Online assessment in higher education during the COVID-19

La evaluación online en la educación superior durante el COVID-19

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ABSTRACT

The COVID-19 pandemic has accelerated the digital transformation of education, prompting universities worldwide to swiftly transition to online and blended learning environments. The adaptation process to online education varies depending on several factors, including the level of digitalization and technological penetration in each country, the availability of technologies at universities, and the digital skills of students and staff. Additionally, the specific field of knowledge influences the adaptation process, with differences observed between disciplines such as health sciences and humanities. In this study, we conduct an exploratory qualitative analysis on how universities have responded, specifically focusing on the coordinators of Master's programs in Spain in the specific area of assessment. This unprecedented situation has forced educators and institutions to rethink their assessment strategies and adapt to a new educational landscape. The insights gained from this study could provide valuable guidance for future crises and contribute to the ongoing discourse on the role of digital technologies in education in general, and in assessment in particular.

Keywords. Assessment, Digital Transformation, COVID-19, Integrity, Masters

RESUMEN

La pandemia de COVID-19 ha acelerado la transformación digital de la educación, llevando a las universidades de todo el mundo a realizar una transición rápida a entornos de aprendizaje en línea y mixtos. El proceso de adaptación a la educación en línea depende de diversos factores, como el nivel de digitalización y penetración tecnológica en cada país, la disponibilidad de tecnologías en las universidades, o las habilidades digitales de estudiantes y personal. Además, el campo específico del conocimiento influye en el proceso de adaptación, con diferencias observadas entre disciplinas como las ciencias de la salud y las humanidades. En este estudio, realizamos un análisis cualitativo exploratorio sobre cómo han respondido las universidades, centrándonos específicamente en los coordinadores de programas de máster en España en el área específica de evaluación. Esta situación sin precedentes ha obligado a educadores e instituciones a replantear sus estrategias de evaluación y adaptarse a un nuevo panorama educativo. Las ideas obtenidas de este estudio podrían proporcionar orientación valiosa para futuras crisis y contribuir al discurso en curso sobre el papel de las tecnologías digitales en la educación en general, y en la evaluación en particular.

Palabras clave. Evaluación, Transformación Digital, COVID-19, Masters

INTRODUCTION

The COVID-19 pandemic has served as a catalyst for the digital transformation of education. The COVID-19 pandemic has necessitated an urgent and immediate transition to online learning environments in universities worldwide. This shift has been guided by numerous institutions, including the Organisation for Economic Co-operation and Development (OECD), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the World Bank, among others (Area-Moreira et al., 2021). These organizations have provided recommendations to facilitate the adaptation of teaching to the new reality. According to UNESCO, the lockdown measures that led to the closure of educational institutions on April 20, 2020, affected 72% of the total enrolled students worldwide: 1.134.916.281 students could not continue their usual educational process (UNESCO, 2022).

However, the process of adaptation is not uniform and depends on several factors. These include the level of digitalization and technological penetration in each country, the availability of technologies at each university, and the digital culture and competencies of both students and staff in each faculty. Furthermore, the specific field of knowledge also plays a role in this adaptation process. For instance, the transition might look different in health sciences compared to humanities due to the nature of the subjects and the methods of teaching. Therefore, establishing a universal framework for action is not feasible.

A European Commission report that analyzed the impact of COVID-19 on higher education underscore the complex and multifaceted impact of the pandemic on higher education, emphasizing the importance of proactive measures and strategic planning to navigate the evolving landscape of education in the wake of COVID-19 (Farnell, Skledar & Šćukanec, 2021). The report highlights several key findings regarding the impact of COVID-19 on higher education in Europe:

1. Immediate Response to Crisis: Higher education institutions quickly transitioned to emergency remote teaching in response to the pandemic, with most institutions implementing successful online learning strategies (p.6).
2. Financial Challenges: COVID-19 has posed significant financial challenges for higher education, including major cuts in public funding, loss of tuition fees (especially from international students), and potential closures of institutions (p.59).
3. Impact on Underrepresented Groups: There is a concern that the pandemic may exacerbate educational inequalities, leading to decreased access and increased drop-out rates among underrepresented, vulnerable, and disadvantaged groups (p.59).
4. Opportunities for Transformation: The crisis has provided an opportunity for higher education to reflect on and improve its organizational and delivery methods. This includes accelerating transformation, adopting innovative approaches to online learning, and prioritizing the social dimension of education (p.59).
5. Need for Policy Responses: It is crucial for higher education institutions to receive support and resources to address the challenges posed by COVID-19 and drive innovative solutions for the post-pandemic recovery period (p.18).

