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Review Article

Impact of COVID-19 on Virtual vs In Person Learning

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Abstract
The COVID-19 emergency brought about an unprecedented transformation in education, forcing an urgent transition from in-person to online instruction. In this context, the educational process was compromised by challenges related to the quality of learning and teacher-student interaction, as well as the limited availability of technological resources. The digital divide and socioeconomic factors exacerbated inequalities in access to and use of technology, significantly affecting educational equity. The findings highlight that teacher training and the optimal use of digital platforms are critical to the success of the educational process in virtual settings, while digital burnout and reduced social interaction negatively impact student motivation and well-being. **Objective.** To analyze the impact of COVID-19 on online and in-person instruction, identifying the advantages and challenges of each modality. **Methodology.** A literature search was conducted in databases such as SciELO, Redalyc, and PubMed, using keywords such as "COVID-19," "online education," "in person instruction," and "educational impact." **Results.** It was found that online learning enabled educational continuity during the pandemic but presented barriers such as the digital divide and a lack of direct interaction. On the other hand, in person instruction promotes collaborative learning and socialization but was affected by health restrictions and changes in school dynamics. **Conclusions.** Online and in-person education each have distinct advantages and challenges. Combining both modalities into a hybrid model can optimize learning and adaptation to future crises.

Keywords: learning, COVID-19, online education, in person instruction, educational technology.

Introducción

The health emergency caused by COVID-19 has brought about an unprecedented transformation in the field of education, forcing institutions around the world to urgently adopt alternative teaching models [1, 2]. In this context, the abrupt transition from in-person to online education was implemented as an immediate measure to ensure the continuity of the educational process, but it also highlighted significant challenges related to the quality of learning, interaction between teachers and students, and the availability of technological resources [1, 2, 3, 4].

Various studies have pointed out that this transition not only affected traditional methodological and pedagogical aspects but also exposed and, in many cases, widened the existing digital divide, deepening inequalities in access to and use of emerging technologies [5]. At the same time, a comparison between online and in person instruction has revealed significant differences in academic performance and student motivation, highlighting the need to review and adapt pedagogical strategies to each context [6, 7].

An analysis of the educational experience during the pandemic has helped identify patterns in the effectiveness and acceptance of both modalities, revealing that teacher training and adequate access to digital platforms are key determinants of the success of the virtual educational process [8, 9]. In addition, further challenges have been documented, such as digital burnout and a decline in social interaction factors that affect both the student experience and the wellbeing of the educational community [10].

Given this scenario, this study aims to evaluate and compare the impacts of COVID-19 on online versus in person instruction, addressing key variables such as the quality of teaching and learning, educational interaction, and the implications of the digital divide. The goal is not only to identify the strengths and weaknesses of each modality but also to propose integrative strategies that will enable a more inclusive and resilient education in the post-pandemic era [11, 12]. Ultimately, understanding these dynamics is essential for guiding the design of pedagogical interventions that overcome the identified limitations and leverage the advantages of each modality, moving toward an educational model that effectively responds to the needs of contemporary society [13].

Furthermore, a review of recent studies highlights the importance of adaptive methodologies and interventions focused on strengthening social interaction and active participation in the classroom, elements considered key to optimizing learning in both in person and virtual settings [14, 15]. This research, therefore, focuses on elucidating the main impacts of the pandemic on the educational sector, with the aim of providing empirical evidence to guide future strategies for the transition and refinement of teaching models.

The information gathered leads us to ask the following question: What are the main impacts of COVID-19 on online versus in person instruction?

Objective

To identify the factors related to the impact of COVID-19 on online versus in person instruction.

Methodology

For this study, we began by searching for relevant information on the impact of the pandemic on educational models. We consulted various articles in recognized scientific databases and repositories, using keywords such as “COVID-19”, “online education,” “in-person instruction”, “educational impact”, and “pedagogical adaptation”. In this way, we were able to compile a broad set of studies that addressed the topic from different angles.

The next step was to review the titles and abstracts of these articles to identify which ones provided specific and useful information for our research. An initial selection was made by excluding those studies that did not meet basic criteria, such as a rigorous methodological design, clarity in the presentation of data, and relevance to the focus of our study. Only those articles that demonstrated the necessary quality to allow for an in depth analysis of the problem were included in the final review.

Additionally, we cross-referenced the information extracted from each article to verify the coherence and consistency of the findings. Through this comparison, we were able to identify which factors were mentioned repeatedly and which appeared to play a more significant role in the effectiveness of online and in person instruction. This process of cross-checking was essential to ensure that the selected evidence was robust and reliably supported the study’s conclusions.

Results

The literature review yielded consistent findings regarding the impact of COVID-19 on online versus in-person instruction. The studies indicated that the abrupt transition to online education allowed for academic continuity but presented significant challenges in terms of access to technology, social interaction, and assessment of learning.

In the context of online learning, evidence shows that the lack of technological infrastructure and the digital divide affected educational quality, especially in sectors with less access to devices and internet connectivity. Analyses conducted at educational institutions revealed that student motivation and active participation declined in virtual settings, affecting academic performance. Furthermore, the study of pedagogical adaptation identified significant variations in teaching effectiveness, finding that students with greater autonomy and digital skills achieved better results.

The integration of data on teaching methodologies has shown that combining online and in person classes can optimize learning. In highly complex settings, such as higher education, it was observed that students who participated in hybrid models showed greater satisfaction and academic performance. Additionally, studies conducted during the first wave of the pandemic highlighted that the rapid implementation of digital platforms and the lack of teacher training were critical factors in adapting to online instruction.

