

Comparative Impact of Virtual and Face-To-Face Education on The Academic Performance and Perception of Accounting Students at A Peruvian University During the Pandemic

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Abstract

The present study compares the impact of virtual and face-to-face education modalities on the academic performance and perception of accounting students at the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas during the COVID-19 pandemic. Through a mixed methodological approach, quantitative and qualitative data from 98 students were analyzed, evaluating their academic performance, interaction, feedback and satisfaction in both modalities. The results show that students in the virtual modality obtained higher academic performance, attributed to the flexibility of online education. However, interaction and feedback were perceived as more effective in the face-to-face modality. Students valued the flexibility of virtual education, but emphasized the importance of personal interaction and the traditional classroom environment to maintain concentration and academic engagement. This study concludes that both modalities have strengths and weaknesses, and suggests that a hybrid combination could offer a more complete educational experience. Improvements in feedback and assessment in virtual environments are recommended, as well as encouraging active participation through interactive technologies.

Keywords: *Virtual Education, Face-To-Face Education, Academic Performance, Student Perception, Educational Flexibility.*

Introduction

The COVID-19 pandemic radically transformed the global educational environment, impacting more than 1.6 billion students in over 190 countries, according to UNESCO (2020). This abrupt change forced institutions to adopt virtual education as the only viable option, raising a number of challenges in terms of technological infrastructure, pedagogical methodologies and students' emotional well-being. In this context, higher education, and in particular accounting programs, will face a unique challenge: adapting specific skills training to a completely virtual environment.

The debate between the effectiveness of virtual versus face-to-face education has been the subject of several recent research studies. Studies such as those by Sánchez and Ramírez (2022) on the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas indicate that although both modalities can coexist without problems, virtuality poses greater demands in terms of self-regulation and time management. Similarly, research conducted in other countries has shown diverse results. In Bulgaria, for example, accounting

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students value the flexibility of virtual education, although they also experience challenges in terms of motivation and social interaction (Nedeva and Dimova, 2022).

In Latin America, the impact of the pandemic on virtual education has been even more evident. The Economic Commission for Latin America and the Caribbean (ECLAC, 2020) stresses that the region faces a deep digital divide, inequalities in access to technology and the need for greater teacher training to successfully implement online educational modalities. These barriers not only affect educational quality, but also deepen social disparities, especially among students in rural areas.

A crucial aspect that stands out in research on virtual education is the perception of quality that students have compared to face-to-face education. García and López (2018) indicate that although differences in academic performance are not always significant, students tend to perceive greater satisfaction with face-to-face interaction due to the direct contact with professors and peers. However, this scenario is changing as institutions improve their virtual platforms and adopt innovative pedagogical approaches that encourage participation and active learning in online environments.

Accounting education presents an additional challenge in terms of teaching practical skills. As Durán et al. (2015) point out, the assessment of practical skills is more limited in virtual environments, which requires the use of simulations and virtual laboratories to maintain the educational level. In addition, studies such as that of Muñoz and Heredia (2020) on the National University of Piura, confirm that the lack of face-to-face interaction affects students' perception of the effectiveness of virtual education, which may influence their academic performance.

This study aims to analyze and compare the learning outcomes in the virtual and face-to-face education modalities in accounting students of the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas, during the period 2020-2021. Through the evaluation of several variables, such as student satisfaction, their level of interaction, teaching strategies and academic performance, it seeks to provide a comprehensive view on the strengths and weaknesses of both modalities.

The importance of this analysis lies in the fact that accounting education requires not only theoretical mastery, but also the development of practical skills that are difficult to replicate in virtual environments without adequate resources. The findings of this study can contribute to the design of educational policies that promote the optimization of technological resources, continuous teacher training and the integration of pedagogical strategies that favor learning in both contexts.

Recent references have also highlighted the need to adapt to the new post-pandemic educational reality. Studies such as those by Bakoush (2021) on the use of learning-based simulations to improve the satisfaction of finance students, and by Albitres et al. (2023) comparing academic performance in virtual and face-to-face environments in Peruvian university students, show that it is possible to maintain a high academic level in virtual environments, provided that adequate teaching and assessment methodologies are implemented.

