ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 15, Issue, 06, pp. 68668-68673, June, 2025
https://doi.org/10.37118/ijdr.28710.06.2025

RESEARCH ARTICLE OPEN ACCESS

ONLINE TEACHING CHALLENGES IN HIGHER INSTITUTIONS IN MOZAMBIQUE: FUTURE RECOMMENDATIONS

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ARTICLE INFO

Article History:
Received 17th March, 2025
Received in revised form
20th April, 2025
Accepted 19th May, 2025
Published online 30th June, 2025

Key Words:

Online teaching; Challenges; Technology; Recommendations.

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ABSTRACT

Currently, due to the coronavirus-19 pandemic, online teaching is implemented in many higher education institutions in Mozambique. However, this teaching modality has faced several challenges in the teaching and learning process. In this sense, this article aims to present the results achieved with the completion of a doctoral research on the analysis of distance learning models in private and public universities in Mozambique. In terms of empirical research, a mixed methodological approach was adopted, following a case investigation strategy. Two instruments were used for data collection: document analysis and questionnaire. All questionnaires were applied online. 317 students, 6 professors, 8 tutors and 6 managers from a private university and a public university were involved. It was concluded that the challenges imposed on teachers, tutors and students are directly linked to the lack of mastery in the use of technology, the poor quality of the internet and the lack of financial conditions on the part of students. It is hoped that the results achieved will enable a critical reflection on strategies and policies for the implementation of online education in Mozambique.

Citation*: *Wanna, W. O., Simões, M. D. F. D. J., & Silva, S. M. D. 2025. *"Online Teaching Challenges in Higher Institutions in Mozambique: Future Recommendations". International Journal of Development Research*, 15, (06), 68668-68673.

INTRODUCTION

The Severe Acute Respiratory Syndrome pandemic caused by the Coronavirus-19 (COVID-19) led Humanity to a set of physical contact restrictions that reached the sphere of education, mainly in the continuity of the face-to-face education model, at all levels of education in many countries of the world. However, despite the fact that school institutions were physically closed, this was not synonymous with the necessary interruption or cancellation of teaching and learning activities between teachers and students. On the contrary, the teaching and learning movement, in almost all countries and respective school levels, continued and, we believe, it was decisive for them to overcome the pandemic. The unexpected situation, which led to the abrupt interruption of classes in educational institutions, required them to make quick and correct decisions, without taking timely steps to ensure that distance education initiatives were, in a guaranteed way, well-succeeded. Steps such as planning, training everyone involved, preparing the technological infrastructure (hardware and software), automating administrative activities, preparing the data collection system, adapting or reformulating curricula, in addition to promoting inclusion and equity, and even the necessary adaptation of the design of the classes (properly speaking) in terms of resources, activities, strategies, etc., were outdated. Apart from that, "*acting in urgency and deciding in uncertainty*" was the key expression for teachers who embraced "remote teaching" through the tools they had at their disposal (from a technological point of view), to continuepromoting contact, communication and following up on the defined didactic-pedagogical planning process, in face-to-face teaching terms, for and with their students. However, some higher education institutions have not suffered "much" this impact of "*acting in urgency and deciding in uncertainty*" in their educational realities, insofar as, with the massification and diversification of access to higher education, they have emerged in recent years, new approaches and supply of courses not only in the face-to-face teaching modality, but also in the distance learning modality. The COVID-19 pandemic did not catch them by "surprise". This fact was verified in many countries and, specifically, in Mozambique. This article focuses precisely on presenting two Mozambican higher education realities that, even before the COVID-19 pandemic, had made efforts to reflect on the importance of pedagogical issues and pedagogical innovation in the design of learning choreographies in Virtual Learning Environments (VLE). This investigation is preceded by a literature review rooted in distance education dimensions that enhance the identification of strengths and weaknesses associated with the dynamics experienced or intended to be implemented in a given institution.

LITERATURE REVIEW

The different forms of learning through Information and Communications Technology (ICT) are defined in the literature by various terms, such as web, computer, virtual environment, online (Guri-rosenblit, 2005). In this paper, all forms of learning through ICT are called online. Therefore, distance learning can be implemented online, using web technologies to support the teaching-learning processes, and to facilitate interactivity between the students

and the teachers in the teaching and learning process (Almeida & Silva, 2011). The Online Model (OM) can be implemented in two ways: synchronous and asynchronous (Miller & King, 2003). The synchronous form resembles a traditional model in which the teacher and the student are physically present in class at the same time. The only difference is that in the OM, the teacher and the students may be distant, but connected through technological resources such as: Skype, videoconference, or web conferencing. In contrast, in an asynchronous modality, the students learn in their places, at their own time and at their own pace. In other words, the students are the controller of their own learning but respecting the defined time of the program. That is the main reason why the distance learning model should always take into consideration the characteristics of the students (Cartelli, 2006; Wanna & de Jesus Simões, 2021). According to Machado (2001), the online model offers many advantages, such as: (1) the students can access online anywhere, without being limited to a physical space and geographical barriers, and at any time, without having to comply with a weekly class schedule; (2) there is no introductory problem of using the OM because many people already use the browser and surf the internet; (3) this model can reach virtually an unlimited number of people and, (4) it is a low-cost model because travel and accommodation expenses can be substantially reduced.

