Analysis Of The Development Of Educational Competencies According To Teaching Methods

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Abstract

A systematic review was carried out on the production and publication of research papers on the study of Educational Competencies according to Teaching Modalities, under the PRISMA approach (Preferred Reporting Items for Systematic reviews and Meta-Analyses). The purpose of the analysis proposed in the present 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 202 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 EDUCATIONAL COMPETENCIES and TEACHING MODALITIES, reaching a total of 16 documents, already excluding duplicates and those that did not meet the analysis criteria. The identified scientific publications were analyzed in the hope of finding out the relationship between the variables, as well as the development of teaching methodologies based on the competencies developed through academic training.

Keywords: Educational Competencies, Teaching Modalities

1. Introduction

The term Competence refers to "an underlying characteristic in a person that is causally related to performance, relative to a superior or effective criterion, in a job or situation" (SPENCER & SPENCER, 1993).
causally related to performance, referred to a superior or effective criterion, in a job or situation" (SPENCER & SPENCER, 1993), that is, the set of potential behaviors that are adapted to a specific situation. These behaviors are defined by aspects inherent to the individual, such as motivation, personality traits, self-concept, knowledge and skills. It is important to emphasize that the first three aspects mentioned above, obey only and exclusively to the human component, to the inner being that is individualized by personal characteristics, while the last two, knowledge and skills, are evidenced in the performance of people in areas such as education through the manifestations of the teaching-learning process. Therefore, it can be assured that competencies include the capacity of students to face the different situations to which they are exposed within their academic training, focusing the concept of Competency clearly

on school preparation at its different levels. The development of educational competencies involves a series of events and processes designed by educational institutions to enhance the strengths of students and reduce their weaknesses so that they develop an efficient performance both inside and outside the classroom. It is important to highlight that competencies have components and subcomponents that determine their applicability to the environment (Table 1).

COMPONENTS	SUBCOMPONENTS
1. Knowledge The systematic acquisition of knowledge, classifications, theories, etc. Related to scientific subjects or professional professional area.	1.1 General for learning
	1.2 Academic related to a subject area
	1.3 Linked to the professional world
2. Skills and Abilities training in applied methodological procedures related to scientific subjects or professional areas (organize, apply, manipulate (Organize, apply, manipulate, design, plan, carry out...).	2.1 Intellectual
	2.2 Communication
	2.3 Interpersonal
	2.4 Personal organization/management
3. Actitudes and Values Attitudes and values necessary for professional practice: responsibility, autonomy, the initiative in complex situations, coordination, etc. complex situations, coordination, etc. ...	3.1 Professional development
	3.2 Personal commitment

Table 1. Components and subcomponents of a competency
Source: (de Miguel Díaz, 2005)

Because of the above, different teaching modalities have been proposed to meet the needs identified in the diversity of the student population, understanding that the learning process may vary from one person to another depending on the level of competencies required to take advantage of the acquisition of new knowledge. Therefore, it is of great importance to establish which are the most frequently used modalities and what kind of competencies are sought to be developed through their application, so this review has been proposed to synthesize the position of different authors on this topic, hoping to build an important bibliographic resource that constitutes a theoretical basis to support the

generation of new theories on the development of educational competencies according to the teaching modalities.

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 Educational Competencies Development and Teaching Modalities, 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 EDUCATIONAL COMPETENCIES and TEACHING MODALITIES.