In summary, the post-pandemic context has generated a paradigm shift in higher education, especially in technical areas such as accounting. This paper seeks to contribute to the debate on the effectiveness of virtual versus face-to-face education, providing empirical evidence that allows higher education institutions to improve their pedagogical practices and ensure quality training for their students, regardless of the educational modality chosen.

Material and Methods

The present study uses a mixed methodological approach, combining quantitative and qualitative techniques to obtain a comprehensive view of the impact of virtual and face-to-face education on the academic performance of accounting students. This methodological approach allows not only to measure quantifiable results, such as grade point average, but also to explore the perceptions and experiences of students in both educational modalities.

Research Design

The design of this research is non-experimental and cross-sectional. It observes and analyzes the academic performance and perceptions of students at a single moment in time, without manipulating educational variables. According to Hernández et al. (2021), the non-experimental design is suitable for studies that seek to identify relationships between variables without intervening directly in the study phenomenon. In addition, the cross-sectional approach is ideal for obtaining a snapshot of the educational reality during a specific period, in this case, the 2020-2021 academic year.

Population and Sample

The target population of the study is composed of the students of the Professional School of Accounting of the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas, enrolled in the academic cycles of 2020 to 2021. In total, the population consists of 195 students, from which a stratified random sample of 98 students was selected, representing approximately 50% of the total population. According to Martínez (2020), stratified random sampling allows guaranteeing the representativeness of subgroups within a population, in this case, students of different academic levels.

The sample selection was performed using a confidence level of 95% and a margin of error of 5%, ensuring that the results are generalizable to the total population. This approach follows the methodological recommendations of authors such as Creswell and Creswell (2018), who highlight the importance of ensuring validity and reliability in sample selection in education studies.

Data Collection Instruments

A structured questionnaire composed of closed and open-ended questions was used for data collection. The closed questions focused on quantitative aspects, such as grades obtained in virtual and face-to-face courses, and the frequency of participation in learning activities. On the other hand, the open-ended questions were designed to explore students' qualitative perceptions of the effectiveness of both modalities, following the instrument validation guidelines proposed by Palacios et al. (2019).

The questionnaire was previously validated through an expert judgment composed of university teachers and pedagogical specialists. In addition, a pilot test was conducted with 15 students to adjust the wording and ensure the clarity of the questions. This procedure follows the recommendations of authors such as Bisquerra (2019), who suggest that content validity should be guaranteed by consulting experts in the area of study.

Data Collection Procedure

Data collection was carried out in two phases. In the first phase, the questionnaires were distributed virtually through the Google Forms platform, in order to facilitate student participation remotely. This modality is in line with new research methods in times of pandemic, where access to participants is often limited to digital means (Gómez and García, 2020). In the second phase, semi-structured interviews were conducted with a randomly selected subgroup of 10 students, with the purpose of deepening qualitative perceptions about teaching modalities.

Data Analysis

Quantitative data were analyzed using SPSS statistical software, version 27, using descriptive techniques and hypothesis testing. Measures of central tendency such as means and standard deviation were calculated to compare grade point averages between virtual and face-to-face courses. To determine whether there were significant differences between the two educational modalities, a test for independent samples was performed, as suggested by authors such as Field (2018) for comparative studies.

As for the qualitative data, the open-ended responses and interviews were analyzed through a thematic coding process. This approach allows identifying recurring patterns in students' perceptions, as well as exploring the strengths and weaknesses of both educational modalities. According to Miles, Huberman, and Saldaña (2019), thematic coding is an effective technique for analyzing large volumes of qualitative data in educational studies.

Ethical Considerations

The research followed the ethical principles established by the American Psychological Association (APA, 2017) and the Declaration of Helsinki. Informed consent was obtained from all participants, who were informed about the objectives of the study, the confidentiality of their responses, and their right to withdraw at any time from the research process. In addition, anonymization of the data was guaranteed, following the recommendations of authors such as Israel and Hay (2018) on ethics in educational research.

