COVID-19 AND DISTANCE ASSESSMENT AND EVALUATION MODELS IN HIGHER EDUCATION

COVID-19 E MODELOS DE MEDIÇÃO E AVALIAÇÃO À DISTÂNCIA NO ENSINO SUPERIOR

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Resumo. The COVID-19 pandemic has posed enormous challenges to society. Various measures are being taken in higher education as online classes can be expected to persist for several months. However, the question of evaluation arises for which many institutions are not prepared. This perspective aims to explore various models and practices of formative and summative assessment and evaluation that can be adopted in the context of e-learning. Furthermore, it intends to identify a set of good practices and challenges that can be identified in the process of migration to the e-learning model. This study is relevant in the practical dimension for higher education institutions to adopt new approaches for monitoring and evaluating the activities developed by students in the e-learning environment.

Palavras chave: COVID-19; e-learning; evaluation; assessment; distance learning.

Abstract. A pandemia da COVID-19 tem colocado enormes desafios à sociedade. Várias medidas estão a ser tomadas no ensino superior, uma vez que se pode esperar que as aulas online persistam durante vários meses. Contudo, coloca-se a questão da avaliação, para a qual muitas instituições não estão preparadas. Esta perspetiva visa explorar vários modelos e práticas de avaliação formativa e sumativa que podem ser adotados no contexto do e-learning. Além disso, pretende identificar um conjunto de boas práticas e desafios que podem ser identificados no processo de migração para o modelo de ensino de e-learning. Este estudo é relevante na dimensão prática para as instituições de ensino superior adotarem novas abordagens de monitorização e avaliação das atividades desenvolvidas pelos estudantes no ambiente do e-learning.

Keywords: COVID-19; e-learning; avaliação; medição; ensino à distância.

INTRODUCTION

Since the emergence and expansion of COVID-19, students from universities around the world are at home and attending university in a distance learning model. This model has been a challenge for universities, faculty, and students. Many universities had only experience classroom teaching and this new model constituted a novelty and a challenge to be overcome. Furthermore, and to increase this challenge, the process of implementing distance learning had to be implemented in a short time to avoid harming student learning and teaching activity.

The evolution of distance education has been remarkable. Technological evolution has opened new opportunities and ways of creating, developing, and offering pedagogical content in diversified, attractive, and innovative formats. Furthermore, Naidu (2017) notes that forms of interaction and communication are structured differently, involving dynamic and alternative processes characterized by flexibility of space and time. In this context, Tucker & Morris (2010) consider that distance education has evolved from the traditional concept supported by distance to a learning model that can be carried out at "any time" and at "any pace".

Non-presential education has become an appropriate option in light of the increased demand for training and the consequent decrease in resources. It can also be an invaluable option to ensure access to education in remote areas or in the context of a pandemic as occurred with COVID-19. However, joining distance learning courses just because it is the most advantageous modality in terms of schedules and the absence of travel may be too reductive. As Serdyukov (2017) recognizes, distance education requires a move away from traditional pedagogical models and the introduction of differentiated pedagogical approaches appropriate to its audience, in which technology is a facilitator for the development of knowledge by students at their pace and style.

Distance education is supported by a two-way communication technology system. This model replaces the personal teacher/student contact, as the preferred means of teaching, by the systematic and joint action of several didactic resources and the support of an organization and tutoring. West (2009) states that this model fosters independent and flexible learning by students. According to O'Neil (2005) distance learning

is characterized by the following central elements: (i) separation of teacher and student in space and/or time; (ii) control of learning is more focused on the student than on the teacher; and (iii) communication between students and teachers is mediated by technological elements.

Distance learning has an independent learning component and for this reason is strongly dependent on the didactic design of the materials (Borges et al., 2014). Furthermore, it should offer complementary mechanisms to replace the current interactivity between the student and the teacher in a conventional classroom model (Souza & Polonia, 2015). In this sense, the classroom model that existed before the emergence of COVID-19 should not simply be replicated for the distance model, in which the same teaching approach and materials are used. This is a clear challenge for teachers who need to adapt very quickly to a new reality.

One of the challenges posed in distance learning is concerning the implementation of an evaluation model (Lara et al., 2020; Markova et al., 2017). The models based on classroom teaching were particularly focused on summative assessment through the performance of written assessment tests. However, in this phase with the closing of the classroom activity in universities, several questions emerge, such as: Can the same classroom evaluation model strategy be adopted? Should the adoption of formative evaluation methodologies be encouraged as a complement to the summative dimension? What are the best evaluation strategies in distance education? What are the best practices and challenges posed by migration to e-learning?

