

Medical distance learning in Covid-19 pandemic: the experience of the Agadir faculty of Medicine in Morocco

Moulay Omar Moustaine^{1,2*}, Othman Benhoummad¹, Mohamed El minaoui¹,
Kamal Rafiki¹, Laila Lahlou^{1,2}

¹Pedagogical innovation team. Faculty of medicine and pharmacy of Agadir. Ibn Zohr University. Morocco

²Ophthalmology department. CHU Souss Massa. Faculty of medicine and pharmacy of Agadir. Ibn Zohr University. Morocco

³Epidemiology and clinical research laboratory. Faculty of medicine and pharmacy of Rabat. Mohammed V University. Morocco

*Corresponding author: Moulay Omar Moustaine¹o.moustaine@uiz.ac.ma

Abstract:

Purpose: To analyze the experience of our medical school in distance medical learning (DML) during the Covid-19, his constraints and prospects.

Methods: A cross-sectional study has been conducted during the months of May and June of the year 2020 within the Faculty of Medicine and Pharmacy of Agadir, based on an anonymous questionnaire sent to students. The questionnaire is made up of four sections: Socio-demographic data; DML logistics; DML before and during the Covid-19 confinement; Perception and prospects.

Results: 35% of the medical school students participated in the study, the average age was 21.9 years +/- 4.28 with female predominance (68.4%). 90% of students follow DML courses on their own personal devices and 98.3% have internet access. 49.3% had already had following DML courses before the Covid-19. During the pandemic DML was based mainly on Google Classrooms (70.4%($p < 0.001$)) to replace face-to-face lessons and on ZOOM Videoconferences (25.5%($p = 0.022$)) to replace patient's cases discussions. 67.4% of students judged pandemic DML experiences as positive, 61.6% were satisfied in ($p = 0.01$).

Teacher-student communication was considered better than face-to-face according to 52.1% of students and 37.6% considered that student's interactivity was improved. 54.8% of students anticipate that the DML will be much more developed after the Covid-19 experience and will take a much more important place in the medical training exceeds 50% according to 24.8% of students.

Conclusion: The results of our study are reassuring and push us to work harder in order to improve the quality of DML and diversify its means to achieve more efficiency, interactivity and attractiveness.

Keywords: Distance learning; COVID-19; sanitary confinement; learning methods; medical training.

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I. Introduction:

Background/rationale

During the time of the confinement due to the COVID-19 pandemic, DML found all its usefulness to replace face-to-face courses and face the repercussion of the pandemic on the educational system.

Objectives

The study aimed to analyze DML experience during the pandemic of COVID-19 in the faculty of medicine and pharmacy of Agadir, the efficiency and the student's students' satisfaction.

II. Methods:

Ethics statement :

This study was approved by the faculty of medicine and pharmacy of Agadir (28-March-2020). The participation in the study was voluntary and informed consent was obtained from all participants.

Study design :

An observational, cross-sectional, quantitative, single-center study was conducted using a self-administered questionnaire.

Setting :

This study was conducted among students at the faculty of medicine and pharmacy of Agadir, Morocco. Data were collected from May 03, 2020 to June 30, 2020.

Participants :

This research included all students attending distance learning courses at the faculty of medicine and pharmacy of Agadir for the academic year 2021/2022. There was no exclusion criterion.

Variables :

Questionnaire was classified into four sections. The first describes the socio-demographic characteristics of participants, the second provides information on the logistics of DML, the third is dedicated to the experience of DML in COVID-19 and the fourth assesses the overall perception of DML.

Data sources/ measurement :

The measurement instrument used is a self-administered questionnaire created on the Askabox platform (<https://www.askabox.com>), the participation link was sent to students via e-mail.

Bias

The study included all students of the faculty who agreed to participate. Any selection bias was identified.

Study size

The calculation of the sample size for this study was based on the G*Power ver. 3.1.9.4 (<https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower>) [1]. The event rate under H0 is $p_1 = 0.5$, and that the event rate under H1 is $p_2 = 0.6$. The sample size necessary for a 2-tailed test (Z test for logistic regression) with an α error probability of 0.05, and a power of 0.8 was 208 students.

