Valds & Santa Soriano, 2018) whose objective was to present the results of a training program based on an Action Research methodology that has been applied in two subjects of the degrees and masters in Event Organization, Protocol and Institutional Relations. The program seeks to promote the understanding and internalization of the potential that exists through technology in their training processes by building their brand as a key to digital literacy and professional empowerment. Firstly, it seeks to identify the work of the teacher supported by technological resources, highlighting innovation within the teaching-learning process, which translates into the adherence of students to the use of technological resources, which positively impacts their performance as professionals since they would be familiar with current technological advances in the exercise of their functions as graduates in any area of knowledge.

Similarly, it was possible to measure the perception of students who have faced changes in learning methodology, as explained in the article entitled "Digital learning experiences and (dis)empowerment of higher education students" (Costa *et al*., 2018) which focuses on learning practices in higher education about digital participatory culture. The study sought to measure the active participation in the website by students through programs associated with their lines of training, as complementary tasks to their studies, however, it was identified that although students are competent users of the website, participation in it was very low demonstrating little adherence to the program. The researchers determined that the students' perception of the Web is not only as a space for student participation but also as a space for surveillance, which leads them to ignore a large percentage of the strategies designed for digital participation.

5. Conclusion

This review article concludes by highlighting the importance of knowing the updated state of the literature published in databases such as Scopus or WoS, concerning the study of Digital Empowerment and Innovation for transformation in universities, since this allows consolidating a theoretical basis of great relevance in the search for the generation of new knowledge that allows finding new and better strategies to promote the

inclusion of technological tools in the training of professionals. The authors cited here have agreed on the effectiveness of digital tools for academic training at all levels of education.

It is important to highlight the usefulness of ICTs in support of the teaching-learning process, and how they can enhance traditional methodologies. However, within the evaluation of the quality perceived in virtual or hybrid education, it is necessary to know the digital competencies of teachers, as one of the determining aspects in the use of technologies in the service of education, since the security and confidence perceived by students concerning their trainers, encourages interest in the use of tools designed to complement their training. It is important to highlight the role that ICTs have played in recent times, in the midst of a major global health crisis, and how, thanks to the virtualization of academic content, it was possible to continue professional training despite the impossibility of attending educational institutions in person as a result of the measures imposed to restrict mobility and crowds through mandatory quarantines to reduce the number of infections and deaths caused by the COVID-19 virus. Once this crisis was overcome, at least in a high percentage, some universities decided to continue with a hybrid modality, which combines face-to-face sessions with virtual sessions, based on the finding that the university dropout rate decreased, the adherence to academic programs increased, as well as the possibility of increasing coverage in education, which is a very important objective in the state agenda.

All these changes that have been experienced at the educational level, have strengthened the strategies implemented to include more and more successfully, technological tools that support university education, for this reason, knowing the actuality of these contributions is of great help in the construction of new knowledge in this regard, hence the importance of studies such as the one consigned in this document, which hopefully will become a theoretical basis for researchers seeking new and better alternatives in the implementation of digital methodologies to vocational training.

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