This situation has impacted assessment at all educational levels. In this research, we carry out an exploratory qualitative examination to analyze the response of universities, with a focus on Master's program coordinators in Spain, particularly in the domain of assessment. The coordinator of a university master's program performs scientific, academic, and management functions. In their scientific role, the coordinator ensures the coherence of the master's content and verifies its scientific level. Academically, the coordinator is responsible for the academic monitoring of the degree and leads the accreditation and verification processes of the masters. In terms of management, the coordinator carries out internal academic management tasks within the master's and coordinates the degrees within the center to which the master's is attached (Universidad Complutense de Madrid, n.d.).

Several studies pointed out the significantly influence of COVID-19 in the educational sector, leading to several notable conclusions (Escamilla-Solano, Diez-Martin, Blanco-González & Fernández de las Peñas, 2023). Institutions swiftly transitioned to online learning platforms to ensure uninterrupted education, emphasizing the importance of digital tools and remote teaching methods. However, challenges arose in maintaining student engagement and retention, prompting the need for innovative strategies to boost participation. The pandemic highlighted the significance of digital education tools and resources, while also exposing disparities in access to technology, underlining the urgency to bridge the digital divide. Higher education institutions faced hurdles in managing academic programs and student services remotely, necessitating flexible management approaches. Furthermore, the pandemic exacerbated existing social gaps in education, underscoring the importance of inclusive practices. Universities implemented risk management strategies to ensure the health and safety of their communities, alongside exploring hybrid learning

models to offer flexibility. Overall, the pandemic accelerated the adoption of innovative teaching methods and flexible learning formats, compelling educators and institutions to adapt to the evolving educational landscape.

The extraordinary circumstances stemming from the pandemic have compelled educators and educational institutions alike to reevaluate their approaches to assessment. This process entails not only reassessing traditional methodologies but also embracing innovative practices to effectively navigate the challenges posed by the new educational landscape. The findings derived from this research hold the potential to offer invaluable insights that can guide educational institutions in navigating future crises effectively. This study contributes to the broader understanding of how digital tools can be leveraged to enhance teaching, learning, and assessment processes in both traditional and remote learning environments.

LITERATURE REVIEW

Within the dynamic realm of higher education, the widespread incorporation of technology has significantly altered conventional teaching methods. A noteworthy aspect of this transformation is the uptake of online assessment methodologies, which encompass a variety of tools and strategies including quizzes, exams, and interactive assignments facilitated through digital platforms (Garrison & Kanuka, 2004). Since the integration of ICT into education, online assessment methods have been evaluated to know their effectiveness (Afzal, Zia & Khan, 2024). Formative assessment is an important factor of online assessment, and entails a methodical approach to collecting evidence on student learning, employing this evidence to promptly adjust instructional strategies, and delivering continuous feedback to both students and instructors, all geared towards optimizing student learning outcomes and accomplishments (Popham, 2018). A literature review about the topic based on the analysis of 18 empirical studies conducted by Gikandi, Morrow & Davis (2011), found the following key concepts related to formative assessment in online and blended learning environments.:

1. Immediate and Ongoing Feedback: Online platforms enable timely formative feedback, aiding students in identifying strengths and weaknesses and refining their understanding, thus promoting engaged and self-regulated learning.
2. Engagement with Critical Learning Processes: Formative assessment in online settings facilitates engagement with critical learning processes, fostering deep learning, motivation, self-regulated learning, and the development of transferable skills.
3. Promotion of Equitable Education: Online formative assessment contributes to equitable education by offering diverse opportunities for dynamic interactions with teachers and peers, thus fostering collaborative learning communities.
4. Ensuring Validity and Reliability: Maintaining the validity and reliability of online formative assessment is crucial to supporting various learning needs and ensuring meaningful educational experiences through ongoing, authentic assessment activities, learner autonomy, effective feedback, and clear communication of learning goals.
5. Fostering Sustained Meaningful Interactions: Effective integration of formative assessment in online learning environments promotes sustained meaningful interactions among learners and teachers, facilitating the development of learning communities and supporting deep learning.
6. Technological Integration: The convergence of formative assessment with technological perspectives gives rise to online formative assessment, leveraging ICT to gather and analyze information about student learning, assess progress, and enhance further learning endeavors.

