INPLASY

Educational Quality and Its impact on the use of TIC´s in Higher Education: A Systematic Review

INPLASY202530033
doi: 10.37766/inplasy2025.3.0033
Received: 7 March 2025
Published: 8 March 2025

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ADMINISTRATIVE INFORMATION

Support - No Support.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202530033

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 March 2025 and was last updated on 8 March 2025.

INTRODUCTION

Review question / Objective The objective of this systematic review is to analyze and describe through scientific literature the educational quality and its impact on the teaching-learning process with the use of educational technology, both with teachers and students of higher education who are immersed in online education.

Condition being studied Technologies are transforming the way of doing things in all social spheres and at all levels, even modifying the ways of behaving and thinking. It is therefore clear that any change in education, regardless of the educational level to which we refer, requires an improvement in the teaching staff. This improvement should not be limited only to improving the scientific knowledge and topics that teachers have, nor their pedagogical skills and abilities to transmit them to students, but should also incorporate other elements.

METHODS

Search strategy A search was conducted in different databases using the keywords in English and Spanish, which were: educational quality, ICT, higher education, as well as the Boolean operators and the application of filters were explored with the use of "AND" in the four databases (Scopus, ScienceDirect, Mendeley, Dialnet and Redalyc) published between 2015 and 2024, For this search, the titles and abstracts of the articles were analyzed, followed by the full text of those that met the inclusion and exclusion criteria.

Participant or population University context.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included The procedure recommended by the PRISMA Statement (Moher et al., 2015; Page et al., 2021), which provides a manual for systematic reviews and meta-analyses

(Moher et al., 2015), was followed in conducting this systematic review. Additionally, the CASPe evaluation tool (López, 2021) was applied too verify the quality of the studies.

Eligibility criteria The search criteria were: 1) articles related to the topic; 2) articles written in Spanish and English; 3) open access articles; 4) articles published in the last 10 years.

Information sources For the research, open access articles published between 2015 and 2024 were consulted, this search was performed in the following databases: Scopus, ScienceDirect, Mendeley, Dialnet and Redalyc.

Main outcome(s) According to the objective of this systematic review, it was found that some authors focused on evaluating educational quality and its impact on the use of ICTs in higher education through questionnaires applied to the users directly involved; teachers and students.
The main objective of the study was to determine the gap between teachers and students in the use of ICTs in the teaching-learning process and to evaluate whether the digital gap can be reduced. For this purpose, a quantitative research was carried out involving 1,039 participants, of which 133 were teachers and 906 students. The results obtained in the research conducted by Paredes-Parada, (2018) found that students mainly use Internet-based technology, although not always for educational purposes. Teachers use more conventional instruments such as computers and projectors. It is advisable to promote the academic use of cutting-edge technologies and decrease the technology gap through technology policies that involve teachers in the teaching and learning process. This can only be done once the technological gap between teachers and students has been reduced.
However, Dang et al., (2024) show in their study the relationship between teachers' digital competence and students' learning value in higher education, using a quantitative type study on 26 Teachers, validating the positive impact of six dimensions: Professional Engagement, Digital Resources, Teaching and Learning, Assessment, Student Empowerment and Student Facilitation. Of which gave him as a result the digital competence in the value of student learning, as well as (Paredes-Parada, 2018) it is recommended to encourage digital training of teachers.
In this same line, Peng et al., (2024) identified the relationship between attitudes, self-efficacy and digital competence of teachers in the integration of ICT in teaching, doing a quantitative research in 680 Teachers and highlights three main elements that affect their adoption of ICT: attitudes, self-efficacy and digital competence., thus confirming that, these factors have a significant impact on their incorporation in education with the effective incorporation of technology in teaching and learning can be achieved through the application of information and communication technologies. However, the extent to which ICTs are used in educational settings is greatly affected by numerous factors. Improving teacher training in digital competencies is suggested.
On the other hand, an analysis model was developed to evaluate the current state of ICT in higher education in Ecuador, Villegas-Ch et al., 2022 confirm that the incorporation of information and communication technologies in education has become a priority in all teaching models, especially in higher education institutions that have detected the need to incorporate these technologies in the classroom. However, in order to ensure the quality of education and learning, it is essential to establish a process that facilitates the recognition of students' reaction to their use. A quantitative study was applied to a total of 75 students, seeking to create a method to establish the needs and doubts of students about the use of educational technologies in the classroom without affecting their academic performance. Two methods were used, one group makes use of technologies in the classroom and the other group uses a traditional education model, according to the results, the method determines the impact of technology on learning.
Finally, Ricardo et al., (2018) analyzed the deficiencies and advances in teacher training in the use of Information and Communication Technologies in higher education and their impact on teaching, finding that teachers consider that ICT trainings are not aligned with their specific needs. It is a quantitative study in which a questionnaire was applied to 80 professors from different disciplines, who have participated in different training courses. The findings demonstrate the importance of providing training adjusted to the specific needs of the teaching staff, in addition to specialized courses aimed at instructing in the pedagogical use of technologies in each subject with the objective of optimizing their work. Furthermore, it is noted that the training provided at the institution has not succeeded in encouraging teachers to use technologies. Finally, we recommend the implementation of more specialized programs that address the particularities of each discipline in order to improve the adoption and pedagogical application of ICTs.

Additional outcome(s) After performing combinations of keywords used during the search for information in different databases, being debugged with criteria such as year of publication (2015-2024), language (English and Spanish) and that they were open access, 179 articles of interest to the research topic being addressed were obtained, of which 10 were duplicates, 7 are systematic reviews and 28 articles exceeded the

range of years. Of the remaining 134 articles, 100 were excluded because of the title and abstract, 18 did not fit the subject matter, leaving a total of 16 articles, and 11 articles that had Covid-19 subject matter were subsequently discarded. Finally, 5 articles were obtained and considered for this systematic review.

Data management With the results of the search, the process of emptying in Microsoft Excel was started, where columns with relevant information (author/s, year, title, key words, abstract) were placed in order to subsequently apply the inclusion and exclusion criteria, purging those that did not present any contribution for this review, which was carried out by one of the authors. After this process, two authors prepared a new document with the same tool in which the relevant elements of the systematic review methodology were explained in detail: identification data, objective, design and sample, study variables, instrument and software used, and main results.

Quality assessment / Risk of bias analysis The evaluation of the methodological content of the studies was carried out using the CASPe tool to assess the items to be included in each of the articles considered in the eligibility criteria. The CASPe tool was applied according to the instructions established in the guide, consisting of 10 questions in which three aspects were considered for the assessment of quality: rigor; referring to the coherence of the methodology to answer the research question, credibility; pertinence of the results in incorporating the study problem from the perspective of the participants' equality, and relevance; focused on the usefulness of the findings in practice.

Strategy of data synthesis The articles were analyzed with one of the CASPe critical reading tools, designed to evaluate qualitative studies, giving mostly positive results. In conclusion, the systematic review shows the existing scientific limitation on educational quality and its impact on the use of ICTs in higher education.

Subgroup analysis Not applicable.

Sensitivity analysis Not applicable.

Language restriction Other, languagues than spanish and english.

Country(ies) involved México; Spain.

Keywords Educational quality; ICT; Higher education.

Contributions of each author

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