



PERCEPTIONS OF UNIVERSITY TEACHERS ON THE USE OF ICTS IN TEACHING: AN EXPLORATORY QUALITATIVE STUDY

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ABSTRACT

Objective: Analysis aims to analyze the perceptions of university teachers about the use of ICT in teaching from a exploratory study.

Methods: Fulfill this a documentary search of 22 articles carried out on University of Ecuador regarding the use and perception of ICT in university teaching; second, the theoretical foundation and relevant findings on the topic are selected to form an analysis regarding possibilities and opportunities for improvement; Third, a discussion is carried out that allows the understanding of social representation phenomena regarding ICTs in Ecuadorian universities. As a methodology, an exploratory qualitative study is implemented through a literary review that accounts for the phenomenon of teachers' perceptions in the use of technologies as a fundamental tool for learning. Thus, the documentary search is carried out in studies from Ecuador that have been completed for a maximum of 5 years.

Result: As a result, the analysis seeks to form an analysis that explains teachers' perceptions and build strategies that help improve their application for teaching.

Keywords: Perceptions, Information and Communication Technologies (ICT), University Education, Teaching.

PERCEPÇÕES DE PROFESSORES UNIVERSITÁRIOS SOBRE O USO DE ICTS NO ENSINO: UM ESTUDO QUALITATIVO EXPLORATÓRIO

RESUMO

Objetivo: O estudo tem como objetivo analisar as percepções de professores universitários sobre o uso das TIC no ensino a partir de um estudo exploratório.

Métodos: Foi realizada uma pesquisa documental de 22 artigos realizada na Universidade do Equador sobre o uso e percepção das TIC no ensino universitário; segundo, são selecionados os fundamentos teóricos e os achados relevantes sobre o tema para formar uma análise sobre possibilidades e oportunidades de melhoria; Em terceiro lugar, é realizada uma discussão para compreender os fenômenos da representação social em relação às TIC nas universidades equatorianas. Como metodologia, implementa-se um estudo qualitativo exploratório por meio de uma revisão literária que dá conta do fenômeno das percepções dos professores no uso das tecnologias como ferramenta fundamental para a aprendizagem. Assim, a busca documental é realizada em estudos no Equador que não tenham mais de 5 anos.

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Resultado: Como resultado, buscamos formar una análise que explique as percepções dos professores e construa estratégias que ajudem a melhorar sua aplicação ao ensino.

Palavras-chave: Percepções, Tecnologias de Informação e Comunicação (TIC), Educação Universitária, Docência.

PERCEPCIONES DE LOS PROFESORES UNIVERSITARIOS SOBRE EL USO DE LAS TIC EN LA ENSEÑANZA: UN ESTUDIO CUALITATIVO EXPLORATORIO

RESUMEN

Objetivo: El estudio tiene como objetivo analizar las percepciones de los docentes universitarios sobre el uso de las TIC en la docencia a partir de un estudio exploratorio.

Métodos: Se realizó una búsqueda documental de 22 artículos realizados en la Universidad del Ecuador sobre el uso y percepción de las TIC en la docencia universitaria; segundo, se seleccionan los fundamentos teóricos y hallazgos relevantes sobre el tema para formar un análisis respecto de posibilidades y oportunidades de mejora; En tercer lugar, se realiza una discusión que permita comprender los fenómenos de representación social respecto de las TIC en las universidades ecuatorianas. Como metodología se implementa un estudio cualitativo exploratorio a través de una revisión literaria que da cuenta del fenómeno de las percepciones de los docentes en el uso de las tecnologías como herramienta fundamental para el aprendizaje. Así, la búsqueda documental se realiza en estudios del Ecuador que tengan una antigüedad máxima de 5 años.

Resultado: Como resultado, se busca formar un análisis que explique las percepciones de los docentes y construir estrategias que ayuden a mejorar su aplicación a la enseñanza.

Palabras clave: Percepciones, Tecnologías de la Información y la Comunicación (TIC), Educación Universitaria, Docencia.