According to Elaine at al. (2024), the framework encompasses five key considerations for designing online assessments: ensuring academic integrity, providing quality feedback, supporting

a positive learning experience for students, ensuring the integrity of student information, and ensuring that all students have an equal opportunity to successfully complete the assessment. Additionally, authenticity was identified as an additional consideration through a survey of educators and discussions in focus groups. The text also highlights the complexity that the online environment adds to the design of quality assessments and the contextual factors that influence assessment design decisions.

Online assessment methods hold the potential for increased accessibility, flexibility, and immediate feedback, thereby enhancing the learning experience by making it more personalized and efficient (Anderson & Dron, 2011). Nevertheless, concerns persist regarding issues such as academic integrity, technological discrepancies, and the dependability of online evaluations (Rafiq, Kahdim & Afzal, 2023). To provide context for this examination, it is imperative to consider potential drawbacks of online assessment.

As a consequence of the COVID-19 pandemic, higher education institutions had to make a fast transition to online teaching and learning to ensure that students' participation and progress were not disrupted (Elaine et al. 2023) .Within this context of online assessment, the COVID-19 forces higher education institutions to transform their assessment strategies and norms in an imperative way. Online assessment has emerged as the predominant method of examination in institutions of higher education (Osabutey, Senyo & Bempong, 2024).

In the European Union, key aspects of assessment in the context of COVID-19 and its impact on higher education include (Farnell, Skledar & Šćukanec, 2021):

1. Academic Integrity: Maintaining academic integrity in assessments conducted remotely is a significant concern. Institutions are revising their policies to ensure fairness and prevent cheating in online assessments.
2. Quality Assurance: There is a need to define suitable quality assurance policies for online learning to address concerns about the effectiveness and credibility of remote education delivery.
3. Adaptation of Assessment Procedures: Institutions are exploring new methods of assessment to accommodate the shift to online learning, including providing clear guidelines to students, offering alternative forms of assessment, and conducting vivas for examinations.
4. Student Perspective: Understanding how students are adapting to the new learning environments and the challenges they face during the pandemic is crucial for designing effective assessment strategies.
5. Academic Integrity in Online Teaching: Ensuring academic integrity and maintaining assessment standards in emergency remote teaching is a key challenge that institutions are working to address.

These aspects highlight the importance of reevaluating assessment practices in higher education to ensure fairness, quality, and academic rigor in the face of the disruptions caused by COVID-19. Institutions are actively seeking innovative solutions to uphold academic standards while adapting to the new realities of remote learning.

The authorities in different countries have recommended or implemented various frameworks. For instance, Germany suggested the use of questionnaires within institutional virtual campuses (such as Moodle) and proctoring practices (González et al., 2020). Online proctoring programs (OLPs), also known as remote proctoring, typically denote the digital methods used to supervise and oversee student actions during examinations using webcams and internet connections, thereby thwarting and identifying any potential instances of misconduct (Dendir & Maxwell, 2020).

Austria and Belgium opted to postpone exams until the situation improved; France, in addition to considering postponement, proposed alternative forms of online assessment such as supervised task evaluation, questionnaires, use of video conferencing, and proctoring; Italy recommended the use of video conferencing and questionnaires via institutional virtual campuses (Moodle); Portugal

contracted and made available the Colibrí system (Zoom) to universities; and Sweden facilitated the use of the online assessment tool Inspera as some examples of measures taken in various European countries (González et al., 2020).

The CRUE (Conference of Rectors of Spanish Universities) articulated the response to Covid-19 to conduct online assessment in three main areas: methodological, regulatory (including aspects related to data protection), and technological (CRUE, 2020). In the case of Spanish universities, focusing the institutional response on assessment in higher education, recommendations are provided covering various systems to ensure the authorship of exams (González et al., 2020). The role of institutional virtual campuses becomes crucial, structuring both teaching and assessment, as well as proposing possible assessment methods such as oral exams and different types of assignments for continuous assessment (CRUE, 2020). Security and identity issues have also been addressed (Grande de Prado et al., 2021).

