Rev. Spirat. 2025;3(SN1): e5526
DOI: 10.20453/spirat.v3iNE1.5526

Competencies of the XXI century teachers for sustainable development within the framework of the 2030 Agenda

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Abstract

Competencies in education have faced challenges throughout the 21st century, so it is pertinent to reflect on the skills, knowledge and attitudes required by teachers in higher education in terms of the demands of today's society in terms of innovation, research and promotion of the quality of education; For this reason, the general objective is to identify and characterize the pedagogical and didactic skills that teachers require in relation to cultural, emotional and technological elements. Based on a systematic review of a qualitative-descriptive nature, some databases such as Scielo, Redalyc and Dialnet are reviewed in relation to the Fundamental Competencies for Sustainable development, and the main categories are obtained: environmental and cultural competencies, socioemotional and digital, subcategories, descriptors and objectives. This information is organized in figures and tables. It is emphasized that these studies address different significant strategies that allow leading the educational process from various points of view, problems, actions and resources, they also provide knowledge and expand the analysis, and provide new experiences to exchange in life in society.

Keywords: Teaching competencies, Environmental and cultural competencies, Socioemotional competencies, Digital competencies

Introduction

This article addresses the XXI century competencies that play a fundamental role in the educational process to face new challenges in society; Therefore, currently it is essential to train people in transversal skills where new trends are linked within the framework of Education for Sustainable Development (ESD) as a response of the educational sector to the different challenges faced. In this sense, it is pertinent to carry out a systematic review of the literature, carrying out a process of refinement and selection of documents, categorization and description of the contributions of each of them.

