



# Blended Teaching Strategy in the Post-COVID-19 Period in Moroccan Universities

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**Abstract.** The COVID-19 pandemic has had a major impact on all areas, hence the need to think about a mandatory change on almost all levels including educational practices. In order to limit the spread of the virus, distance education was adopted, but faced several challenges. This experience has shown that although digital technology represents a lever for education, it can in no way replace the interactions between the teacher and his students and between the students themselves. Hence the need to adopt blended learning models to benefit from both the technology and the human dimension of education. This paper aims to describe the blended learning model that was adopted by Moroccan universities for the 2020/2021 academic year. Our research involves three major universities that receive a large number of students each year and already have a solid infrastructure. The experience has shown the potential of blended learning to face the problem of massification affecting Moroccan universities, engage students, and improve learning especially under the sanitary conditions imposed by COVID-19. The study also presents the challenges of blended learning with development perspectives for a successful hybridization in the Moroccan context.

**Research Contribution:** Improving education requires research in pedagogical practices and innovative solutions such as blended learning/teaching. This research gives an overview on hybridization, which seems an innovative solution to face the challenges of higher education, make education more accessible and increase student satisfaction. Development perspectives were proposed to successfully adopt hybridization to improve education in Morocco.

**Keywords:** Blended learning · COVID-19 · models · distance education · higher education

## 1 Introduction

### 1.1 E-Learning in Morocco

Nowadays, technology plays a crucial role in our daily lives, which incites professionals, educators and learners to rethink their traditional practices by making technology a lever

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for education for the redesign or reengineering of the education and training system. E-learning refers to a set of learning environments that are characterized by “the use of multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services, as well as exchanges and collaboration at a distance” [1]. It can complement face-to-face learning and can be considered as an alternative to traditional education [2].

Morocco has put in place strategies to consolidate the integration of technologies in its governmental strategies [3] in order to make it one of the emerging countries in the field of information technology and communication including E-learning.

Over the past two decades, higher education in Morocco has been tending towards creating and providing online access to course materials, by diversifying the education offered by universities and higher education institutions through new media and the Internet, such as learning management systems (LMS), asynchronous remote education, and online classes, among a myriad of other developing educational technologies.

In this sense, many Moroccan universities have started pilot experiments in e-learning by relying on multi-level integration approaches, based on both open virtual spaces (MOOCs), like Cadi Ayyad University (UCA) [4], Abdelmalek Essaadi University [5], the National School of Business and Management in Tangier [6], Ibn Tofail University [7] Mohammed V University and University Hassan II [8, 9], and hybrid methods (Blended learning).

## 1.2 Context of COVID-19 and the Launch of Distance Education

On March 11, 2020, the WHO [10] officially declared COVID-19 a global pandemic, with more than 121,000 cases reported. The world has been driven to an exceptional state with equally important repercussions at all levels. 165 countries have closed schools until March 2020, according to UNESCO which represents almost 1.5 billion children and youth (87% of the world's school population) [11, 12]. Morocco in turn has not been immune to this effect. To face this health crisis, the Moroccan authorities have taken the necessary initiatives to limit the spread of the virus among learners. The Ministry of National Education, Preschool and Sports (MENPS) has announced the suspension of classes until further notice from March 16, 2020, in all schools, public and private (MENPS press release - March 16, 2020) [13]. Like many countries, Morocco has opted for distance education to mitigate the loss of school time, ensure pedagogical continuity for about 10 million students in the twelve regions of the country, and maintain educational services.

As for the higher education sector, universities have electronic platforms that allow students to follow courses delivered by professors at a distance [4, 14,–9]. From Wednesday, March 25, 2020, the broadcast of courses and lectures was launched on the television channel “ARRIADIA” and radio stations (SNRT Radio) to facilitate access to courses, with a coverage rate between 80 and 100. Teachers, for their part, have started to post videos on their YouTube channel or schedule Facebook live to interact with their students and explain their lessons.

### 1.3 Problems Faced by Educators in E-Learning Practices During the COVID-19 Pandemic

Sidi Mohammed Ben Abdellah University in Fez explored the challenges it faced in its online distance education experience. The study found that teachers did not receive adequate training on how to adapt to this unexpected situation [15]. A study conducted in 15 Moroccan universities with 3037 students and 231 professors enrolled in different stages of higher education programs, which aimed to investigate the limitations of online learning platforms during coronavirus containment, showed that the main challenge faced by educators is the lack of technical support and training in the use of technological tools. Some teachers are not pedagogically trained in online teaching [16]. A study conducted at Cadi Ayyad University also showed that both educators and students encountered problems mainly related to technology during distance education [14]. Another challenge faced by educators is the lack of motivation and interaction between them and their students. Distance education presents a set of challenges for educators, namely adaptability to ICT, lack of social interaction in real life, frequent problems with technological tools and access to the Internet, lack of belonging to the classroom community, demotivation and low student engagement. Ibn Tofail University conducted another study to assess distance education at Moroccan universities in the COVID-19 era. The results have shown that distance education may not succeed if teachers and students are not sufficiently trained and familiar with technological tools and ICTs [17].