Considering previous literature review, we wonder how was perceived in Spanish Universities the transformation in assessment provoked by COVID-19 pandemic.

METHODOLOGY

To analyze the impacts of Covid-19 on the evaluation of master's programs in higher education, we adopted a qualitative methodology. This approach is often used in social sciences to explore behaviors, perspectives, feelings, and experiences (Brown, 2010). It provides a depth of understanding that quantitative data often lacks. In this study, it was used to understand the impacts of Covid-19 on the evaluation of master's programs in higher education. Gathering data through semi-structured interviews was done following Ibarra-Sáinz, González-Elorza and Rodríguez-Gómez (2023) recommendations. Semi-structured interviews are one of the most utilized methods for obtaining qualitative data in social sciences (Adams,2015; Bradford & Cullen, 2012). This method includes a set of question that enable the person being interviewed to articulate their perceptions and sentiments about a topic in their own language. The interviewer possesses a questions and checklist of subjects to discuss, but has the ability to modify the sequence or phrasing of inquiries based on the replies of the person being interviewed. This adaptability facilitates a more comprehensive investigation of the subject matter. This approach is instrumental in delving into the nuanced effects of the pandemic. They are particularly favored because they allow for an exploration of reality from a subjective perspective and offer an in-depth insight into individuals' experiences with a high degree of detail (Flick, 2009).

In this study, we conducted interviews with 33 coordinators of University Masters from five universities across three areas: education, economics, and communication. The distribution of interviews across different universities and areas of study can provide a more comprehensive understanding of the impacts of Covid-19. It allows for the identification of common themes and differences in experiences and perspectives across different contexts. This diverse group provided a comprehensive view to understand the multifaceted impacts better. The distribution of these interviews can be reviewed in Table 1.

Table 1. Distribution of coordinators interviewed by areas and university.

	Mangament & Economy Masters	Education Masters	Media & Communication Masters	Total
University of Cádiz	-	3	1	4
University of the Basque Country	5	6	3	14
University of Valencia	1	7	-	8
Universitat Rovira i Virgili	2	4	1	7
Total	8	20	5	33

All interviews were conducted via videoconference using the Microsoft Teams application. The interview conducted was aligned with the objectives of the FLOASS project (Ref. RTI2018-093630-B-I00, funded by Spanish Ministry of Science, Innovation and Universities, and the support of UNESCO Chair Evaluation and Assessment, Innovation and Excellence in Education). The overarching goal of this research is to provide a framework for action in Higher Education, supported by the use of Technology-Enhanced Assessment (TEA) and Learning Analytics (LA), to guide the design, implementation, monitoring, and evaluation of Learning Outcomes (LO) that require high student capabilities (FLOASS, 2022). The semi-structured questions were validated by the research team of the project. The interview protocol had 25 structured questions organized into 4 different thematic blocks. Within the thematic block of "Assessment: characteristics," the following 2 questions related to the situation caused by Covid-19 and its impacts were included:

12. Do you believe that this experience [online shift caused by Covid-19] will change the future use of technology for assessing student learning?

13. How do you think the use of the technological environment could be improved [post-pandemic] to enhance assessment processes in this Master's program?

To conduct the analysis, an inductive coding methodology was employed. Coding is a fundamental tool in qualitative research, and to ensure rigor, a prior transcription of the interviews should be carried out (Parameswaran, Ozawa-Kirk, & Latendresse, 2020). The methodology employed in our research involved recording interviews conducted via Microsoft Teams, which were subsequently transcribed. The analysis was exclusively performed on the transcriptions, with other variables such as expressions or paraverbal characteristics not included in the coding. The interview texts were analyzed using MaxQDA Analytics Pro 2020 version 20.4.2 software (MAXQDA, 2022), employing an inductive coding process.

Inductive coding refers to a data analysis process wherein the researcher reads and interprets raw textual data to develop concepts, themes, or a process model through data-driven interpretations (Chandra & Shang, 2019). This coding method typically relies on inductive reasoning, where important thematic areas emerge from raw data through repeated examinations and comparisons.

In conclusion, this study used a qualitative methodology and semi-structured interviews to explore the impacts of Covid-19 on the evaluation of master's programs in higher education.

RESULTS

The results proved the digital transformation of the evaluation processes is evidenced supported with expressions such as "*changing our mindset, as we are professors who come from a face-to-face context*" or "*not only do methodologies change, but also the perspective changes, everything changes*".