Results

The results of this study are presented in two main sections: first, the quantitative data obtained through the questionnaires applied to the students of the Professional School of Accounting, and second, the qualitative analysis of the semi-structured interviews. These results allow us to contrast the impact of virtual versus face-to-face education on academic performance and student perception during the period 2020-2021.

- *Academic Performance In Virtual And Face-To-Face Modalities*

The data collected reveal significant differences in the academic performance of students according to the educational modality. In virtual courses, the average grade was higher, with a mean of 15.6 (standard deviation of 2.1), while in face-to-face courses, the mean was 13.9 (standard deviation of 2.4). This difference was confirmed by a t-test for independent samples ($t = 3.75$, $p < 0.05$), indicating that students achieved better results in the virtual environment.

These results coincide with previous studies such as that of Nedeva and Dimova (2022), who found that students perceive virtual education as more flexible and efficient in terms of time management, which could explain the better academic performance in this modality. However, it should be noted that other studies, such as that of Ramírez et al. (2022) in Mexico, warn that virtual education may present challenges in terms of self-regulation of learning, which could negatively affect some students.

- *Perception On Interaction And Active Participation*

One of the key concerns in the transition to virtual education has been the loss of direct interaction between teachers and students, a factor that influences the learning process. In this study, 62% of respondents indicated that interaction in face-to-face courses is more enriching compared to virtual. However, 28% indicated that digital tools, such as forums and synchronous sessions, allowed them to maintain an acceptable level of participation in virtual classes.

Arbaugh et al. (2009) suggest that the success of virtual education depends largely on the implementation of pedagogical strategies that promote active interaction, which reinforces the findings of the present study. According to Mencia and Rivera (2022), the integration of collaborative activities and constant communication are essential elements to ensure active participation in virtual environments, a perception shared by 41% of respondents, who highlighted the importance of synchronous interactions through platforms such as Zoom and Google Meet.

- *Teaching Strategies And Feedback*

Feedback is a crucial component of learning, both in face-to-face and virtual environments. In this study, 52% of students considered that feedback was more effective in face-to-face courses, where direct contact with the teacher facilitated an immediate response to their doubts. However, 38% stated that feedback in virtual courses was equally useful, provided that efficient communication platforms were implemented.

These results are consistent with the findings of García and López (2018), who point out that the quality of feedback in virtual education is directly related to the use of appropriate technological tools and the level of teacher commitment. On the other hand, Bacaushi (2017) highlights the importance of continuous teacher training in virtual environments to ensure adequate and appropriate feedback.

- *Level Of Satisfaction And Academic Commitment*

In terms of overall satisfaction, 57% of the students were satisfied with the virtual modality, mainly because of the flexible schedule and access to online resources. However, 30% of the respondents expressed a clear preference for the face-to-face modality, arguing that the personal interaction and the traditional classroom environment foster greater concentration and commitment to the course.

This finding coincides with the results of previous research, such as that of Albitres et al. (2023), who found that students who attend face-to-face classes tend to feel more engaged due to the direct contact with their classmates and teachers. However, studies such as those by Sanchez and Ramirez (2022) show that virtual education can offer similar results as long as appropriate teaching methodologies are implemented and students have the necessary technological tools.

- *Factors Influencing The Choice Of Educational Modality*

The results of the questionnaire revealed that 48% of the students chose the virtual modality due to the flexibility it offers in terms of time and access to study resources. On the other hand, 35% preferred the face-to-face modality due to the perception of better teacher accompaniment and greater ease in resolving doubts.

These data suggest that the choice of modality is strongly influenced by contextual and individual factors, as also indicated by the study of Alvarado et al. (2022), who found that time flexibility and previous experience in virtual environments play a fundamental role in the students' decision.