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1 INTRODUCTION

Information and Communication Technologies (ICTs) establish a fundamental factor for teaching in a way that facilitates the transmission, access, and transformation of knowledge from the strategies proposed by the teacher in the school environment. Thus, teaching processes require the implementation of effective knowledge strategies that help students understand the phenomena of reality and thus, form effective problem-solving practices using the acquired knowledge. In accordance with the above, the field of ICT incorporation is an area that encompasses a broad analysis since it constitutes a fundamental tool for knowledge in the 21st century. Therefore, for the present objective, a discussion is proposed on the perceptions that teachers have regarding digital technologies to incorporate forms of information and communication. Based on this analysis, the aim is to understand the social representations that teachers have about this tool and how they use it to achieve knowledge and knowledge transformation.



In this sense, this article aims to analyze the perceptions of university teachers regarding the use of ICT in teaching through a qualitative exploratory study of literary review. To do this, first, a documentary search of studies conducted in Ecuador on perceptions of technology use in universities is carried out to understand its implementation and practical opportunities for student knowledge. Secondly, an analysis is made around the main categories and the definition of perception in line with the learning objectives that professional subjects must acquire from university. Thirdly, a discussion is built around the theoretical foundation and the results found in the studies included in the analysis, so that a comprehensive perspective on how teachers in Ecuador use technology and the improvement opportunities it builds can be understood. Regarding the methodology, an exploratory qualitative analysis is implemented from the documentary search and the analysis of results and data acquired, in order to explore the phenomenon in the context of Ecuadorian universities.

2 DEVELOPMENT

The use of Information and Communication Technologies (ICTs) constitutes a fundamental task for achieving significant impacts on learning within educational levels and systems, specifically in strengthening life competencies in individuals. Thus, the implementation of technologies in the learning process of university students is essential to instill motivations and application spaces for thematic content among learners. Therefore, the teacher plays a crucial role in guiding and organizing strategies to build and transform knowledge through student participation. Consequently, the perception and use of technologies by teachers construct a path of teaching through this tool, whether positive or negative depending on its manifestation. Hence, it can be affirmed that negative perceptions of teachers towards technologies hinder the construction of digital teaching environments.

In line with the above, Paredes-Prada states that the use of ICT in university education is a topic analyzed in recent research as it constitutes a fundamental step for the teaching and learning process, leading to changes in the ways content is transmitted and applied. From this perspective, the use of digital platforms and technologies influences learning, a situation that should be encouraged by teachers to establish digital literacy paradigms. Additionally, Martinez et al. mention that the use of ICT poses a challenge for teachers in both offline and online environments, as it requires the task of enabling students to acquire and apply learning through interactivity. Therefore, ICTs present a challenge for teachers as they require specific competencies to improve learning environments and facilitate teaching approaches.



2.1 PERCEPTION OF ICT USE IN UNIVERSITY TEACHERS

Perception is a cognitive process of awareness that involves the recognition, interpretation, and significance of tools or phenomena for forming judgments about sensations obtained from the physical and social environment. Thus, the perception of ICT use explains the ways in which teachers recognize digital technologies, based on their experiences or lack of knowledge regarding the tool. A study on teachers' perception of the link between technologies and education mentions that teachers agree that technologies improve teaching organization and enhance active listening and student participation. Therefore, teachers' perceptions of ICT use integrate usage experiences and observation processes that allow them to understand the tool and form critical opinions regarding its employability and effectiveness for learning.

Consequently, the type of usage that teachers give to media in their practices constitutes distinctions between theory and curriculum. If teachers make appropriate use and form positive perceptions of technologies, then analytical practices of information are formed, leading to representations, problem-solving, and learning through new teaching systems: interpretation and relationship of knowledge with the context. From the perspective of teachers, students perceive technologies as functional tools for knowledge and its transformation, or conversely, they limit their learning to using them in recreational settings disconnected from the educational context.

2.2 TECHNOLOGICAL USE COMPETENCIES FOR TEACHERS

Moreover, Sumba-Nacipucha asserts that in the new educational context marked by the coronavirus, teaching practices must reformulate by incorporating ICT in a relevant manner in content and theories teaching so that they are applicable to real-life contexts and can generate simulation spaces through digital means. Therefore, a conceptual analysis of the TPACK model proposed by Koehler and Mishra is suggested. They seek to define three primary types of knowledge and their intersections, which teachers must master: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). Additionally, they define pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and finally, technological pedagogical content knowledge (TPACK).