The shift towards digital methodologies and tools has been a significant aspect of educational adaptation during the pandemic. While many educational technologies were available and utilized before the onset of the pandemic, their adoption and utilization have experienced a profound acceleration and redefinition in response to the crisis. Prior to the pandemic, these tools may have been seen as supplemental or optional, but during the COVID-19 period, they have become indispensable components of the educational landscape. Teachers and educators have found themselves reevaluating and reimagining how they engage with these tools, incorporating them more seamlessly into their teaching practices. This evolution has not only reshaped the way education is delivered but has also prompted a fundamental reconsideration of the role and potential of digital tools in enhancing learning outcomes. Interviewees usually use sentences as the next one "*tools that perhaps, when we were in complete face-to-face mode and using a previous model, you did not use*".

Another result indicates that what initially seemed like a short-term response to the pandemic has, for many educational coordinators, transformed into a catalyst for enduring structural changes in teaching and assessment practices. The shift to online learning, initially driven by necessity, has forced educators to explore and integrate digital tools and methodologies into their instructional strategies in ways that were previously unimaginable. As coordinators reflect on this transition, they recognize that the changes implemented during this challenging period have not only facilitated continuity in education but have also uncovered new opportunities for innovation and improvement. Consequently, many anticipate that the adaptations made during the pandemic will have a lasting impact on the educational landscape, leading to a reevaluation and restructuring of teaching and assessment methodologies to better align with the needs and demands of contemporary learners. This change, which began as imperative and circumstantial to address the pandemic, is expected by most coordinators to result in structural changes in teaching and assessment, supporting such ideas with coordinator's reflection such as "*we are making this modification permanent*." Another coordinator views the transformation as having "*an effect, I understand, in the medium or long term*".

The change has been carried out with great effort from the entire educational community: institutions, administrators, teachers, and also, the students. The teaching staff has made a significant effort, as evidenced by statements such as "*it has been a challenge for teachers to update themselves, very specifically, in technology*" or "*teachers have struggled a lot with ourselves to transform due to the situation*". But for the students, according to the coordinators, it has also entailed a significant effort, especially in adapting to new methodologies: "*they find that they would need more hours to complete the work*" or "*the teachers post a capsule, a PowerPoint with voice, and then I don't know what else, a series of readings, 'you post too many readings, it's impossible to read all this.' They obviously also have to change their mindset because if we alone make the effort, it won't be effective*." Although students haven't struggled with digital adaptation in terms of tools, they have struggled with the transformation in methods: "*we've had to do a lot of pedagogy about this, it's not the same as a face-to-face class as a virtual class, it's very different and you have to understand that, of course, I can't just post a 5-hour video conference to explain*".

There has been evidence of the need for training regarding assessment in online environments: "*I think that often the problem with applying technological tools for assessment is that we need training, we need to know how it works*". The need for training in assessment in general and in

online environments in particular is significantly evident, although self-learning by coordinators and teachers has been a strategy that has allowed the acquisition and application of new teaching and assessment methodologies: "*we have done something like a condensed masterclass in a year, and from what I know so far, all teachers, to a greater or lesser extent, have applied more than one assessment method taken from that training and monitoring by the coordination*". Coordinators consider this self-learning to have been consolidated, representing a leap in the digital transformation of teachers: "*a lot has been learned, it has been a significant effort for teachers to update themselves very specifically in technology, but undoubtedly, COVID-19 has been decisive for that professional retraining that has been rushed since March 2020*".

Regarding technology, we highlight the role that Learning Management Systems such as Moodle or Blackboard have played in both teaching and assessment. This is one of the aspects most frequently mentioned by coordinators, followed by video conferencing equipment and software such as Google Meet or Zoom. LMSs have been given a pivotal importance: "*the use of Moodle has been greatly enhanced during the period of confinement, and it continues to be enhanced. As a coordinator, I am doing this for the first time, which I did not do before*" or "*there is no choice but to articulate everything through the Moodle platform because face-to-face interaction is not possible*".