This study seeks to answer the above questions through a critical analysis of distance assessment processes. For this purpose, several alternatives are compared considering their relevance for higher education institutions. A qualitative exploratory study was adopted in which the authors explore the challenges and best practices of implementing a distance assessment model considering four dimensions as proposed by Groen & Eggen (2020) such as formative assessment, formative evaluation, summative assessment, and summative evaluation. Finally, a set of good practices and challenges that are posed to higher education institutions, teachers, and students are identified. This study aims to contribute to a positive experience for all these actors in distance learning at this time of COVID-19, and to ensure that students continue to be evaluated in a balanced, impartial, and fair manner.

DISTANCE ASSESSMENT MODELS

The paradigm about the evaluation methodologies in distance learning, around the aspects of efficiency and effectiveness, is a theme of continuous discussion in the academic environment. COVID-19 times have strongly stimulated educational institutions to carry out, in a short space of time, massive migration from its classroom teaching activities to the methodological process of e-learning in distance learning. According to Schoepp (2019), higher education issues related to the teaching and learning process tend to be guided by parameters related to the students' learning results, impacting the definition of the assessment process itself and the curricular structure of the courses in their form and content.

Cerezo et al. (2020) note that most of the literature on distance learning is concentrated on the students' performance results. However, it is shown to be insufficient in the amount of effective information about the implementation of the students' knowledge assessment process in distance learning environments, both in the formative assessment approach and in the summative assessment. Among the challenges of assessing learning in distance learning, we have as a relevant aspect the question of credibility in the evaluation process, that is, when considering a teaching environment in which teachers and students are not physically present in the same place. One challenge is related to seeking efficient methods of monitoring students, mainly in assessments carried out thorough tests using the computer in e-learning.

Alonso-Díaz & Yuste-Tosina (2015) carried out a specific study with students on their evaluation process, using research tools as questionnaires, interviews, and focus groups. This study concluded that videoconferences, implemented with the sharing of video between teacher and students, are fundamental and effective in guaranteeing the credibility of the evaluation process, both in formative and summative assessment. They favor to some extent, the feeling in students of the real presence of the teacher, even if virtually, reducing the tendency of impersonality in communication, in addition to allowing better monitoring of student behavior during classes and the evaluation process itself.

The implementation of formative assessment, with individual and/or group activities, in a Virtual Learning Environment (VLE), tends to prove to be especially relevant in distance learning. It stimulates interactivity between student/student and student/teacher, whether in synchronous or asynchronous moments of the class (Comerford et al., 2018). Additionally, it contributes to avoiding isolation in the virtual

room of the most introspective students encouraging them to participate more actively in the activities. Moreover, it enables the teacher to check the behavior and performance of students during the course, which will allow mitigating the distance, facilitating the teacher to verify more assertively the evolution of students' learning.

The realization of continuous formative assessment will help the teacher to carry out more accurate monitoring of the students through the best feedback that is generated (Miranda & Hermann, 2015), than just concentrating on a summative assessment, directing much of the content of the subject in the application of a single online test. By intensifying in distance learning the use of continuous formative assessment, added to the summative, the teacher tends to potentiate the teaching-learning process, carried out (if necessary), adjustments and course corrections in the transmission of matter and knowledge more efficiently and assertively. Miranda & Hermann (2015) advocate that this approach generates a positive increase in students' learning.

In the development of tests supported by digital technologies such as those used in VLE, it is necessary to reflect critically on the objective intended with the assessment, in order to plan in a coherent way the type of test intended and then, dimension it appropriately, around the desired purpose around the chosen evaluation model, either formative or summative. Groen & Eggen (2020, p. 15) present a generic practical classification about some possible approaches for the elaboration of tests in different evaluative contexts, either in the measurement of the students' learning, as well as in the quality of the teaching-learning process, as we can see in Table 1.

Table 1. Characteristics of test approaches.