To explain further, CK defines what is taught and refers to teachers' knowledge and expertise in the area they teach, generating reflections and learnings about theories, concepts,



models, evidence knowledge, and tests. Secondly, PK indicates how teaching should be conducted and addresses the knowledge that teachers handle to design, develop, and implement strategies, thus having the task of teaching and simultaneously transmitting valuable learning for individual needs and interests. Thirdly, TK relates to the digital competencies that teachers must have clear understanding of to handle various tools and available technologies. Fourthly, PCK allows the teacher to select skills to improve strategies and thus establish pedagogical techniques for the beneficial acquisition of knowledge. Fifthly, TCK defines the appropriate tools for use in communication and content teaching, so teachers must be familiar with digital tools and platforms to achieve learning outcomes. Sixthly, TPK strengthens the pedagogical proposal through ICT implementation, based on previously established objectives. Finally, TPACK addresses the intersection of previous knowledge and the definition of new learning that constitutes the efficiency of teaching and learning through technology.

3 METHODS

Considering the objective of analyzing the perceptions of ICT use by university teachers in Ecuador, a qualitative exploratory analysis is conducted through a literature review. With this in mind, the aim is to deepen the analysis of the importance for teachers to build positive perceptions regarding ICT and to understand their use in order to establish practices of technological innovation. In doing so, these practices enable knowledge and assist students in applying it responsibly in both practice and reality. For this article, a literature review is conducted on studies carried out in Ecuador regarding teacher perceptions in the university context, focusing on main categories such as ICT usage and teachers' perceptions of technology. This is done to fulfill the general objective and contribute to the discussion on the appropriate implementation of ICT.

3.1 EXPLORATORY STUDY

According to Hernández-Sampieri and Mendoza-Torres, an exploratory study involves the examination of a new or little-studied phenomenon or research problem, about which there are doubts. Thus, a literature review is implemented to reveal guidelines on the study problem and consider new perspectives. Therefore, the analysis focuses on delving into the importance of teachers' perceptions of technology use, as personal motivations or traditional methodologies in the classroom are often overlooked, hindering the use of technology to transform learning.



Hence, through an exploratory study, contributions are made to the discussion on perceptions of technology use that enhance access to information and foster effective communication scenarios, including teacher-student interactions.

In line with Sampieri-Hernández et al., a literature review involves the detection and consultation of relevant bibliography and materials for the study's purpose. This requires gathering pertinent information to frame the research problem, necessitating a selective search that adheres to a thorough analysis published in journals of interest for knowledge and research. Thus, this article conducted a literature review to deepen understanding of teachers' perceptions of technology use in university institutions, aiming to broaden the analysis of the phenomenon and contribute to the discussion on the importance of creating strategies that define knowledge through technology.

3.2 POPULATION

For the bibliographic search, a total of 22 articles were considered, obtained from academic databases such as Scielo, Redalyc, Dialnet, and Google Scholar.

3.3 INCLUSION CRITERIA

The included articles must have been published within the past five years, contribute relevantly and appropriately to the study, and facilitate a profound analysis that clarifies teachers' perceptions of ICT use. Additionally, they should provide strategies that enhance perspectives and, consequently, knowledge practices. Lastly, only studies conducted in Ecuador were considered.

3.4 EXCLUSION CRITERIA

Articles that do not meet the specified inclusion criteria were excluded from this study.

Considering the stated objective, a qualitative methodology was implemented with an exploratory intent, drawing from previous studies regarding the perceptions of university teachers in Ecuador. To carry out the exploratory study, a search for 22 articles was conducted in academic databases, ensuring they provided in-depth analyses, highlighted knowledge gaps, and facilitated the construction of positive perceptions regarding the use of digital technologies.