3.1 Research design

The research design proposed for this 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 affirmed that the text corresponds to a descriptive narrative because it intends to find out how the levels of the variable affect; and 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, utilizing which the PRISMA technique for the identification of documentary analysis material is expressed. It was taken into account that the publication was published during the period between 2017 and 2021 by authors affiliated with Latin American institutions.
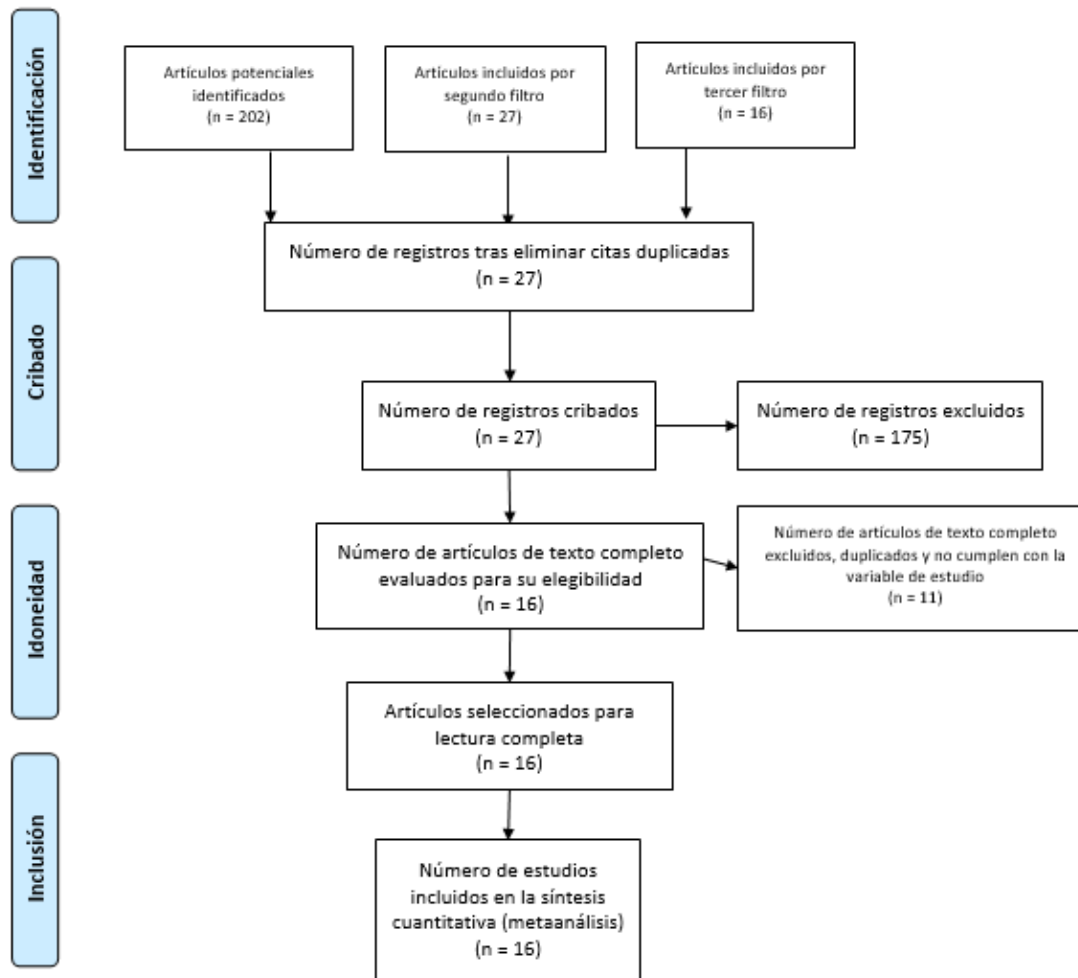
Figure 1. Flowchart of systematic review performed under PRISMA technique (Moher, Liberati, Tetzlaff, Altman, & Group, 2009)
Source: Own elaboration; Based on the proposal of the Prisma Group (Moher, Liberati, Tetzlaff, Altman, & Group, 2009)

4. Results

Table 2 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 works.

No.	TITLE OF THE RESEARCH	AUTHOR/YEAR	COUNTRY	TYPE OF STUDY	INDIZATION
1	Youtube videos in the virtual flipped classroom model using brain signals	Sangermán Jiménez, M. A., Ponce, P., & Vázquez-Cano, E. (2021)	MEXICO, SPAIN	QUALITATIVE	SCOPUS

	and facial expressions			
2	Professors' Concerns after the Shift from Face-to-face to Online Teaching amid COVID-19 Contingency: An Educational Data Mining analysis	De Oca, S. M., Villada-Balbuena, M., & Camacho-Zuñiga, C. (2021, December).	MEXICO	QUANTITATIVE	SCOPUS
3	Gamification during Covid-19: Promoting active learning and motivation in higher education	Rincon-Flores, E. G., & Santos-Guevara, B. N. (2021).	MEXICO	QUALITATIVE	SCOPUS
4	Teacher's Digital Competencies. A Systematic Review in the Latin-American Context	Vásquez, M. S., Roig-Vila, R., & Peñafiel, M. (2021)	BRAZIL	QUALITATIVE / QUANTITATIVE	SCOPUS
5	Analysis of Colombia's Saber Pro results 2019 for natural science and environmental teachers training: Reflections and challenges in higher education based in competences	León, C. A. A., Moreno-Gómez, E., & García-Noguera, L. J. C. (2020)	COLOMBIA	QUANTITATIVE	SCOPUS
6	Digital competences relationship between gender and generation of university professors	Basantes-Andrade, A., Cabezas-González, M., & Casillas-Martín, S. (2020).	ECUADOR, SPAIN	QUALITATIVE	SCOPUS