Nowadays, the OM attracts the attention of many critics and researchers about its effectiveness, methodology, flexibility of time and space, forms of communication and interaction between the students and the teacher in the process of teaching and learning (Almeida & Silva, 2011). Based on arguments presented by these authors, it is believed that the OM (the use of certain technologies) gives credibility to distance learning. However, not all educational centres or universities implement technology in the same way (Cartelli, 2006). From this premise, it is also believed that the online model is not exempted from disadvantages and criticisms. For examples: the use of the web information can bring several difficulties to the students. The difficulty of information on web is associated with the phenomenon of being lost in the space during a research; the use of technology contributes to the exacerbation of inequalities in education systems and it is not easy to control the learning pace of each student from a distance. It is believed that the day-to-day challenges of Online Teaching (OT) can only be overcome with a good management model, thus requiring greater dedication, commitment, and responsibility on the part of those who are involved in this modality. In this context, many authors claim that, in OT, managerial actions should focus on three dimensions: technological, administrative, and pedagogical. (Petter, 2010; Peres & Pimenta, 2016).

TECHNOLOGICAL DIMENSION

The technological dimension includes all the technological infrastructure (hardware and software) that supports the Virtual Learning Environments - VLE (Peres & Pimenta, 2016) and, consequently, the respective technological tools available in or through them. According to Almeida and Silva (2011), the focus of this dimension is on the design and application of multimedia resources as support tools for the respective dynamics associated with the teaching and learning process. This symbiotic relationship between technology and pedagogy, through educational design, is fundamental in the development of pedagogical skills in teachers and in building digital artifacts in students. By concentrating teaching and learning activities in VLE, we find the appropriate "ecosystem" for technology to enhance learning (Casanova, 2014) and to be a real motive and engine for the development of new online teaching and learning methodologies rooted in the social constructivist paradigm.

With regard to the importance of communication tools, Almeida and Silva (2011) emphasize that the dissemination of knowledge through electronic infrastructure constitutes an invaluable tool in supporting education, whether fully online or hybrid. It is, therefore, the technological dimension that guarantees the creation of software or systems; the functioning of the technological infrastructure and, the operation and maintenance of technological means (Petter, 2010; Silva et al., 2017), essential to the operationalization of the teaching and learning process itself in VLE contexts.

ADMINISTRATIVE DIMENSION

With regard to the administrative dimension, this refers to issues or tools that affect the organization and functioning of the institution, such as: partnerships and agreements; selection of human resources; dissemination of information; evaluation of the work of human resources (Petter, 2010; Silva et al., 2017). Therefore, the proper functioning of the distance education model also depends on administrative matters, such as maintenance of infrastructures, disclosure of institution rules and procedures, among others. It is in this perspective that Koponen (2006) argues that despite the importance of the technical aspects of virtual learning environments, they are unlikely to be useful if they are not well managed in institutional terms and, as we will see below, also in pedagogical terms. It can also be said that the success of the distance education modality does not depend only on the technical tools, but above all on the structural organization and institutional management.

PEDAGOGICAL DIMENSION

Over the last two decades, and specifically in higher education, the pedagogical core has been gradually moving from a pedagogical model of teaching centred on the teacher and his knowledge to a teaching and learning process more centred on the individual, as a student., considering their skills, potential and limitations and the skills they have to promote and improve within the scope of the course they are attending (Almeida & Silva, 2011; Peres & Pimenta, 2016). It is the constructivist paradigm that supports this discourse and that is rooted in the premise that the student learns through the symbiotic and dialogical relationship that he establishes and promotes between what he apprehends at a given moment - acquiring information - and his acquired knowledge and experiences - accommodating the information (Piaget, 1976) and, at the same time, he/she also learns from the possibility of debating this new knowledge with his/her colleagues and teachers, what Vygotsky (1980) calls social constructivism. In fact, looking specifically at the online context, the student is - by inherent profile - a subject necessarily with an active posture in accessing and acquiring, developing and producing knowledge. Recent studies show the urgency of promoting educational designs that encourage active learning (Casanova, 2011; Moreira, 2020; Casanova, 2014; Kim; Hannafin, 2011) and that they also guide the design of learning in a way that the students understand not only the importance of their role, what is expected of themselves as students who learn, what activities they have to develop, how much time they have to develop them and how they will be evaluated, among others. In a nutshell, a student is expected to be an "autonomous agent";to develop and enhance the acquisition of the most diversified skills, such as time management; excellent communication; computing and information technology; organization and management of information.