4 RESULT AND DISCUSSION

The literature search identified that studies conducted on teachers' perceptions of ICT use in teaching are minimal. The majority of research or studies focus on analyzing the use of ICT as a fundamental tool for learning but do not specifically delve into the impact of teachers' perceptions on the generation of strategies and the appropriate use of technology for the construction of practical knowledge in universities. This justifies the need for an exploratory study to provide a precise contribution on the importance of building positive perceptions and knowledge of technologies among university teachers, so that the practices implemented by professionals can be enhanced through digitality and interactivity. Therefore, a classification of three main categories guiding the present analysis is established: firstly, the use of ICTs in higher education in Ecuador; secondly, teachers' perception of technologies, virtual education, and online learning; and lastly, teachers' digital competencies for teaching. The aforementioned is presented in the following table:

Table 1

Studies Found by Analysis Categories

Category	Number of Studies Found
Use of ICTs	11
Teachers' Perception of Technologies, Virtual Education, and Online Learning	9
Digital Competencies	2
Total	22

Source: Own elaboration

According to Table 1, a total of 11 studies focus on the analysis of ICT use, while 9 studies analyze teachers' perceptions of technologies, virtual education, and online learning. Additionally, 2 studies focus on teachers' digital competencies for the appropriate implementation of ICT. The studies were conducted using databases such as Redalyc, Scielo, Dialnet, and Google Scholar, classified as follows:

Table 2

Studies Found in Academic Databases

Database	Found	Selected
Scielo	13	5
Dialnet	9	4
Redalyc	7	6
Google Scholar	43	7
Total	72	22

Source: Own elaboration



According to Table 2, a total of 72 studies were found with the search conducted in Ecuador from 2019 to 2024, focusing on the main categories: ICT use and teachers' perceptions regarding ICT in teaching. Specifically, in Scielo, 5 studies met the inclusion criteria and contributed to the study topic. In Dialnet, 9 studies were identified in Ecuador and other Latin American countries, of which 4 were selected to aid in generating a solid analysis based on recent studies. In Redalyc, 7 studies were found, of which 6 were selected as they provide a critical and diverse perspective on technological platforms from the viewpoint of university teachers. Finally, Google Scholar yielded a large number of investigations, of which 7 were selected because they constitute relevant studies for the objective of the present article.

5 DISCUSSION

The study by Espinoza-Cedeño et al. (3) asserts that basic education in Ecuador encompasses levels of study aimed at developing students' abilities to communicate, interpret phenomena, and solve problems in reality, thereby understanding natural and social life. It includes a focus in the Ecuadorian education proposal on the students' ability to apply ICT to solve practical problems and engage in meaningful academic activities implemented by teachers. Additionally, Paredes-Parada's study (4) indicates that since 2008, governmental changes have been implemented in Ecuador to improve the quality of higher education institutions through ICT, aiming for teachers to use supportive tools in their classes. However, the limited usage of interactive tools by teachers is evident due to weak technological infrastructure and limited technological access in the institutional environment.

In line with this, Sarmiento-Torres (6) states that proper teacher training and availability of training opportunities enable the creation of accessible technology environments for teaching. Moreover, Scolari (10) emphasizes the importance of educational communities providing teachers with training to create digital environments and use ICT with expectations of innovation and creativity in the classroom. Therefore, teachers' expectations regarding ICT usage depend largely on the training and digital literacy programs provided by institutions, and consequently, the acquired competencies enable them to enrich learning environments and facilitate teaching approaches. Practically, the studies found suggest that teachers' perceptions of ICT usage need to be enhanced by institutions through training strategies. Specifically, Calle et al.'s study (11) highlights that teachers' perceptions of ICT usage remain consistent whether in face-to-face or virtual environments, indicating a lack of significant use of technologies in



knowledge formation. Hence, they conclude on the necessity of developing training processes to teach the proper implementation of technologies.

Moreover, Díaz-Vera et al. (12) state that standards for ICT competencies in teachers were proposed in Ecuador since 2008 to consolidate positive perceptions of their implementation. However, there is little evidence of a significant change in the adoption and application of ICT as a fundamental requirement among teachers. Despite the educational standards for ICT competencies in teachers, the study concludes that neither teachers' nor students' perceptions and motivations for use have improved due to the absence of responsible teaching processes through technologies. Another study determines that teachers' satisfaction levels regarding technology for teaching are moderate due to existing technological gaps hindering effective instruction and appropriate use for theoretical and practical content treatment (13).