	Test administration purpose	**Test length**	**Level**	**Report**		
				Scope	**Report measure**	**Precision**
Formative assessment	Assessment: Enhance learning and instruction	Preferably short tests because testing is often frequent	Individual or class	One or multiple narrow domains or skills	Ability estimate, score, or indicator for each domain	Low at the individual level
Formative evaluation	Evaluation: Make decisions about the quality of programs or schools	Short tests because aggregated results are used	Program or school	Multiple very broad domains	Distribution information based on ability estimate, score, decision, or indicator for each domain or for the entire test	Low at the individual level because results are aggregated, high at the higher level
Summative assessment	Assessment: Make a decision about mastery of a domain or admission	Long test acceptable for high-stakes testing, short tests acceptable for low-stakes testing	Individual	One or multiple broad domains	Requires a mastery decision, ability estimate, score, or indicator for each domain or for the entire test	Low for lowstakes testing, high for highstakes testing at the individual level
Summative evaluation	Evaluation: Make judgments about schools or educational systems	Short tests because aggregated results are used	School or one or more educational systems	Multiple very broad domains	Distribution information based on ability estimate, score, or indicator for each domain	Low at the individual level because results are aggregated, precise at the level of interest

In the context of formative assessment, in addition to the intrinsic objective of assessing students 'learning, teachers need to monitor the evolution of students' skills over the course. Cerezo et al. (2020) developed an algorithm called "Inductive Miner", which uses process mining techniques implemented in a VLE. This algorithm was applied in a university course during the period of a semester, as the students (n = 101) used the resources multimedia made available while carrying out their self-directed learning in an e-learning regime. The main objective was to observe the students' skills in handling the various multimedia resources made available in the VLE, to realize whether the students who obtained a better performance, were those who followed the guidelines provided by the teachers, for the resolution of the assessment activities. The result of the analysis of the algorithm logs showed that most of the approved students were those who followed the guidelines indicated by the teachers for the use of the resources made available in the VLE, mainly in the use of multimedia resources that involved collaborative learning.

When analyzing the paradigm around formative and summative assessment, we observe in the scientific literature a wide discussion about which would be the best evaluation method. Houston & Thompson (2017) refer that, for some time, formative assessment was considered as a best practice for assessing learning, because it is closer to the evolutionary process of student knowledge and for allowing more accurate feedback than assessment models that tends to be distant and does not follow the gradual learning process of students, which tends to be enhanced in distance education.

Korpi (2019) considers high-risk to concentrate the evaluation process of the students 'learning only in summative evaluations or even in the application of intermediate assessment, as these do not represent, by themselves, an ideal process of continuous monitoring of the students' learning. Additionally, summative evaluations tend to increase stress in students. On the contrary, a formative assessment process enables students to engage in study, due to the need to continuously present the results of the evolution of their learning during the entire period of classes, which tend to increase the degree of impersonality between teachers and students for various reasons, due to physical distance, failures technologies, lack of audio and video sharing between teachers and students, personal aspects, etc. However, the implementation of a formative assessment process is not without risks and difficulties. Kasani et al. (2020) report several difficulties in its implementation in higher education, such as weaknesses in technological infrastructure resources, the lack of adoption of other formative assessment tools that can help motivate students to learn, and weaknesses in the discussions and feedback given to students that should be richer and more personalized. At this level are proposed the adoption of complementary strategies approaches like the adoption of serious games which will enhance the engagement of students for learning (Almeida & Buzady, 2019).

BEST PRACTICES AND CHALLENGES

The pandemic effect caused by COVID-19 and the consequent removal of the academic community from the physical environment of universities and schools intensified in a short time the academic debate around the best practices to be adopted for distance learning. However, this theme that has been discussed for a long time, but which in the present times has acquired a strong role, is accompanied by a set of practices previously known by the academic community, uncertainties, and experiments about the implementation of distance learning.

Olasina (2018) carried out a study in Africa with higher education students (n = 2718) to understand which factors positively impact the teaching strategies adopted in e-learning, to find indicators that allow viewing aspects to reach the best practices in the distance learning teaching and learning process. Part of the results of the investigation, as we can see in Table 2, indicate that factors such as the implementation of collaborative activities, interactivity between students and teachers on multiple digital platforms, in addition to VLE, such as on social networks and discussion forums and the sharing experiences that use real-life scenarios of students inserted in school activities, are considered good practices in the learning process of students in distance learning.