This forced shift to digital technology has proved to be a real boost to the digitalization of education and prompts a rethinking of post-COVID-19 education and pedagogical practices, especially in Moroccan universities. This unprecedented experience demonstrates that digital technology, even if it is a lever for education, cannot replace the rich interactions between the teacher and his students and between the students themselves. This is why it was necessary to adopt models based on blended learning (combination of digital learning and face-to-face) [18, 19], which seem to be a promising alternative to traditional models.

This study aims to answer the following questions:

- *What strategy for post-COVID-19 education?*
- *What are the strengths and challenges of blended?*
- *What measures should be taken to achieve successful hybridization in the Moroccan context?*

The main objective of this study is to shed light on the benefits of blended learning Moroccan institutions were adopting and its potential to improve higher education, highlight some of the challenges posed by hybridization and the measures to be considered for a successful blended learning in the Moroccan context.

We will discuss some case studies and models of distance education the most appropriate for higher education in our context. Finally, this paper will end with a conclusion.

## 2 Method

The start of the academic year and the 2020/2021 academic year has been heavily impacted by the Covid-19 crisis. In this section, we will describe the scenario adopted by some Moroccan universities in order to ensure a safe education for the 2020/2021 academic year. Our research concerns three major Moroccan universities, those that receive a large number of students each year and have a solid infrastructure and rich digital resources, with the aim of analyzing their experiences in delivering education in the post-Covid-19 period.

The “hybrid mode”, which combines face-to-face and distance learning [19, 20], has been adopted for the fall semester, based on the requirements of equity and quality and taking into consideration the particularity of each type of institution, each type of course and each teaching module.

As for Cadi Ayyad University (UCA), the majority of courses have been delivered remotely since November 2, 2020 on the E-campus platform. Each of the 14 faculties of UCA has its own E-campus platform (Fig. 1).

Face-to-face classes took place on November 9, 2020. A large part of the courses was provided remotely via the E-campus platform dedicated to each faculty. Thus, students were able to consult the courses in different formats (video, PPT or PDF), and to do tutorials on the platform. The professors used synchronous communication tools



Fig. 1. UCA e-campus platform.



Fig. 2. UM5 e-campus platform.



**Fig. 3.** Links to access the platforms of the UIT institutions.

(virtual classrooms: Microsoft Teams, Google Meet, WebEx, Jitsi Meet, etc. and video conferencing) with their students: ([UCA CAMPUS Numérique - \(دبيع عن الدروس - UCA CAMPUS Numérique\)](#)).

Regarding the Mohamed V University in RABAT (UM5), the different platforms (Fig. 2) have been offered to the university institutions via the link: ([Ressources Pédagogiques Numériques | MOHAMMED V UNIVERSITY IN RABAT \(um5.ac.ma\)](#)).

For institutions with regulated access:

- Lectures, tutorials and practical work were taught in a hybrid mode by dividing students into small groups;
- Possibility of doing the practical work at a distance, either by recording or by online simulations via specialized platforms (for example: G-Suite, Microsoft, Moodle: UM5MOOC);

For open access institutions - Basic studies degree courses:

- Lectures were at a distance;
- Tutorials and practical work have been organized in hybrid mode by dividing the students into groups (face-to-face group and other remote group(s)) with an alternation between groups;
- Possibility of doing the practical work at a distance either by recording or by online simulations via specialized platforms;

The faculty of sciences of the UM5 had made available to their students a Moodle platform proposing all the courses for each level and each field via this link: ([Bienvenue sur la plateforme Moodle-FSR \(um5.ac.ma\)](#)).

The Ibn Tofeïl University (UIT) has also opted for this hybrid format. As shown in Fig. 3, the 8 faculties of the UIT, each has its own Moodle platform: ([Ressources pédagogiques - Université Ibn Tofeïl \(uit.ac.ma\)](#)).

The results are obtained from preliminary analytical results on all the LMS platforms dedicated to each university, and from the statistics communicated on the official websites of each of these universities.