7	Improving creative thinking in engineering students through ART appreciation	Caratozzolo, P., Álvarez-Delgado, A., & Hosseini, S. (2019, June).	MEXICO	QUALITATIVE	SCOPUS
8	Professors' self-assessment techno-pedagogical skills in the development of educational resources for a virtual modality	Howlet, L.C.P., Aguilar, A.L.S., Del Carmen Gutiérrez Diez, M. (2019)	MEXICO	QUANTITATIVE	SCOPUS
9	Constructing an instrument with behavioral scales to assess teaching quality in blended learning modalities	Matosas-López, L., Aguado-Franco, J., & Gómez-Galán, J. (2019).	PUERTO RICO, SPAIN	QUANTITATIVE	SCOPUS
10	DIGITAL COMPETENCIES FOR PLA AND PLAC TEACHERS: A PATH WITH NO SHORTCUTS OR RETURNS	Marqués, ALD; Wojciechowski, T (2021)	CHILE, BRASIL.	QUANTITATIVE	WOS
11	Analysis of the methodological process in higher education programs in virtual modality	Diaz-Guillen, PA; Andrade-Arango, Y; Hincapié-Zuleta, AM, Uribe-Uran, AP	COLOMBIA	QUALITATIVE	WOS

12	The case study as teaching method and research modality for the titulation work	Marzo Vanegas, S. L., & Herreria Vanegas, S. G. (2017).	ECUADOR	QUANTITATIVE	WOS
13	Teaching competences in virtual environments: a model for their evaluation	Garcia-Cabrero, B., Luna Serrano, E., Ponce Ceballos, S., Cisneros-Cohernour, E. J., Cordero Arroyo, G., Espinosa Diaz, Y., & Garcia Vigil, M. H. (2018).	MEXICO	QUALITATIVE	WOS
14	Educational implications of reading habits in the academic behavior of the university students to distance	Arguedas-Ramirez, L (2020)	COSTA RICA	QUALITATIVE	WOS
15	Teacher Training´s Needs in University Context: A Case Study of a Chilean University of Applied Sciences	Gormaz-Lobos, D., Galarce-Miranda, C., Hortsch, H., & Vargas-Almonacid, C. (2021).	CHILE	QUALITATIVE	WOS
16	Documentary analysis related to continuing education as the integrating axis of the competences of the university curriculum	Rivera, LDF; Tamayo, CFM and Amaguaya, MM (2021)	ECUADOR	QUANTITATIVE	WOS

Table 2. List of analyzed articles
Source: Own elaboration

The 16 documents listed in the above table correspond, as mentioned above, to the search performed in the Scopus and WoS databases, limited to Latin American countries, without distinction of area of knowledge. It is important to emphasize that before the elaboration 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 2. Keyword co-occurrence.
Source: Own elaboration

The word Humans has been, within the research identified, the most frequently used in the development of the different methodologies. The components inherent to the natural conditions of the human being, such as abilities and skills, physical and mental conditions, preparation and professional training, are part of most of the studies referenced in Table 2. This variable has been related to studies published on Teaching Modalities, Students, Methodologies, Information Processing, Feedback systems,

and and Pedagogy, among others, which allow inferring that the authors have been able to relate the different methods to support the teaching-learning process with the conditions of each individual, as an initial strategy in the search for the use in the construction and generation of new knowledge.

On the other hand, there is evidence of a set of research grouped around the area of medicine, and how competency-based training has been effective in the training of health professionals. Keywords such as Medical Education, Resident Education, Clinical Practice, Patient Simulation, and Virtual Reality, are part of the most frequently

investigated variables and allow inferring that within the training of professionals in this area, it has been seeking to enhance learning through different methodologies designed from the needs of students, with great support in technologies that allow evaluating how much they apply the knowledge acquired in classes and the possibility of identifying strengths and weaknesses through feedback after each exercise practiced by these means.

The above contributes to the development of educational competencies, as it has been a subject that has been investigated in greater depth since the application of technological tools to pedagogical strategies in educational institutions at different levels of training, especially in higher education, as it offers students the possibility of applying the knowledge acquired for the development of their professions, from programs or simulated environments through technology to enhance the competencies developed through each teaching modality.

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 the development of Educational Competencies according to the Teaching Modalities. In this way, it is possible to affirm that the investigations 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 "Self-assessment of techno pedagogical competencies of teachers in the development of educational resources for a virtual modality" (Howlet et al., 2019), whose purpose was to make a diagnosis of the techno-pedagogical competencies of teachers for the

development of teaching materials for the virtual modality, understanding the current trend of educational institutions to promote this teaching modality that has allowed, on the one hand, to expand coverage in education, as one of the functions of the State as guarantor of the fulfillment of the Fundamental Rights, to comply with the pedagogical objectives in the technological era, and to meet the needs of the student community ensuring a good performance as professionals by keeping updated the knowledge in each area of knowledge and of course in the use of technological tools for the exercise of their functions.