Table 2. Best practices of e-learning

S/N	Practices	Frequency	%
1	Full immersion interactivity levels using customized audio/video, multimedia, and simulation	661	24.3
2	Students share real-life scenarios, experiences, stories, graphics, visuals & games to engage one another	883	32.5
3	Students' creation of multiple forums such as online discussions & Facebook pages to ask questions, share experiences and interact	1019	37.5
4	Domestication – students use local languages (Zulu, Afrikaans, Xhosa & Venda) to communicate using the learning system and social media	771	28.4
5	Students self-created e-learning support in small groups	507	18.7
6	Embedment of e-learning into social contexts of students	402	14.8
7	Students took ownership of stored resources on their storage facility on the learning system	115	4.2
8	Self-evaluation	556	20.5
9	Empowerment of students – spontaneity of learning via Blackberry tools (BBMs)	298	11
10	Collaborative activities	1142	42
11	Control – student can test their knowledge at their own time	115	4.2
12	Personalized learning	392	14.4

The implementation of distance learning supported by digital resources is accompanied by a series of challenges that go beyond issues related to teaching and learning methodologies and their good practices.

Torres et al. (2017) highlight that higher education institutions have a very complex environment composed of the diversity of courses, disciplines, and educational levels. Several important factors contribute to the implementation of an e-learning environment, such as the increase in the digital literacy of teachers and students and the availability of hardware, software, and telecommunications resources. However, other challenges arise when we migrate from Face-to-Face (F2F) education to e-learning, such as the risk of the inadequacy of the adopted teaching models, difficulty in integrating the curriculum of the courses, lack of ability of teachers and students with digital technologies, and the absence of assessment processes suitable for distance learning.

Vershitskaya et al. (2020) refer that internal university management is a fundamental aspect of the proper implementation of e-learning programs, which aim to achieve the best quality indexes in their educational programs. This factor evolves financial, planning, and strategic definition issues broad. However, for a better perception around the educational policies of higher education institutions, it is necessary to carry out more in-depth studies on the management of higher education institutions. Regarding the process of implementing distance learning and the resulting appropriate development of learning assessment instruments, as a starting point, we must take into account the following challenges: (i) factors hindering the implementation of e-learning; (ii) inadequate ICT and e-learning infrastructure; (iii) financial constraints; (iv) lack of affordable and adequate Internet bandwidth; (v) absence of operational e-learning policies; (vi) absence of technical skills on e-learning and e-content development by the academic staff; (vii) lack of interest and commitment among the academic staff to use e-learning; (viii) amount of time required to develop e-learning content; (ix) problems associated with the organization of webinars and virtual classes; and (x) other issues.

Finally, blended learning is a major trend in education in the coming years, in which a mix between in-class learning and online learning proposals is promoted. The model focuses on investing in digital forms to aid the interaction between students and teachers in the classroom. Faraniza (2021) argues that with the sophistication of the tools of the online environment, teachers must appropriate novelties to make education and access to knowledge more agile and attractive. This is a model that intends to capture the interest of young people used to the use of new technologies in their daily lives, but also adults to facilitate the combination between their professional activity and academic valorization. This model brings new challenges such as the need to consider different models of administrative-pedagogical organization of courses that contemplate the flexibility of time and space, methodologies that provide greater interaction and dialogue between the actors of the educational process, teaching resources and materials in different media, pedagogical mediation through technologies (Namyssova et al., 2019). Another difficulty is pointed out by Gikandi (2021), in which a model of integration of online formative assessment and teaching presence is proposed that allows the implementation of hybrid assessment models in the context of blended learning.

CONCLUSION

COVID-19 has led to a rapid and unprecedented migration from the F2F model to online education. This was a demanding challenge particularly for educators with lower digital literacy who were reluctant to move away from the proven techniques based on the F2F model. COVID-19 launched higher education institutions into a massive pedagogical experiment, forcing the adoption and evaluation of new approaches. Several assessment and evaluation models were proposed considering their formative and summative dimensions. Despite the relevance of both, the role of continuous formative assessment stands out to enable more individualized monitoring of students' work. This is a key element to ensure the motivation and involvement of students throughout the learning process.

Several best practices can be identified for the operation of e-learning as offering highly immersive and personalized activities. This can be achieved by adopting multimedia elements, stories, or real-life scenarios. The appeal for collaborative activities in small groups with students is another factor that promotes greater interactivity between students and the teacher. However, several challenges emerge mainly in a scenario of unplanned and rapid migration to the e-learning model, such as the difficulty of integrating activities in the curriculum of the courses, lack of technical infrastructure, low adaptability of teaching practices, and the lack of mechanisms to assess the functioning of distance learning.

This study provides mainly practical contributions by exploring the challenges posed by COVID-19 to assessment and evaluation models in higher education. Good practices and challenges experienced by higher education institutions in the migration of F2F education to e-learning are also discussed. As future

work, it is intended to develop an empirical study to explore with higher education institutions the practices and models that have been adopted in the formative and summative assessment components.

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