Furthermore, it was found that psychological factors, such as digital fatigue and a lack of social interaction, influenced perceptions of online education. Additionally, in the context of post-pandemic effects, significant findings were reported regarding a preference for hybrid models. In this regard, the combination of in person and online instruction has emerged as a key strategy for improving educational quality and adapting to future crises.

Interpretation

1. Decline in Academic Performance in Online Learning

Evidence suggests that students with limited access to technology and little social interaction performed worse academically. The lack of digital resources and the absence of effective communication with teachers and peers may have hindered their understanding of course content and their motivation to learn.

2. Preference for In Person Learning

The results indicate that many students preferred the in person model due to greater class participation and a better understanding of the subject matter. In person instruction facilitates collaborative learning and allows for direct interaction with teachers, which can promote knowledge retention.

3. High academic stress in online learning

Lockdown and an overload of assignments on digital platforms generated significant levels of stress among students. Difficulties with assessment and an excess of online activities affected mental health and academic wellbeing.

4. Faster Adaptation in Hybrid Learning

It was found that students who participated in hybrid models (online-in-person) adapted better to the new educational conditions. Flexible schedules and access to digital materials allowed for a less abrupt transition in learning.

5. Greater Autonomy in Virtual Learning

Online learning fostered the development of digital skills and self-directed learning. However, this depended largely on students' ability to manage their time and make the most of available technological resources.

6. Challenges in Online Learning Among Vulnerable Populations

The digital divide and lack of access to devices and internet connectivity negatively affected students in low-income communities. Inequality in access to technology became a barrier to online education.

7. Digital Fatigue Among Students

Prolonged screen use and the lack of physical contact led to digital fatigue. Students experienced a decline in concentration and motivation to actively participate in virtual classes.

8. Greater Satisfaction with In Person Instruction

Direct contact with teachers and the opportunity to learn in physical settings had a positive impact on the educational experience. In person learning offers advantages in terms of social interaction and hands-on learning.

9. Impact of Virtual Learning on Mental Health

Anxiety and social isolation were factors that affected students' mental health during virtual learning. The lack of in person interactions may have contributed to a decline in emotional well-being.

10. Preference for Hybrid Models Post-Pandemic

In the wake of the pandemic, students have shown a preference for hybrid models, which balance in person interaction with the autonomy of online learning. This approach aims to optimize the educational experience and adapt to future crises.

Overall, the table shows that each modality has advantages and disadvantages. In person instruction remains key for social interaction and conceptual understanding, while online education offers flexibility and

the development of digital skills. A hybrid model appears to be the ideal alternative for maximizing the benefits of both methodologies.

Discussion

A review of the available information shows that the abrupt transition from in person to online instruction during the COVID-19 pandemic had a significant impact on education. The lack of access to technology and internet connectivity affected the quality of learning, especially in low-income communities. Online instruction, while ensuring academic continuity, presented challenges in terms of social interaction and student motivation[1, 2, 3, 4, 5, 6, 7].

On the other hand, it has been observed that in person education facilitates collaborative learning and active participation, which contributes to a better understanding of the material. However, public health restrictions and the transition to new teaching methods disrupted classroom dynamics. Studies conducted in educational institutions have shown that students with limited access to digital platforms faced greater difficulties with online learning, highlighting the importance of ensuring adequate technological resources [11, 12, 13, 14, 15].

Globally, significant differences have been identified in the effectiveness of both modalities. Students with advanced digital skills were better able to adapt to virtual learning, while those who relied on in-person interaction faced greater obstacles. This combination of factors, access to technology and teaching methodologies, influenced perceptions and academic performance, indicating the need to develop more inclusive educational strategies [10].

In the most critical cases, such as in higher education, it has been observed that students who participated in hybrid models achieved better adaptation and academic satisfaction. Furthermore, studies conducted during the first wave of the pandemic highlighted that the lack of teacher training and the rapid implementation of digital platforms were decisive factors in the effectiveness of online learning [15].

Finally, possible psychological explanations have also been identified. For example, digital burnout and a lack of social interaction affected students' motivation and wellbeing. It has been observed that a preference for hybrid models, combined with adaptive teaching strategies, improves the educational experience and facilitates the transition between learning modalities.

It is essential to recognize that students need support in accessing technology, training in digital tools, and flexible teaching methodologies to optimize their learning in both virtual and in person settings.

Conclusion

The evidence shows that the impact of COVID-19 on education is closely linked to access to technology and teaching methods. Online learning enabled academic continuity but presented challenges in terms of interaction and assessment of learning. In person education remains key to social and academic development, although it was affected by public health restrictions. Combining both modalities into a hybrid model can optimize the educational experience and improve resilience in the face of future crises.

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Table 1. Summary analysis of the impact on the learning experience during the COVID-19 pandemic.

N (sample)	Main result	Average age (years)	Key Factors for Learning
70	Decline in academic performance in online learning [1, 11, 12].	21	Limited access to technology, lack of social interaction
65	Preference for in person learning [2].	22	Greater participation in in person classes, better understanding of content
60	High academic stress in online learning [3, 13].	23	Excessive homework load, difficulty with assessment
55	Faster adaptation to hybrid learning [4, 13].	24	Flexible schedules, access to digital materials
50	Greater autonomy in online learning [5, 13].	22	Development of digital skills, self-directed learning
48	Challenges with online learning among vulnerable populations[6, 13].	21	Digital divide, lack of technological resources
45	Digital fatigue among students [7, 15].	23	Prolonged screen time, lack of physical interaction
40	Digital fatigue among students [8, 13, 15].	22	Direct contact with teachers, collaborative learning
38	Impact of virtual learning on mental health [9, 14, 15].	24	Anxiety, social isolation
35	Preference for hybrid models post-pandemic[10].	23	Balance between interaction and autonomy

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