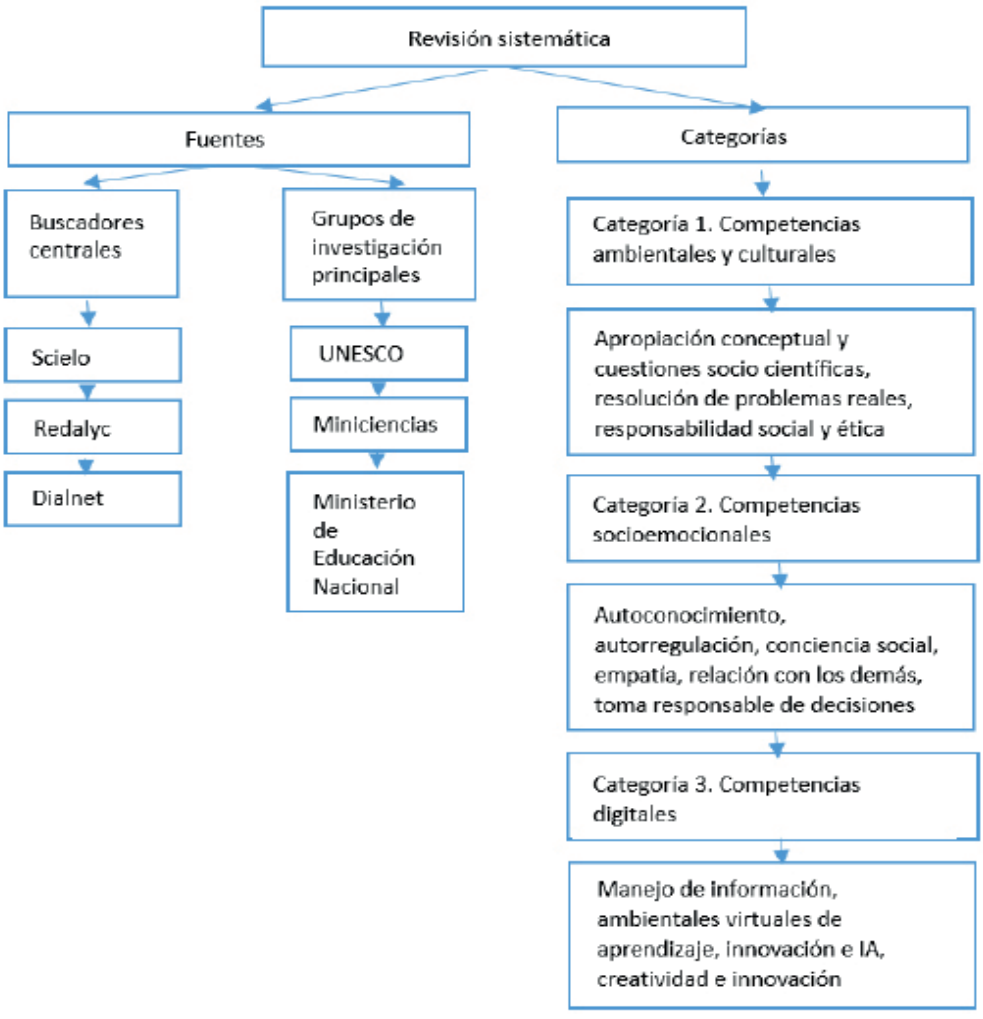
Theoretical Framework

Teachers' competencies constitute thinking actions and skills that enable them to teach specific fields of knowledge, depending on their professional training, conduct research on their own practice and on how to improve student learning. There are various competencies that arise from different references, from the perspective of M. A. Zabalza, (2010) defines five approaches, as follows: Cognitive-based competencies; competencies as the sum of knowledge that professionals must possess. Performance-based competencies, that is, the set of practical actions that teachers must be able to execute; in addition to knowing what, they need to know how. Consequencebased competencies,

the effective exercise of a function, are determined based on the results of operations carried out by the teacher and the changes achieved. Affective competencies, referring to attitudes, ways of acting, sensitivity and values. Exploratory competences defines the sum of experiences experienced by the teacher and the relationship with other competences. Zabalza, (2010) incorporates one more category taking Houston as a reference, and it corresponds to lifelong learning, it includes the set of knowledge, skills, and abilities that the subjects already possess.

Methods

The methodological process consisted of a systematic review with the objective of synthesizing the available evidence on a particular research topic to provide a characterization of the research associated with the study topic in an objective manner. This approach focuses on the synthesis and evaluation of available evidence on the research topic. The review of documents developed in national and international entities is proposed; This denotes the result of scientific production on the topic of interest (Meca, 2010). An analysis of the descriptive scope of the information found defined by Hernandez (2014) was carried out as a way of collecting information for the description and sample of the topic under study. Therefore, databases such as Dialnet, Redalyc, Google Scholar and Scielo were reviewed among the main sources and additionally the databases of Minciencas, UNESCO and the MEN were explored to track the groups that have developed work in the area.



The selected categories emerged from common themes in the bibliographic production found, the skills training needs of teachers and students, and their challenges.

Results

Through the collected data, the categories, subcategories and their corresponding description are constructed, as evidenced in Table 1.

Fig. 1. Methodological process. Systematic review

CATEGORIES	SUBCATEGORIES	DESCRIPTION
Environmental and cultural competencies	Conceptual appropriation and socio-scientific issues Problem solving in real situations Social responsibility and ethics of scientific reasons	The orientation in the teaching competencies of the XXI century must include environmental and cultural teaching as an absolutely necessary aspect to adapt to the changes in the current world, which must be seen by students as a human construction, with multiple controversies that require development.
Socio-emotional competencies	Self-knowledge Self-regulation Social awareness Empathy Relationship with others Determination Responsible decision making	Socio-emotional competencies include affective areas such as emotional awareness and management, relationships with others and projection towards society. Through these, people know each other more and better.
Digital skills	Virtual learning environments Innovation and AI Creativity and innovation Ethical values privacy and security	Digital competencies are emphasized in a set of skills for the appropriation of technology, encouraging critical thinking and new trends for the training of creative leaders and rethinking the technological component from a social approach that contributes to creativity, ethics and innovation.

After tracking the categories, some indicators were established as shown in Table 2. These were considered relevant for aspects such as updating, pedagogical and didactic relevance, and impact on current society.