One of the most glaring fallacies used by detractors of digital education is that it boils down to the placement of content on distance learning platforms and that the teacher has a reduced role in the whole process. This means that students can develop their learning path, autonomously, almost as "aimlessly or adrift". The teacher recognizes that the process of transporting materials, made available in a face-to-face context, in a "blind" way to a virtual classroom is redundant and obsolete, especially at a time when the student can easily and quickly obtain more credible and updated information at the distance of a "click". Therefore, the learning scenarios are designed in many hours of "behind the scenes", not only in the selection and creation of didactic-technological resources, but also in the selection of individual and collaborative strategies of interaction with others and with the contents (Almeida & Silva, 2011; Peres & Pimenta, 2016; Morrison et al., 2019). The other critical situation is that the teacher

assumes himself or herself as the "vault stone" of online learning, as a single fundamental element in this teaching and learning process, even as a "scenario architect" of learning activities, not so much as a facilitator. Digital education takes us to a set of scenarios that will generate different learning choreographies that guide the student to enhance the acquisition and development of the most diverse skills.

RESEARCH METHODS

The article presented here, which aims to discuss the challenges of online teaching and the potential of dimensional management, falls within the scope of a doctoral thesis, entitled: "Analysis of Distance Learning Models of Private and Public Universities in Mozambique: A comparative case study". It was a comparative case study associated with the study of multiple cases as a methodological research strategy (Yin, 2015), with a quantitative-qualitative methodological approach.

Data Collection: In this research, four highereducationinstitutions were contemplated, namely: *Universidade Eduardo Mondlane (UEM), Universidade Maputo (UM), Universidade Católica de Moçambique (UCM) e Instituto Superior de Ciências de Educação à Distância (ISCED)*.But in this article, only data from UEM and ISCED are presented and discussed, as they are the only institutions that implement the fully online teaching model. The research participants were students, teachers, tutors, and managers of these institutions. Regarding the sampling aspects, the research included a total of three hundred and thirty-seven (337) in the two institutions mentioned above. Three hundred and seventeen (317) were students, six (6) were professors, eight (8) were tutors and six (6) were managers. The data collection instruments used were documental analysis and questionnaire. The questionnaires were applied online, using the Google Forms tool. Regarding the documental analysis, several documents were analysed with the objective of understanding the management of the virtual learning environment of each institution taking into account the pedagogical, technological and administrative dimensions.

Data Analysis: For the statistical treatment of quantitative data, this research used the program called Statistical Package for the Social Sciences – SPSS, version 25 and Google Forms. As for the treatment of qualitative data, the technique of content analysis was applied, ensuring the confidentiality of the information collected.

RESULTS

In this section, the intention is to present the strengths of digitaleducation that can be transformed into great opportunities for success, and the threats or challenges that can be overcome only with a goodmanagement model of the respective dimensions presented above. The results are shown in Table 1 below.

DISCUSSION OF RESULTS

As mentioned in the literature review section, dimensional management is considered as a great strategy for detecting successes and problems in online teaching. Therefore, in this section, we discuss about the opportunities and challenges of online learning, identified in the three dimensions mentioned above. It was noticed that both ISCED and UEM implement the fullyonline teaching model. The answers obtained indicate that sixty-five percent (65%) of the students feel more involved with this model. It was noted that this model was more preferred by "young adults" from 25 to 34 years old and adults from 35 to 64 years old, because most of those people who adhere to this model are workers, and do not have time. enough to attend in the blended-learning model. Furthermore, this model was highly praised by most teachers, tutors and managers for its enormous flexibility in terms of study schedule; existence of Study Resource Centres (CRE), ease of communication and feedback to students through platforms. Evidently, these results, in addition to several potentialities, can prove that this is the model of "salvation" of educational systems that grew rapidly during the period of the COVID-19 pandemic, transforming ways of teaching and learning. However, the fully online teaching model does not completely escape the disadvantages, criticisms and threats. The CREs, which are also considered as "poles" for investment and development of distance learning, are located in urban areas. The creation of CRE in areas that already have sufficient conditions for distance learning is a strategy that affects the expansion of this modality, "depopularizes" education and does not knock down elitist walls (Carr-Chellman, 2005). This observation is reinforced by empirical doctoral research carried out in Mozambique by Brito (2010). He noted the weak expansion of distance education across the country, specifically in rural areas. In the same line of critical thinking, Mota (2009), quoted by Netto, et al., (2010), shows that universities are located in large urban cities, which considerably restricts the access of a significant portion of the population to higher education. It should be noted that the distance education modality has existed in Mozambique since 2002, but until now, it has not expanded to all districts of Mozambique. The online teaching model, despite being a more preferred model by "young adults" and adults, and being positively evaluated by some teachers, tutors and administrators, is quite challenging because the number of students per class is high, the schedules for carrying out of tests or exams are not very flexible, and there are problems of low enrollment and dropout caused by various internal and external factors, such as:

1) **Lack of financial conditions**: Participants claim that one of the reasons for low enrollment and evasion has been the lack of financial conditions to cover enrollment and tuition fees. These findings also match the results presented by Tresman (2002); Shannon and Bylsma (2006), when they confirm that the economic factor is a frequent reason for students to drop out their studies in distance learning.
2) **Illness**: Currently, the COVID-19 pandemic has dictated evasion. The study carried out by Shannon and Bylsma (2006) also confirmed that illness in the family has been indicated as a determining factor in student dropout.
3) **Lack of teacher commitment**: Some teachers and tutors were unable to properly monitor students, provide desired real-time feedback, and publish test results.
4) **Poor command of ICT**. There was a lack of ability to use ICT on the part of the students. The literature also states that difficulty in using technological resources is the problem and it is associated with dropout and poor quality of teaching (de Almeida, 2008; Terry, 2001; Silva, 2017; da Silva & da Rocha, 2020).
5) **Poor internet quality or network fluctuation**: The internet quality was poor, slow and unstable. The study carried out by de Almeida (2008) also confirmed that some students in Brazil abandoned their distance learning courses, due to the poor quality of the internet. Therefore, as the internet is the main tool of the online teaching and learning, the poor quality of internet makes such a model unfeasible for the majority of the Mozambican population.

Regarding the places where students usually study, the results show that the internet is accessible anywhere.This means that the educational institutions that implement the fully online teaching model have one more opportunity to maximize their pedagogical activities across the country. These results reveal that online teaching takes place in a different place from face-to-face teaching, thus giving a lot of freedom to choose time and places (Fazenda &Amadeu, 1985). The online teaching is advantageous because it allows education to be accessible anywhere, without being limited to a physical space (Machado, 2001). As for the technological resources that students use to participate in pedagogical activities, the answers obtained refer to the computer, laptop, tablet, mobile phone, internet, Moodle platform, email, virtual library, WhatsApp, zoom and skype. These results confirm the statement made by khan (2005), cited by Peres and Pimenta (2016), when he argues that distance education is interactive teaching (…), using the most varied digital technologies.

Table 1. Common online teaching opportunities and challenges at ISCED and UEM

Pedagogic Dimension		**Technological Dimension**		**Administrative Dimension**	
Strengths	Challenges	Strengths	Challenges	Strengths	Challenges
65 (61%) students of UEM and 106 (50%) students of ISCED were satisfied with the provision of feedback	Overwork of tutors and teachers	Existence of a virtual library	Insufficiency of technological infrastructures for distance learning	Online enrollment	Low payment of tuition fees during the pandemic
High qualifications of tutors and teachers	Inadequateteachingmaterials	Existence of a platform	Media used not up-to-date	Methods of payingfees	Non-economiconline teaching model
Existence of studycentres	Weak student participation in the forum	Use of various technological tools	Poorquality of internet		Weak partnership policy with local companies
Adaptation of the online teaching model	Dropping out of school	Access to the website	High cost of the Internet, laptop, mobile phone for research		Lack of decent remuneration for tutors, managers, and teachers Student
Engagement in online learning	Poor location of study centres	Good online service	Poor command of information and communications technology (ICT)		Highenrollment rate
	Low flexibility in carrying out tests or exams	Provision of courses synchronously and asynchronously	Low level of training about distance learning model.		Absence of crucial information in the virtual learning environment
	High number of students per class		Lack of mastery of platforms		
	Difficulties in designing the test instruments for online exams				
	Lack of commitment of some teachers/tutors				
	Low students' performance				

Table 2. Future recommendations for online teaching in higher institutions in Mozambique