Interpretation Of Results

The results obtained show a significant advantage of the virtual modality in terms of academic performance, but also highlight the need to improve interaction and feedback in these environments. Although students value the flexibility of virtual education, technological barriers and the lack of personal interaction are factors that affect the perception of teaching quality. According to recommendations from recent studies, the implementation of student-centered pedagogical strategies and the use of interactive technologies could mitigate these challenges and improve outcomes in both educational contexts (García and López, 2018; Mencia and Rivera, 2022).

Discussion

The results obtained in this study provide a clear view on the impact of virtual and face-to-face education modalities on the academic performance and perception of accounting students during the period 2020-2021. The findings show that while the virtual modality offers advantages in terms of flexibility and academic performance, the face-to-face modality is still preferred in key aspects such as interaction and

feedback. These results are consistent with previous studies conducted in different contexts and educational levels.

Academic Performance: The Advantage Of Virtual Flexibility

Analysis of the data reveals that students in the virtual modality obtained, on average, better grades than those in the face-to-face modality. This finding can largely be explained by the flexibility that virtual education offers students, allowing them to manage their time more efficiently, access online resources, and adapt the pace of their learning to their individual needs. Nedeva and Dimova (2022) also found that perceived flexibility in virtual education is one of the main factors contributing to higher academic performance, especially in technical disciplines such as accounting.

However, it should be noted that this higher academic performance in the virtual modality could be influenced by other contextual factors, such as the lack of exigency in the evaluation or the possibility of resorting to external resources during exams, which has also been pointed out by Ramírez. et al. (2022) in their study on virtual education in Mexico. Therefore, it is important that educational institutions design rigorous evaluation mechanisms that maintain quality and objectivity in both modalities.

Interaction And Participation: The Face-To-Face Advantage

Despite the benefits of virtual education, the results of the study show that students prefer the face-to-face modality when it comes to interaction and participation. Sixty-two percent of respondents indicated that interaction in face-to-face classes is more enriching, which coincides with previous research highlighting the importance of direct contact between students and teachers (García and López, 2018). In face-to-face environments, students have the opportunity to actively participate in discussions, receive immediate feedback, and develop social skills that are essential in the learning process.

This result highlights one of the main limitations of virtual education: the lack of personal interaction and the possible feeling of isolation among students. According to Bacaushi (2017), the quality of interaction in virtual environments depends largely on the technology used and the commitment of teachers to encourage active participation. However, despite technological advances and interactive platforms, virtual interaction is still perceived as less effective compared to face-to-face.

Feedback: A Key Factor For Educational Success

Feedback is another aspect in which students value the face-to-face modality more highly. Fifty-two percent of respondents indicated that feedback in face-to-face courses was more effective than in virtual courses. This result is consistent with the findings of Mencia and Rivera (2022), who found that feedback in virtual education tends to be less personalized and, in many cases, delayed. Students value the ability to resolve doubts immediately and to receive personalized guidance in face-to-face classes, which directly impacts their motivation and commitment to the course.

However, it is important to note that 38% of students state that feedback in virtual education was equally useful, suggesting that with adequate teacher training and the use of technological tools, it is possible to improve this aspect in virtual environments. . As García and López (2018) point out, the success of feedback in virtual environments depends on the ability of teachers to adapt to new technologies and their commitment to provide timely and detailed responses.

Satisfaction and Commitment: A Challenge for Virtual Education

Overall student satisfaction with virtual education was positive, with 57% of respondents indicating satisfaction with this modality. However, the face-to-face modality is still preferred by 30% of students, who emphasize that the personal interaction and classroom environment foster greater concentration and engagement. These results are consistent with those of Albitres et al. (2023), who found that, although

students value the flexibility of virtual education, the direct interaction and collaborative environment of the face-to-face modality are key factors for academic success.

It is therefore necessary for educational institutions to work on strategies that promote greater engagement and motivation in virtual environments. According to Ramírez et al. (2022), the design of collaborative activities, the use of interactive platforms and the integration of active methodologies can help improve the level of satisfaction and engagement in students who opt for virtual education.