It is important to note that the study focused its efforts on the digital competencies of teachers. For this purpose, the researchers designed a questionnaire applied to 56 teachers of the School of Accounting and Administration of the Autonomous University of Chihuahua, Mexico, revealing that they lack the skills required for the development of teaching materials for the virtual mode. This is a great opportunity for improvement on the part of educational management since it is necessary to have highly trained teachers in this type of modality so that students can fully develop their competencies in the use of technologies for the execution of tasks related to the application of their knowledge as professionals.

It is important to highlight that, currently, education has gone through a difficult situation due to the global health crisis, after the declaration of a pandemic due to the rapid transmission of the COVID-19 virus that originated in China at the end of 2019, so the virtualization of academic content, turned out to be the main support methodology to give continuity to the training processes. This has been contemplated in articles such as the one entitled "Teachers' concerns after the change

from face-to-face to online teaching amid the COVID-19 contingency: an educational data mining analysis" (De Oca et al., 2021), whose objective was to identify teachers' concerns after the move to distance education and the first 15 months of confinement.

The analysis material was collected through social networks from more than 5,700 teachers at a private Mexican university that implemented online teaching. Among the main findings, it was found that teachers have expressed the need to provide continuous training to professors in communication and learning management platforms to participate in ongoing discussions on issues such as whether turning on the cameras should be mandatory during online lectures. Another article that sought to learn about the implications of methodological change thanks to the pandemic of COVID-19 was entitled "Gamification during Covid-19: Fostering active learning and motivation in higher education" (Rincon-Flores & Santos-Guevara, 2021), which found through the fulfillment of its objective that the virtual teaching modalities urgently implemented during the Covid-19 pandemic require strategies to motivate students to actively participate in higher education. The authors determined that gamification favors the relationship between attention, participation and performance while favoring the humanization of virtual environments created during academic confinement.

Therefore, it is necessary to affirm that the global trend toward the incorporation of new Information and Communication Technologies (ICTs) is necessary as long as there are teachers whose digital competencies are related to the current situation, the availability of resources of both educational institutions and each family nucleus; the latter group needs to have assured connectivity to an Internet network and availability of technological tools to access educational programs, as well as affinity with the virtual training processes and developed competences that allow a correct appropriation and adaptation to the environment.

It is important to emphasize that the research identified here revolves around the search for new and better teaching modalities based on the use of technology for this purpose, therefore, the competencies to be developed through the training processes must be in tune with the needs that the technological era demands. For this reason, higher education institutions have devoted efforts to the constant training and feedback of teachers in charge of implementing the pedagogical strategies designed by the educational management.

Conclusions

This review article concludes by highlighting the importance of knowing the updated state of the bibliography published in databases such as Scopus or WoS, regarding the study of the development of Educational Competencies according to the Teaching Modalities and the current trend followed by higher education institutions, which point to the implementation of strategies based on the use of ICT for the training of professionals, highlighting the generation of academic programs under three modalities, two that have been traditionally offered by the same which are face-to-face and virtual, and a new proposal generated in the framework of the pandemic caused by the COVID-19 which is the Hybrid modality, which involves face-to-face and virtual methodologies, either remotely synchronous or asynchronous.

For this purpose, it has been necessary to constantly train the teaching staff in the use of these tools. However, thanks to the analysis of

the bibliographic material referenced in this article, in most cases these institutional efforts have not been sufficient to achieve an efficient implementation of hybrid strategies as a new academic training modality since it is necessary to enhance the digital skills of teachers to take advantage of each tool designed and/or proposed by the educational management and impact the training of professionals in Latin America.

It is important to highlight that evaluation systems have been implemented to measure how efficient the implementation of ICTs in higher education has been, and that through them it is possible to know the impact generated in the student body since many of these technological tools it is possible to know data and useful information for feedback processes and even reengineering in them, revealing strengths and weaknesses in the teaching-learning processes that constitute an important source of information in the search for new and better teaching strategies and modalities. The above is of great importance because the academic world has faced one of the most important crises in recent history, due to its scope and impact, so it was possible to learn about aspects to improve that were traditionally ignored, such as coverage in education, access to quality education, updating in terms of technological tools and the search for competitiveness in the sector through innovation. Therefore, knowing the current status of the bibliographic material published in high-impact journals indexed in databases such as Scopus and WoS, as well as its impact and scope, is of great importance in measuring the efficiency of the different teaching modalities and their influence on the development of educational competencies, hoping that this information represents an important theoretical basis in the execution of research aimed at the analysis of the educational competencies proposed within the different levels of academic training.

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