Dimensional Management of Digital Education	Future Recommendations
PedagogicDimension	1) 1) Psycho-pedagogical training specialized in electronic learning pedagogy in the two aspects of: a) Teachers Training: ❖ Psycho-pedagogical currents that support digital education; ❖ Web Design of virtual learning environments; Interaction and communication in digital environments with a focus on the specificity in writing and interpersonal communication in non-face-to-face contexts; ❖ Digital tools at the service of differentiated, interactive and socio-constructive learning activities and methodologies; ❖ Creation of digital didactic-pedagogical content; ❖ Learning assessment, placing the student as a builder of their own learning artifacts. b) Training of students: ❖ Specifics of student role performance; ❖ Navigability in virtual learning environments; ❖ Interaction and communication in digital environments with a focus on the specificity in writing and interpersonal communication in non-face-to-face contexts; ❖ Technological domain of different digital tools. 2) Contemplate the hybrid teaching modality (Synchronous and Asynchronous Learning) for rural areas. 3) Develop research through the design of scholarships and/or research.
TechnologicalDimension	❖ Creation of a stable, secure, free internet network for all agents in the educational community. ❖ Establish a partnership policy that allows students and teachers to be provided with a portable internet network for access outside the university building and respective resource centres; ❖ University model apologist for the idea that "technology depends on methodology and not the other way around".
AdministrativeDimension	❖ Creation of digital academic services model that provides administrative, financial support or other pedagogical secretariat nature. ❖ Establishment of more flexible academic calendars that take into account the specific constraints of access to the internet network. ❖ Expansion of the network of resource centres to all districts in Mozambique. ❖ Creation of a more economical distance learning model from the point of view of the fee charged to the student.

However, the main feature of the online teaching model is the use of the internet for sharing and managing data (Almeida & Silva, 2011). It is evident that the poor quality of the internet negatively contributes to the quality of distance learning. The success of distance learning does not depend only on the use of sophisticated technological resources, but also on administrative matters. That is why, the enrollment and registration public notices were consulted, with the aim of understanding whether distance education is low or high cost for students. It was found that in UEM the monthly fee varies according to the course. Students pay 6,250.00 *meticais* for the degree course in Business Management and 5,500.00 *meticais* for the degree courses in Education Organization and Management and Public Administration. While for ISCED, the monthly fee is the same for all courses. Then, it was necessary to compare tuition fees with minimum wages in Mozambique. The data show that the highest minimum wages are found in financial services, and in large companies and industries ranging from 5,000.00 *meticais* to 12,760.18 *meticais* per month. While low minimum wages are found in the Public Administration, Fisheries and Agriculture sectors, which vary between 4,266.68 *meticais* and 5,370.75 *meticais* per month (https://www.trovagas.com/blog/salario-minimo-em-mocambique/).

The online teaching model seems to be more expensive for most workers, compared to the face-to-face teaching modality. Naturally, the cost of courses places the online teaching model at a "competitive disadvantage" in relation to other higher education modalities. This may be one of the reasons why most unemployed young people with no financial conditions do not adhere to distance education in Mozambique.

FINAL CONSIDERATIONS

Though the distance learning modality is becoming increasingly popular worldwide, serious problems or effects have been reported to arise when the relationship or matching between distance Learning models and the students' characteristics is relatively neglected in the teaching and learning process (Wanna & de Jesus Simões, 2021). It is concluded that, the pedagogical dimension and the technological dimension affected the quality of teaching and learning due to the lack of mastery in the use of technology by some students, teachers and tutors, and the poor quality of the internet. Both the technological dimension and the administrative dimension were directly connected to the low enrollment rate and school dropout. It is, therefore, vital to pay attention to these three dimensions when implementing the distance learning models The time has come to make other considerations to close this article. It is up to us, based on the discussion of results presented, to enunciate a set of premises that allow us not only to turn challenges into opportunities, but also "act in an emergency" and decide in uncertainty", thus a basis for reflection that generates research and guidance for future action.Therefore, as a result of this work, we summarize the futurerecommendations for online teaching in higher institutions in Mozambique in Table 2. In closing, there is a need to invest in a comprehensive view of pedagogy in the online context that integrates technology to support teaching and learning (Carrillo & Flores, 2020) and in teacher training, namely, with regard to teaching methodology, nature of pedagogical interaction and assessment of learning in online environments, as well as considering the internal and external factors that affect students' predispositions and motivations for online learning.

Declarations

Competing interests: On behalf of other authors, the corresponding author declares that there is no conflict of interest.

Authors' contributions: All two authors contribute to the manuscript in terms of design, methodology, data collection, data analysis, interpretations, writing, and revising. The two authors read and approved the final manuscript

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