All the aforementioned evidence suggests that teachers' perceptions of ICT usage greatly depend on the opportunities they have for accessing interactive platforms and the formal training spaces provided for the acquisition of digital competencies guiding teaching skills. López et al. (14) affirm that teachers perceive virtual education levels requiring more assistance to establish new teaching modalities, with teachers being the qualified entities to construct interaction and new learning from technology. As Arroyo-Vera et al. (15) mention, "virtual teachers will be responsible for enriching that learning space with key contents for the student. The use of practical icons and activities aimed at stimulating autonomous learning generate competencies." In line with this, authors agree that formalizing technology learning is a necessity in the academic community, supported by teachers' perspectives on ICT usage in teaching.

Furthermore, Tejedor et al.'s research (16) findings indicate that surveyed teachers in Ecuador believe that institutional training should go beyond the instrumental character of ICT, including complementary dimensions based on the curriculum, pragmatics, educational psychology, graphic design, evaluation, time management, among others, such as research and communication skills. Thus, teachers' perceptions of ICT are critical in recognizing the need for improvements in teacher competency acquisition to enable them to implement teaching facilities properly.



5.1 STRATEGIES FOR ICT APPLICABILITY IN HIGHER EDUCATION

Analyzing Martínez-Sanz and Arribas-Urrutia's study (17), digital literacy dimensions include: acquiring skills in using tools linked to information technologies; mastering forms and methods of accessing web resources; the ability to apply the use of technological tools in research and professional knowledge application; the skill to disseminate information; vision and understanding of the set of technological innovations; and the ability to critically evaluate benefits. All these constitute tools for strengthening university teachers' perceptions of technology usage, as they encompass not only skill acquisition but also reflection and critical consideration of their use in the educational setting.

Chávez et al.'s study (18) confirms that virtual education requires teachers' flexibility as there are still challenges hindering students' learning acquisition. This is because teachers do not use digital platforms in the university context, and furthermore, digital gaps in some students' places of residence hinder the proper implementation of technologies and digital environments in teaching. Therefore, it is proposed to formalize strategies to reduce these gaps and enable higher education to provide alternatives to facilitate the teaching and learning process, ensuring both teachers and students strengthen their digital competencies.

Another proposal is the incorporation of resources for autonomous learning and the use of computer resources that determine assisted teaching, dynamic information, and communication among students. This is because the use of computer resources as a means of communication and information involves the use of search engines, social networks, emails, as well as PowerPoint presentations, videos, didactic guides, among others (19). Thus, teachers' perceptions of ICT usage prompt critical reflections on institutional challenges and also propose solutions such as the availability of infrastructure or devices for learning.

In addition, Esparza-Cruz's study (20) implemented with UTB teachers confirms that teachers' perceptions of ICT usage have a high level, as 87% of them claim to be trained to guide.

6 CONCLUSION

In conclusion, teachers' perceptions of ICT usage entail the need to build environments for digital competence training, which help teachers to guide students and, above all, to create beneficial teaching environments. Thus, the literature review determined the existence of categories of ICT usage in teaching, perceptions of their usage, and digital competencies, which shed light on teachers' practices and the availability of platforms for learning, ensuring



continuity and correct implementation in virtual settings. Ultimately, technologies provide learning opportunities through digital platforms, social networks, email, presentations, audiovisual formats, among others, enabling students to understand real-world phenomena and apply their knowledge practically.

Therefore, persistence in ICT usage shapes positive and robust perceptions of their usage in teaching among teachers. This is because the studies found indicate that both the infrastructural readiness of the space and the frequency of its implementation and usage facilitate the incorporation of digitality in learning. It is clear, then, that teachers perceive technologies as a fundamental tool in teaching, and thus, digital competencies must be strengthened through training processes that enable teachers to create activities using digital platforms. Likewise, it allows students to contemplate their skills and engage in autonomous learning processes professionally.

Consequently, teachers' perceptions of ICT usage reveal an acknowledgment of technological availability shortcomings in Ecuadorian university institutions, which explain the gaps in application in the school environment. Thus, teachers are aware of the training activities they must undergo for technology to become a tool for improving learning. In light of all the findings, it is important to delve deeper and reiterate the analysis of perceptions of ICT usage to undoubtedly understand the shortcomings and lack of knowledge and application of ICT in the university environment by teachers as knowledge guides in Ecuador and Latin American countries.

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