We included all the responses collected in order to improve the generalizability of the results. The actual sample size was 294 students.

Statistical methods

The qualitative variables were represented as frequency, percentages, and mean \pm standard deviation or median (interquartile range, IQR) for quantitative variables, and then compared by the Chi2 test or Fisher exact test according to the conditions of application of each test. P-values less than 0.05 were considered to indicate statistical significance. Statistical analysis was conducted using Jamovi (version 2.3.13. <https://www.jamovi.org>)

III. Results:

Participants :

294 students of the faculty of medicine of Agadir are participated in our study, i.e., 35% of all the faculty students, 201 (68.4%) were female, with a mean age of 21.9 \pm 4.28 years. 287 (97.9%) were Moroccan. They were from all levels of medical studies participated in the study especially the first and second cycle of medical studies (Table 1).

Table 1: Socio-demographic characteristics of participants

Socio-demographic characteristics	Mean	standard deviation
Age (years)	21,9	4,28
	<u>n</u>	<u>%</u>
Sex	Male	201
	Female	93
Nationality	Moroccan	283
	Foreigner	11
Level of education	1 st year	55
	2 nd year	59
	3 rd year	63
	4 th year	43
	5 th year	17
Intern	Intern	24
	Resident	33
Total	294	100,0

Main results :

265 (90%) of students followed their DML courses using a computer, 149 (50.7%) using a Smartphone and 32 (10.9%) using an electronic tablet.

These devices were their own in 90% of cases (258) and were shared with other family members in 10% of cases (29).

98.3% (289) have internet access at home, either via ADSL (63.9% (188)), or via 4G network (40.5% of cases (119)), or via optical fiber (13.6% (40)).

49.3% of students (145) had already experienced DML before covid-19, either in the form of a course that's taught completely in distance (36,3% of cases (53)), or by using accessible resources on the student space of the faculty's website (52.5% (76)). Digital platforms used for distance learning are illustrated in Table2.

Table 2: platforms and digital tools used to follow distance learning

Platforms and digital tools used to follow distance learning	Before lockdown (n=294)	After lockdown (n=294)	P value
EDX	2,7% (8)	2,7% (8)	-
Moodle	1,4% (4)	0,3% (1)	0,375
ZOOM	4,8% (14)	7,8% (23)	0 ,022
Google-Classroom	18,7% (55)	70,4% (207)	<0,001
Social media	0,7% (2)	2% (6)	0,125

During the Covid 19 period, all our students took their courses remotely. The platforms adopted (Table 2) as well as the nature of DML (Figure 1) were diverse.

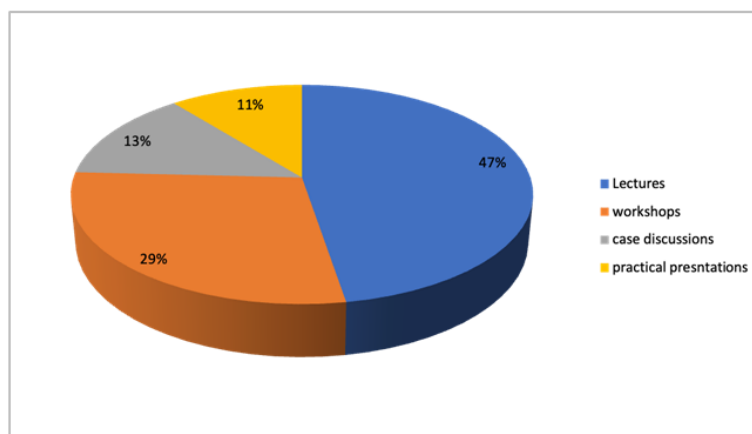


Fig. 1 : The nature of distance learning followed by students during lockdown

The experience of changing the teaching mode from face-to-face to distant learning had a positive response from 67.4% (174) of students. Thus 71.7% (185) of students report that DML makes learning easier and 62% (156) find the courses much more accessible. Teacher-student communication was considered better than face-to-face according to 52.1% (124) of participants and 37.6% (89) considered that student's interactivity was improved.