### 3 Results and Discussion

To ensure the online part of hybridization, universities have produced a variety of educational resources. As for the UCA, each faculty of the university has produced several resources in different formats (PDF, video, PPT...) as shown in Fig. 4. Since the Faculty of Sciences (FS) is the leader in digitalization of education in UCA, it has been the most productive in terms of production of digital resources with the Faculty of Sciences and Technologies (FST).

For UM5 in RABAT, the university already has a Digital Learning Center, one of whose missions is to capitalize on know-how in the design of flexible courses for hybrid and/or distance learning and to provide continuous training to teachers in ICT and distance education. The teachers have used the Moodle platform to ensure the online part of the hybridization, as well as the OpenEdx Mooc platform (Table 1). To ensure synchronous communication with their students, create and distribute courses and exercises, the learning platform Google Classroom has been used.

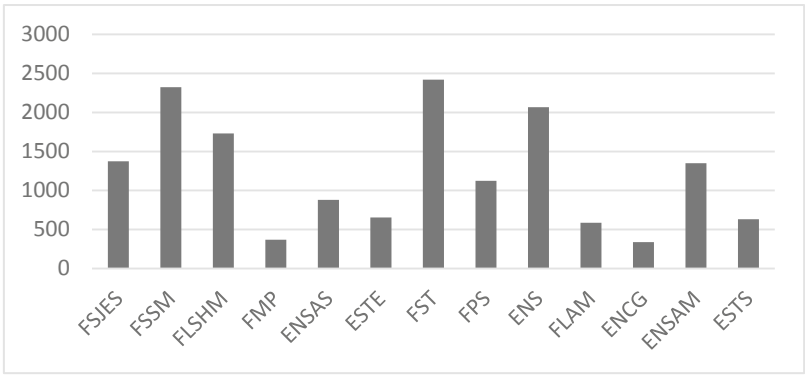


Fig. 4. The resources produced by different faculties of the UCA for online education [14].

Table 1. Statistics of the use of different tools: UM5 [21].

Tool	Statistics
Google Classroom	13000 registered 8060 students 135 classes 58 teachers
Moodle platform	15467 registrations 435 courses 226 teachers
OpenEdx MOOC	225 registrations 2 courses 2 teachers

**Table 2.** Statistics of the use of Moodle platform: faculty of sciences of UIT [22].

Tool	Statistics
Moodle platform	26937 users 411 courses 2762 activities

The UIT of Kenitra has provided its students with the educational platform Moodle (Table 2), which offered a wide range of activities: consulting documents (PDF, PPT, etc.), completion of online exercises, participation in forums, chat, video conferencing in real time etc.

Various educators and researchers have proposed blended learning as an optimal solution for delivering instruction, at least for a post-pandemic period of a few months. The forced recourse to hybridization was due to the prohibition of gatherings due to the sanitary conditions of the COVID-19 especially in the learning conditions within Moroccan universities. Each year, Moroccan universities receive a large number of students, especially in open access institutions. The physical places available remain insufficient compared to the number of registered students. The number of students has reached 989,899 with a total capacity of 521,187 places for the academic year 2020/2021 [23]. Apart from COVID-19 and its repercussions, this massification phenomenon has an absolutely negative impact on learning. This hybridization experience was a suitable solution both to ensure education under health conditions imposed by COVID-19 as well as to take advantage of hybridization to cope with massification. Fully distance education remains a fairly adequate solution to this problem, but poses a set of challenges for students and educators in terms of tutoring and support. The president of UIT has pointed out that when distance education was launched at the time of confinement, it was found that for regulated access, the connection rate was very high, sometimes up to 90%, this is due to the fact that the students are sufficiently equipped, monitored and easy to manage, since their number was small, which was not the case for open access institutions, with more than 4000 students for some levels, which made the monitoring of these students a rather difficult task. A study conducted at the UIT showed that 82.86% of the students participating in the study emphasized the need for pedagogical support in the appropriation of the courses set up on the platform [24]. Hybridization makes it possible to better manage the large number of students by alternating distance and face-to-face sessions. The face-to-face sessions contribute to better follow the students and to provide them with the support they lack in the totally remote learning. A lot of research has proven the effectiveness of blended learning in large classes [25–27]. Snowball [28] has cited the benefits of blended learning for large classes, namely:

- Provide content for different learning styles and paces that would not be possible in traditional lecture courses;
- Allow for self-assessment and self-learning;
- Improve communication between students, material and faculty.

