Analysis of the problems generated by the adaptation of teaching caused by Covid-19: Proposal for a new learning framework

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Abstract

After the pandemic crisis caused by Covid-19, we can affirm that the future will increasingly rely on remote methodologies and will most likely continue with hybrid or blended teaching, combining online and face-to-face classes. Article 9 of Spanish Royal Decree 463/2020 ordered the suspension of presential educational activity at all levels in Spanish territory, as it was recommended that distance and online teaching be used whenever possible. Due to these quarantines, education authorities have been forced to modify teaching methods and methodologies in a short period, using existing technological and human resources. Students and teachers have found themselves in a new educational scenario very quickly and traumatically, without being prepared on most occasions.

This paper presents a systematic literature review of the main national and international journals in the Web of Sciences, with the aim of finding out the main problems that the academic community has faced with the rapid adaptation of presential teaching to online or blended teaching. We can conclude that this expeditious change has caused problems that can be derived from (1) technical or infraestructure, (2) psychological and/or (3) formative and normative aspects. We are talking about a new learning framework that involves changes in the knowledge to be applied -pedagogical and technological-, in the didactics used -more collaborative and active- and in the context in which it is carried out -virtualisation of the environment and use of social networks-.

Keywords: Blended teaching, online teaching, innovative ICT, higher education, methodological adaptation, legislation, communication, evaluation, Covid-19.

Introduction

The pandemic caused by Covid-19 has generated restrictions on mobility and social proximity that have disrupted educational activity in a way that has never been experienced before. Although, in the last decade, online learning environments were already on the rise in higher education, they have become more and more common, higher education institutions have had to abruptly adapt their face-to-face teaching to an online learning environment (Zalat et al., 2021).

There is a high level of research interest in the effect of Covid-19 on university education, focusing mainly on the impact of the return to the classroom with effects on students' cognitive processes, motivations and academic achievement (González-Zamar et al., 2021). The willingness of most students to participate in distance learning classes during the pandemic indicates that there is immense future potential for these e-learning platforms in higher education.

However, students faced mixed feelings of loneliness and uncertainty during their learning process, as well as, at times, difficult access to e-learning facilities and potential personal health problems (Ismaili, 2021). There is a need to examine the accessibility of online learning by considering the digital divide of factors related to physical access, skills and motivational factors for some students (Istenic, 2021).

Technology has functioned as a facilitating tool in the face of the challenge that this situation has posed for students, teachers and educational institutions (Al-Amin et al., 2021). But they have also complicated this process when their availability or use has been inadequate (Amzalag et al., 2021). So, technical and infrastructure aspects are important but not the only ones to consider. The quality of education will continue to depend on human factors (Dasheva et al., 2020).

In order to study in an exploratory way the problems faced by university institutions in the implementation of actions to adapt to the pandemic caused by Covid-19, this paper has carried out a systematic review of the literature on this subject. In this way, it has been possible to establish a typology of problems that would allow tools to be designed from a holistic perspective.

Paper

2.1. Theoretical review

The COVID-19 educational experience has had to face problems such as connectivity difficulties, lack of skills for virtual education, and a multiplicity of distractions that may have led to a lower learning quality (Gutierrez et al., 2021). Based on the systematic review of the literature, three main groups have been established in relation to technological, psychological and formative or regulatory aspects.

2.1.1. Technological and infraestructure problems

Technological resources are becoming an ally for teachers, making it necessary to disseminate experiences, such as the use of video tutorials in higher education (Hernández-Ramos, et al., 2021).Technology and infrastructure have not always been adequate due to high peaks in demand and new needs (Mortazavi et al., 2021). Difficulties are grouped under lack of technical support, which includes lack of technical infrastructure and security concerns (Joshi et al., 2020).

The development of a strategic plan for the successful implementation of e-learning through appropriate technological means is therefore required (Zalat et al., 2021). Videoconferencing systems have emerged as learning opportunities for students and instructors. The policies and teaching strategies related to this tool were not prepared to provide an accessible and comprehensive learning experience before the outbreak of COVID-19 (El Khatib et al., 2020). Similarly, the use of intelligent e-learning systems with access to students' social networks or open materials in online repositories would be a useful tool to encourage student interest and participation (Maaloul and Bahou, 2021).

Complementary or parallel to this, there has also been an inequality caused by access to technology and online delivery related to students' personal and economic circumstances (Istenic, 2021). Students faced with financial problems were generally affected more by the pandemic in terms of their emotional life and personal circumstances (Aristovnik et al., 2020). Financial support for students with limited financial possibilities help them purchase a computer, facilitating their adaptation process (Molea and Nastasa, 2020). Aspects such as the digital divide, problems of infeasible consistency of the internet or electricity and large educational/socio-economic inequalities must therefore be considered (Al-Amin et al., 2021).

2.1.2. Psychological problems

Coronavirus disease has drawn attention to mental health problems among students, with problems such as stress, anxiety and depression. Students have felt a concern about learning and assessment methods, a sense of overwhelming burden, increased by having to deal with

technical difficulties or excessive information seeking about COVID-19 (Arenliu et al., 2021).

University students must now adapt to a virtual learning environment and a change in behaviour due to social distancing and socio-economic uncertainties (Salimi et al., 2021).This concludes the need to monitor the mental health of university students during times of crisis (Yang et al., 2021). Psychological variables are crucial to consider when studying new education environments with mobility restrictions, as they are related to motivation and attendance during distance education. While the use of distance education in general increases motivation, synchronous distance education increases attendance (Goksu et al., 2021).