In terms of assessment, the use of tasks for submitting assignments and for conducting multiple-choice tests is highlighted, as well as self-assessment, individual and group work, and peer assessment as some of the most employed strategies. We provide some examples highlighted by the coordinators: "*students are encouraged to reflect on their own work during the defense*"; "*such as in individual assignments, which are ultimately what is evaluated*"; "*we are starting to see the implementation of online exams*"; "*they evaluate each other in oral presentations and other tasks and activities*". Therefore, we emphasize that the use of the online platform and assessment tools and methods has been digitized, employing them more as a procedural tool rather than a methodologically transformative one.

Among other less frequent aspects in the interviews are competencies and learning outcomes, which are barely mentioned. We highlight a comment in this regard that emphasizes how the pandemic and the imperative digitization have caused "*the previous design that virtuality has forced us into to lead to a much more refined focus on learning outcomes*". Surprisingly, aspects related to academic integrity such as cheating and fraud in evaluation tests, and student identity, are hardly addressed. There are barely three comments across all interviews: "*well, they all copied*" and "*we know that this type of technology or online assessment is used, but it will have consequences, and what we need to do is to find procedures to prevent that fraud*". We also note, although it has not been one of the most frequent factors in the interviews, the factor of age and type of teacher as barriers or accelerators to transformation. Older teachers tend to have less knowledge about teaching transformation and evaluation systems: "*the younger teachers have had somewhat more specific training on this topic because for those of us of a certain age, these are concepts that were not taught*". It is also noted that part-time professors, due to their lower dedication, have encountered more problems and resistance in adaptation: "*but encountering a part time professor, for whom I don't blame, who already have a lot on their plate, is also a factor, because these people are working and have very busy schedules... What can you explain to them about Moodle or whatever? This is something we encountered*".

DISCUSSION

Assessment during the COVID-19 pandemic has led to significant shifts in higher education. One discussion factor is the **sustainability of these changes beyond the pandemic**. It has been observed that almost all higher education institutions adapted rapidly to online learning and teaching, including assessment methods. Our research found that many of these changes will

persist after the pandemic, consistent with other studies that have shown online assessment emerging as the predominant method of examination in institutions of higher education (Osabutey, Senyo & Bempong, 2024). The crisis has provided an opportunity for higher education to reflect on and improve its organizational and delivery methods. This includes accelerating transformation, adopting innovative approaches to online learning, and prioritizing the social dimension of education (Farnell, Skledar & Šćukanec, 2021).

Another critical consideration is the **training** provided to faculty and staff to effectively navigate the digital transformation of assessment. Our results indicate that faculty members required substantial support and professional development to transition to online assessment methods successfully. Similar recommendations can be found in other studies and reports, such as Farnell, Skledar & Šćukanec (2021:18). It is crucial for higher education institutions to receive support and resources to address the challenges posed by COVID-19 and drive innovative solutions for the post-pandemic recovery period.

The **digital transformation** of assessment not only necessitated changes in methodologies but also in the nature of content delivery. Educators had to reconsider the types of content suitable for online assessment, ensuring alignment with learning objectives and the capabilities of digital platforms. Findings from Gikandi, Morrow, and Davis (2011) indicate that the convergence of formative assessment with technological perspectives gives rise to online formative assessment, leveraging ICT to gather and analyze information about student learning, assess progress, and enhance further learning endeavors amidst the digital transformation.

Ensuring the **integrity of assessments** conducted remotely presented a significant challenge during the pandemic. Institutions had to implement measures to prevent cheating and maintain academic integrity, such as proctoring software, plagiarism detection tools, and robust authentication processes (González et al., 2020; Elaine et al., 2024). Upholding integrity in online assessment was crucial to preserving the credibility and validity of academic credentials (Farnell, Skledar & Šćukanec, 2021). Surprisingly, in our interviews, it was not a frequent topic, whereas in previous studies, integrity is a main discussion topic. Only 3 comments were made in the 33 interviews regarding integrity.

The pandemic also highlighted the **diverse profiles of faculty members** and their varying levels of digital proficiency. Some educators seamlessly adapted to online assessment, leveraging their technological skills and pedagogical innovation. However, others encountered challenges due to limited digital literacy or resistance to change. Addressing the diverse needs of faculty members and providing tailored support was essential for the successful implementation of online assessment practices. Receiving support and resources is crucial for higher education institutions to address the challenges brought about by COVID-19 and to implement innovative solutions for the post-pandemic recovery period (Farnell, Skledar & Šćukanec, 2021). Age, which could be related to technology proficiency, was not found to be a relevant factor in our research. The adaptation and transformation effort to adjust to the pandemic and the technological environment was a common factor stressed by most interviewees.