The obstacles that hinder the development of distance learning in our context are numerous:

- non-availability of a good and stable internet connection report by 73.1% (215) of students
- limited involvement of users reports by 49% (144) of students
- lack of suitable computer equipment reports by 39.8% (117) of students

74.8% of students are for the official use of social media in DML (YouTube channels, WhatsApp and Facebook lives). They find them easy to use, more accessible and more interactive.

According to our survey, 61.6% (181) of students are satisfied or or very satisfied with remote courses provided by the faculty of medicine and pharmacy of Agadir during Covid 19 period (Table 3).

Table 3: degree of satisfaction about DML according to the levels of studies.

Level of medical studies	Number (% included in DML satisfaction)			
	Not satisfied at all	Not bad	satisfied	Very satisfied
1 st year	7(24,1%)	20 (23,8%)	24 (19%)	4 (7,3%)
2 nd year	4 (13,8%)	19 (22,6%)	22 (17,5%)	14 (25,5%)
3 rd year	2 (6,9%)	11 (22,6%)	33 (26,2%)	17 (30,9%)

4 th year	2 (6,9%)	16 (19%)	20 (15,9%)	5 (9,1%)
5 th year	3(10,3%)	7 (8,3%)	6 (4,8%)	1 (1,8%)
Interns	4(13,8%)	4(4,8%)	9 (7,1%)	7 (12, 7%)
Residents	7(24,1%)	7(8,3%)	12 (9,5%)	7 (12,7%)
Total %	29(9,86%)	84(28,57%)	126(42,84%)	55(18,7%)

54.8% (161) foresee that DML will occupy an important place after Covid19, exceeding according to 24.8% (73) the 50% of medical training whereas 22.8% (67) judge that it is just a fashion effect linked to the Covid19 crisis and a comeback to traditional face-to-face teaching is essential.

IV. Discussion:

Key results :

The present study aimed to analyze the experience of our medical school in DML during the Covid-19.

More than half of the participants 67.4% of students judged DML experience positive and 61.6% were satisfied in (p=0.01).

During the pandemic DML was based mainly on Google Classrooms (70.4%(p<0.001)) and ZOOM Videoconferences (25.5%(p=0.022)).

Teacher-student communication was considered better than face-to-face according to 52.1% (124) of participants and 37.6% (89) considered that student's interactivity was improved.

54.8% of students anticipate that the DML will take a much more important place in the medical training exceeds 50% according to 24.8% of students.

Interpretation :

The positive perception of the experience of DML can be explained by many reasons:

During the pandemic period, DML was a salvage solution that allowed the continuity of educational activities while respecting the containment rules and distancing in the aim to protect community health. Also the accessibility, flexibility, verbal and visual simultaneity offered by DML can also potentially influence perceptions of satisfaction among students. This explains the positive impact of the DML received during the pandemic period

The previous familiarity with Google Classrooms and also the simple and playful character of the Zoom platform explains the dominance of these two pedagogical tools to ensure an emergency imposition of DML with the Covid-19 pandemic.

Our study reports paradoxically that teacher-student communication and student interactivity have been judged better than face-to-face. This observation can be explained by the creation of chat groups and class discussion forums this observation can be explained by DML, so even shy students dare to ask questions, interact and collaborate with their colleagues.

Comparison with previous studies :

Over the past two decades, e-learning has been increasingly used in health science teaching practices. In Morocco, many initiatives have taken place, aimed at modernizing higher education by integrating ICT (Information and Communication Technologies) within the framework of the national strategy "Digital Morocco" [2]. Thus, all the websites of Moroccan faculties have a "student space" where students are given institutional accounts allowing them to access a crossroad of information exchange and document sharing. It is through this space that 49.3% of our students had the experience of distant learning before Covid-19.

As many as these initiatives are in the framework of distant learning, there is still a lack of a clear strategy aimed to making distance learning a real component of the Moroccan university's education system, and it remains a mean of complementary support to the face-to-face learning in order to diversify the tools, enrich the education offered to students, improve the quality of the training, and facilitate access to courses for those having difficulty being present on the university campus [3, 4].