Educational institutions should offer support services, both face-to-face and remote, to alleviate students' fear and anxiety in the face of uncertainty during periods of pandemic or crisis, particularly for the more vulnerable or sinternational students (Arenliu et al., 2021). For example, high levels of social network use have occurred during the pandemic, with significant incidences of addiction. It would be necessary to implement university educational programmes to redirect these addictive behaviours, as well as preventive recommendations (Gómez-Galán et al., 2020). The development of awareness programmes on students' habits related to diet, quality of sleep or physical activity would be helpful to reduce potential stress for students (Elsalem et al., 202). Consideration should be given to allocating resources to provide additional and targeted assistance to students who have suffered the impact of psychological trauma associated with Covid-19, such as bereavement or financial instability (Ihm et al., 2021).

A recognised source of stress in this pandemic period is related to new assessment methodologies and the use of online examinations. The use of a robust exam platform and remote mock e-exams is recommended to reduce potential stress for students (Elsalem et al., 2020).

2.1.3. Formative and normative problems

Distance learning could provide for academic staff improved flexibility and time-saving (Selcuk and Ozcelikay, 2020). However, there is a need to improve teachers' skills in order to address the most important problems that academic staff have had to face during the pandemic period. Mainly, these problems are related to content creation and information processing (Mietule et al., 2021). There are new competences that must be acquired to teach an online course, in such a way that it motivates the student (Cano et al., 2020).. New skills and methodologies have to be acquired by teachers -such as online problem-based learning, action learning or collaborative problem-based learning (Csillag and Hidegh, 2021).

Online or distance learning also offers new opportunities for learners, such as easy access to materials and asynchronous availability of classes (Selcuk and Ozcelikay, 2020). In the absence of adequate training or prior technological knowledge, learners may not get the most out of these opportunities. The lack of digital skills, both for teachers and students, needs to be solved through training programmes or courses (Molea and Nastasa, 2020).

There are numerous technological tools that have facilitated the unethical attitudes of students during the online evaluation (Amzalag et al., 2021). In order to avoid these types of behaviour, it is essential to solve identification and security-related problems (Jusas et al., 2021). The establishment of specific regulations or engagement programmes would help mitigate unethical behavior (Osafo, 2020). In addition, to minimise academic dishonesty, different tools are put in place such as setting different questions per student, making online presentations or combining several assessment methods (Giordano and Christopher, 2020;). A response is required that ensures fairness, legal certainty and transparency for all actors, internal and external (Garcia-Penalvo et al., 2020).

2.2. Research Methodology

As a secondary and exploratory study, the systematic review allows, through a well-defined methodology (Rivero et al., 2019), to obtain knowledge of the "state of the art" of a novel topic. For all these reasons, once the research objectives had been established, the search strategy was established.

The systematic literature review was carried out using the Web of Science database (WOS). To analyse in depth the problems arising from a new higher education scenario due to the Covid 19 pandemic, we selected the following keywords. Firstly, the topics problem and Covid were grouped together. Secondly, to add the educational theme, the topics higher education and university education were grouped together, as both concepts are frequently used as synonyms. So, the search formula used was ("problem" AND "covid") AND ("higher education" OR "university education").

The results have been 104 papers that have been analysed to extract the most relevant information on the problems caused by the necessary adaptability of universities due to the Covid-19 pandemic. Based on the information examined, a theoretical framework has been proposed to resolve related technological, infrastructural, psychological, training and regulatory issues.

2.3. Conclusions

The analysis of the problems related to educational processes during the pandemic allows the establishment of future management models that help the actors involved to find the best solution in the preparation and implementation of distance learning processes. Iorio et al. (2020) have established differences in the effect of the pandemic on academic outcomes and

well-being according to gender, age, geographic origin and sources of funding of actors. So, programmes for holistic health care and wellbeing should therefore be considered (Hidalgo et al., 2021), offering training for their faculty and students when necessary.

Technical aspects are important but not the only ones to consider. In contrast to this improvement by the possibility of choosing the time and place to carry out the training activity. The disadvantage is related to the loss of human contact and the lack of instant feedback that was received in face-to-face education. The quality of education will continue to depend on human factors related to communication, understanding and mutual support (Serfozo et al., 2020).We are talking about a new learning framework that involves changes in the knowledge to be applied -pedagogical and technological-, in the didactics used -more collaborative and active- and in the context in which it is carried out -virtualisation of the environment and use of social networks-. Higher education faculty and administrators need a model for working professionally within the "new normal" that allows them to develop social-emotional support behaviours -e.g., emotional, instrumental, informational- (Lloyd-Jones, 2021), incorporating innovative content and teaching paradigms that allow adaptation to these changes (Naamati Schneider and Meirovich, 2020).

However, more progress is needed in creating operational response strategies through shared governance to respond to future episodes of health crises. Along these lines, it is recommended to broaden inter-institutional collaboration in the development of universities (Koksharov et al., 2021). In addition, structural changes are required to become more adept at meeting these challenges (Miller, 2021) using a holistic view to analyse the situation presented by all those involved.

Our research has several limitations. Although the words used in the search were chosen after careful consideration, the use of other complementary concepts could broaden the search carried out. In addition, the terms have been searched in English, as this is the majority language in WOS. However, this fact excludes research in Spanish.

Although WOS is a more prestigious database, other databases can be used in future research, such as Scopus. This would make it possible to obtain more comprehensive and complementary results to those of this work. Also, this research can be extended to other educational levels, which would make it easier to compare the problems that have been generated. Finally, work can be carried out that includes empirical studies that allow teachers and students to assess both the problem and the associated solution.

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