This hybridization experience has shown an improvement in student outcomes. There is considerable evidence that BL formats contribute to measurable increases in student performance. In comparison with other international universities, a study conducted at a Canadian university, collecting feedback from students and instructors via surveys and interviews on four science courses converted to blended analysis has shown that emotional involvement is a strong measure of student satisfaction and success in BL modes [29]. Findings from another study in Brazil have significantly highlighted that students' levels of engagement are higher in blended learning [30]. The application of blended learning has brought an increase in the attention of students at Bina Bangsa IT College [31].

This experience is not the first for UCA. Since 2016, a professional degree course has been delivered in blended [32]. Another study in the use of m-mobile which is a part of blended was conducted, the results of which proved that the integration and use of m-learning facilitated the learners' access to the educational resources and materials offered by the university, which improves the learners' outcomes by enhancing learning [33].

As students become more connected and familiar with technology, they are more satisfied and more inclined to integrate distance education as a main complement to face-to-face education. In a survey conducted by the UM5, among 8355 students and 571 teachers in 2020, aimed at measuring their level of satisfaction and adaptation to the distance education system adopted to ensure pedagogical continuity, 71% of students and 84% of teachers were at least satisfied with the system. This, as long as they are supported and well prepared to overcome the technological obstacles that may hinder their learning. In this sense, the results published by the presidency of the UM5 have stated that more than 70% of students have never used distance learning before, and 72% of teachers surveyed confirmed that they have never used to teach at a distance before the confinement. This leads to a problem of adaptation to these new teaching/learning formats. This also brings us to another so-called common problem between universities, that of the use of technological tools and access to Internet. One of the challenges in blended learning is that blended course delivery increases the time demands and stress on institutions and teachers, hence the need to further motivate teachers by reducing their frustration with technological tools by preparing and training them in the use of ICTs. On the other hand, some professors seem reluctant to adopt the blended learning format since the involvement of technology in education requires changes in pedagogical approaches, which is very difficult. This is consistent with the outcome of the study conducted by the university of Nigeria [34], aiming to provide a critical look at strategies for improving blended learning in the post-COVID-19. The study has shown that teachers expressed the need for assistance from ICT support staff in each faculty to take full advantage of virtual learning.

According to the results of research carried out in Morocco in relation to distance and hybrid education, to improve higher education and better integrate technology for educational purposes, it is effective to adopt the model of Intelligent and Flexible Learning Model, which is the fifth generation of distance education, is the most suitable in our context. A model that aims to continue to exploit new technologies and take advantage of the characteristics of the Internet and the Web. This model is derived from the fourth



generation: Flexible Learning Model which is an Internet-based online delivery. It aims to ensure:

- Interactive Multimedia Content (IMM) online;
- Internet access to WWW resources;
- Computer mediated communication using automated response systems;
- Portal access to campus and institutional resources [35].

Many Moroccan universities have already implemented the fourth-generation distance learning initiatives; the fifth generation is emerging. By leveraging automated response systems, the fifth-generation Intelligent and Flexible Learning Model could achieve significant economies of scale in the management of instruction and academic support.

## 4 Conclusion

After this health crisis, it has been crucial to rethink the way we deliver education to our students, taking into account the key factors so that stakeholders (universities, educators and students) could better handle online learning platforms in the right way. Moroccan universities have adopted blended learning to deliver education in health conditions due to COVID-19. This paper focused on the experience of three major Moroccan universities with large numbers of students to provide post-COVID-19 education. Numerous tools have been made available to students by creating virtual classes via digital platforms, online assignments, dissemination of courses on communication tools, etc. In most cases, the blended learning experience has been appreciated by students and teachers in Moroccan higher education. However, there are challenges and difficulties encountered by both teachers and students that prevent this experience from being fully successful. Teachers can teach in blended mode, create digital teaching devices and materials and organize online and face-to-face sessions, but they must be trained in ICT and take advantage of the technical support to alleviate some of the work involved in hybridization, namely scheduling online and face-to-face sessions and transforming face-to-face lectures into online-delivered content. This study will also help to compare the different experiences in the country in order to develop this teaching/learning format that receives increasing interest as an option for the education of the future. Achieving this goal requires many improvement strategies to be put in place. Some of them:

- Develop a strategy for integrating blended learning for teaching and learning in Moroccan university institutions;
- Ensure that all educators are well trained in the use of technology for educational purposes;
- Provide engaging activities for students. Student engagement is a key factor in the success of the program;
- Improve the quality of Internet access services and provide the best technical support for teachers and students to improve teachers' ability to use LMS platforms and communication tools, among others.

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