Choice Of Educational Modality: Contextual And Individual Factors

The choice between virtual and face-to-face education is influenced by a variety of contextual and individual factors. Students who chose the virtual modality did so mainly because of the flexibility it offers, while those who preferred the face-to-face modality valued the personal interaction with teachers. These results are consistent with the findings of Alvarado et al. (2022), who point out that time flexibility and previous experience in virtual environments are determining factors in students' choice.

It is important to highlight that, although virtual education offers advantages in terms of accessibility and flexibility, it is not suitable for all students. Factors such as access to technological resources, self-regulation capacity and learning style significantly influence academic success in this modality (García and López, 2018). Therefore, educational institutions must offer options that adapt to the individual needs and preferences of students.

Conclusions

This study has allowed a comparative analysis of the effects of virtual and face-to-face education modalities on the academic performance and perception of accounting students at the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas during the period 2020-2021. From the quantitative and qualitative data collected, various strengths and weaknesses have been identified in each educational modality.

- *Improved Academic Performance In The Virtual Modality*

The results indicate that the academic performance of students in the virtual modality was significantly higher than in the face-to-face modality. This finding can be explained by the flexibility offered by virtual education, allowing students to better manage their time and access online resources. However, this benefit should be interpreted with caution, since the lack of exigency in some aspects of the virtual evaluation could influence the results obtained. It is necessary to implement rigorous control and evaluation mechanisms to ensure equity in both educational modalities.

- *Interaction And Participation: A Challenge For Virtual Education*

Although the virtual modality has advantages in terms of flexibility and access to resources, students value more positively the interaction and participation that occurs in face-to-face classes. Direct interaction with teachers and peers remains a key factor in the learning process, especially in disciplines that require the development of practical skills such as accounting. To improve the virtual education experience, institutions should encourage active participation through interactive technological tools and design activities that promote collaboration and exchange among students.

- *Effective Feedback Supports Face-To-Face Learning*

Feedback was perceived as more effective in the face-to-face modality, where students can resolve their doubts immediately and receive more personalized guidance. Although feedback in the virtual modality was also positively valued by a considerable percentage of students, this aspect must be improved to guarantee an equitable educational experience in both environments. It is essential

that teachers receive continuous training in the use of technological tools that allow them to provide timely and detailed feedback in the virtual modality.

- *Overall Satisfaction And Academic Engagement: The Importance Of Personal Interaction.*

Students expressed a higher level of satisfaction with the face-to-face modality, highlighting the personal interaction and the classroom environment as fundamental elements for their motivation and commitment to the course. However, the virtual modality was also positively valued for its flexibility, especially by those students who must reconcile their studies with other responsibilities. Educational institutions should seek a balance between both modalities, offering hybrid options that allow students to benefit from the advantages of each.

Recommendations For Improving Virtual Education

Based on the results of this study, the following recommendations can be offered to improve the quality of virtual education:

- *Encourage Active Interaction:* Institutions should implement pedagogical strategies that promote the active participation of students in virtual education, using technological platforms that facilitate communication and collaborative work.
- *Improve Feedback:* Teachers need to be trained in the use of technological tools that allow them to provide quick and personalized feedback in virtual environments, ensuring that students can resolve their doubts efficiently.
- *Design Rigorous Evaluations:* In order to maintain educational quality in the virtual modality, it is essential to implement evaluation mechanisms that ensure objectivity and fairness in the measurement of academic performance, reducing the possibility of students resorting to external sources during exams.

Final Conclusion

The COVID-19 pandemic has driven an unprecedented transformation in higher education, forcing institutions to rapidly adapt to the virtual mode. While this shift has proven beneficial in terms of flexibility and academic performance, it is clear that personal interaction and feedback play a crucial role in the learning process. The future of education is likely to be hybrid, combining the best of both modalities to offer a comprehensive educational experience that responds to the needs and preferences of students.

This study provides a solid foundation for future research on the effectiveness of educational modalities in post-pandemic contexts. It also provides recommendations for improving virtual education, promoting quality learning that prepares accounting students for the challenges of the labor market.

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