Table 2. Information collection and analysis format

Year	KeyWords	Title	Author	DOI/	Aim	Competence	ISSN/LINK
2023	Impact, technology, learning, Information	Impact of and Communication Technologies in 21st century education: Bibliometric review	Fonseca, I.P. Bernate, J.A.,	DOI: 10.31876/rcs.v29i1.39748	Determine the pedagogical contributions of technology in education	Digital Competencies	Education,
2022	TIC Skill teachers, university students, students, Colombia	TIC Skill of university teachers from the perspective of students.	Hernández\Vergel, V.K., Amaya Mancilla, M.A., Prada Núñez, R.	DOI: 10.52080/rvgluz.27.99.20	Describe the level of Information and Communication Technologies (ICT) competencies presented by the teachers of the Occupational Therapy program at the University of Santander, from the perspective of their students.		

20 19	Digital skills; information literacy; digital content creation; millennials; higher education	Information management and creation of digital content in the millennial prosumer	Castillejos López, Berenice.	http://www.udgvirtual.udg.mx/apertura/index.php/apertura/article/view/1375	Analyze the processes of information management and creation of digital content in university students of a public institution in Mexico.	
2021	Environmental competence problem solving	Key environmental competencies in science teaching activities	Mora W. Guerrero N.	https://www.redalyc.org/journal/6142/614274348013/html/	The resolution of complex problems of environmental sustainability is oriented, in real cases of socioenvironmental issues which differ from traditional chemistry, physics and biology	Environmental Competence.
2020	Environmental competence, problem solving, environment.	Problem solving and its contribution to the understanding of the concept of environmental competence.	Sepulveda G, Y.	https://repositorio.autonoma.edu.co/bitstream/11182/1170/1/Resoluci%C3%B3n_problemas_su_aporte_comprensi%C3%B3n_concepto_ambiente.pdf	It is recognized that problem solving generates cognitive conflicts, thus developing skills by recognizing the situation and generating ethical alternative solutions.	
2018	Ecological ethics, culture environmental competencies	Ecological ethics: A cultural reconfiguration of the meaning of nature.	Caicedo, G.	https://doi.org/10.5281/zenodo.1439066	The techno-scientific domination of nature preys on the main living conditions on the planet. The risk of civilizational collapse is imminent due to an extractivist and mass consumption economy that disregards the laws of reproduction of nature.	

2022	Education socio-emotional and moral competencies faculty educational system teaching experience education	Education its relationship with the competencies socioemotional and morals of faculty at school	Núñez- Flórez J. Llorent	https://doi.org/10.17811/rifie.51.2.2022.171180	Know inclusive Socio emotional competence	inclusive inclusive and y education in non- university educatiocn from the perspective of teachers, and the relationship with their socio-labor characteristics and socio-emotional and moral competencies.
2022	emotional competence; social competence; systematic review	teachers Socioemotional competencies in primary and secondary teachers: a systematic review	Lozano-Peña, SáezDelgado y López-Angulo	ISSN en linea 16887468 DOI: https://doi.org/10.22235/pe.v15i1.2598	Characterize theoretical and methodological elements of empirical research on socio-emotional competencies of teachers	
2020	Socio-emoticnal competencies, Teachers, Socioemotional competencies of students, School coexistence, Citizenship training	Socioemoticnal competencies in the educaticnal context: A reflection from contemporary pedagogy	López López, Zagal Valenzuela Y Lagos San Martin	https://doi.org/10.22320/reined.y3i1.4508	Reflect on the changes and transformation that the educational model focused on student learning has generated with respect to teacher training	

Conclusions

The research described throughout this article covers didactic innovations in the training of teachers in higher education, therefore, it is necessary to generate strategies to update and improve pedagogical skills from the local to the international through appropriate training programs that consider aspects that promote Sustainable Development and World Citizenship where permanent innovation, contextualized teaching methods are stimulated and conditions are ensured in order to guarantee the excellence of research and the training of committed and socially and emotionally responsible human beings.

Limitations

In the research review, the bias in educational strategies in technological literacy and the few inclusive tools were identified as a limitation for the rural population.

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