In terms of **evaluation methods**, institutions explored a range of approaches to assess student learning in virtual settings. Traditional exams were supplemented with alternative assessment methods, including project-based assessments, peer evaluations, and online discussions. Educators had to adapt their evaluation strategies to ensure alignment with learning outcomes and the constraints of online learning environments. Student perspective is a relevant factor in both our results and other studies (Farnell, Skledar & Šćukanec, 2021)

Technological tools played a pivotal role in facilitating online assessment processes. Institutions adopted learning management systems (LMS), video conferencing platforms, and assessment software to administer exams, provide feedback, and monitor student progress. The selection and integration of appropriate technological tools were critical factors in ensuring the effectiveness and efficiency of online assessment practices.

The institutional recommendations made by coordinators focus on the use of virtual campuses and their available tools, such as online quizzes, as well as other video conferencing tasks (González et al., 2020). These recommendations are aligned with the results of our analysis, in which we found that they have been a fundamental tool for structuring both teaching and assessment. Regarding specific training to transform education through digital tools by faculty, we found differences between the importance attributed in the recommendations, which only indicate it as a recommended practice (CRUE, 2020), compared to the results of our analysis, which consider it a fundamental strategy for successfully implementing the necessary digital transformation in assessment imposed by COVID-19. Regarding systems to ensure the authorship of exams, we found that despite the importance given to them in the institutional reference documents (González et al., 2020), in the interviews conducted, we hardly found any references in this regard, not resulting in a limitation and/or concern for the development of evaluative tests. Assessment methodologies have also been aligned, recommending test-type assessments on the campus, and other types of assignments in the virtual campus for continuous assessment. Finally, it is necessary to highlight that factors such as interaction, feedback, reliability, integrity, accessibility, or flexibility (Elaine at al., 2024; Anderson & Dron, 2011; Farnell, Skledar & Šćukanec, 2021), were not found in our research.

CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

In conclusion, assessment during the COVID-19 pandemic prompted higher education institutions to undergo a significant digital transformation, impacting various aspects such as sustainability, training, content delivery, integrity, faculty profiles, evaluation methods, and technological tools. it is essential for institutions continue refining their online assessment practices to meet the evolving needs of students and educators in a digital age. Institutions had to invest in training programs to equip educators with the necessary skills and competencies to design, administer, and evaluate assessments in virtual environments.

Findings highlight the need to enhance training in competency assessment in general, and in technological environments in particular. We also emphasize that although many of the practices employed during the pandemic will cease to be used, many others will already be integrated as common practices, so we can affirm that the pandemic has aided in the digital transformation of assessment. Aspects of identity, security, and privacy require further study and awareness-raising actions to gain the necessary importance from the perspective of faculty.

Another relevant factor that should be considered in future assessment strategies is efficiency and data-driven insights. Utilizing online assessments can significantly optimize the grading workflow for educators, affording them invaluable time savings. This efficiency enables educators to channel their energies towards furnishing students with robust feedback and tailored support, thereby enhancing the learning experience. Online assessment tools frequently yield data that can be used for analysis, furnishing educators with invaluable insights into prevailing student performance patterns. These analytics empower educators to discern trends, facilitating targeted interventions and personalized learning experiences tailored to individual student needs. By leveraging these insights, educators can proactively address areas of weakness, optimize instructional strategies, and cultivate an environment conducive to academic growth.

The findings from this study can provide valuable insights for educators, policymakers, and researchers in understanding and addressing the challenges posed by the pandemic in the context of higher education.

The work presented has significant limitations. It is framed within the FLOASS project and does not constitute an investigation focused on the aspect of adapting assessment to Covid-19. The number of questions has been very limited, so the results should be interpreted with caution. It is an inductive exploratory study that allows us to understand the basic aspects to address the digital

transformation of assessment during the pandemic. Further research it is required, being essential to evaluate their long-term viability and effectiveness. Assessing the sustainability of these changes involves examining factors such as infrastructure, resources, and institutional commitment to maintaining digital assessment practices beyond the pandemic.

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CRediT AUTHOR STATEMENT

All authors have contributed equally to all parts of the work.