During the lockdown that followed the declaration of the health state emergency by the Moroccan government in March 24th 2020 to avoid the spread of Covid-19 [4], face-to-face courses have been canceled and schools and universities were closed until further notice. Moroccan universities have experienced a real crisis, leading to urgent reflection on what to do and how to do it [3,5]. Therefore, the switch to fully distance learning was the life-saving solution to ensure the continuity of education.

90% of students did not have any real logistical constraints (computer equipment, internet connection) to effectively follow their online courses, this observation should not be generalized about students of Moroccan universities given the inequality of economic and social opportunities of students [6, 7]. These logistical

constraints felt by 10% of students, disturbs the following of DML – which was not a choice during the lockdown – and undermines the principle of equal training opportunities.

In order to overcome the educational crisis and succeed in distance education, our teachers relied mainly on their own potential and knowledge in the field. Thus, an intensive update to the content of the student space of the faculty's website was carried out, in addition to that, teachers provided their theoretical course through Google-Classrooms in 70.4% of cases ($p < 0.001$) and Zoom-videoconferences in 25.5% ($p = 0.022$) to replace patient's cases discussions.

There has been a scarcity of use of learning content management systems (Learning Management System (LMS)), of which Moodle is the most popular [8]. This can be explained by the fact that LMS are paid for, and also by the lack of prior experience in using them.

Despite the difficulties and constraints encountered in our context, 61.6% ($p = 0.01$) are satisfied of the DML offered during the pandemic. This rate of satisfaction exceeds that found through the national survey on distance university learning with Moroccan students (42.7%) [6], and that found with Moroccan nursing and health technician students (53,3%) [9].

Contrary to what was reported as the pedagogical environment in videoconferencing meets, it is less affective and less interactive than face-to-face courses [9]. Our survey and those of other studies report an improvement in the teacher-student communication and student interactivity [11, 12].

74.8% of our students are for the use of social media in medical learning. The national survey about distance learning that was carried out during lockdown goes in the same direction and reports that these networks is used by 88% of students for distance learning [6]. However, since the involvement of a large ethics and social responsibility in DML the use of social media in practical training of health professionals remains a real controversy.

The obstacles that hinder the real development of distance learning in our context are numerous and are almost unanimously accepted by national surveys on the matter [6, 7]:

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- **The quality and stability of the internet connection:** this is the main obstacle according to 73.1% of our students, also reported by 57.38% of students during the national survey on distance learning during lockdown [6]. Connection instability negatively impacts the progress of videoconferencing sessions, which reduces students' motivation and involvement.
- **Students' attendance:** 49% of students believe that attendance is one of the main obstacles to good distance learning. The poor involvement of the participants and the non-respect of time and deadlines negatively influences the progress and the performance of DML, which relies above all on personal motivation and autonomy [13].
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- **Resistance to change:** Lockdown has profoundly changed the habits of all the teaching teams. Students and teachers were the first to see their daily lives turned upside down by the unexpected and sudden introduction to a totally distant way of learning, as a result some are unable to adapt, and others are trying.

Limitations :

Our study had some limitations that may influence our results, which should be interpreted with caution. Firstly, DML was sudden introduced without prior preparation by instructors or students without material or psychic preliminary preparation and secondly the study didn't consider the nature and the designs of the courses, synchronous or asynchronous.

Generalizability :

Although this was a single-center study (single medical school among the seven Moroccan schools) the results may be able to be generalized to all Moroccan medicine students if they participate in distance learning.

Suggestions :

DML is an educational method that is increasingly present in medical studies. The experience with Covid 19 reinforces this. Thus, it is strongly recommended that large-scale studies be conducted to regularly evaluate DML on different levels (institutions, teaching, and students. In addition, reflections on how to develop the technical skills of distance students and teachers are highly recommended.

V. Conclusion:

Crises are sometimes a good time to establish new habits and cultures. Actually, following this big experience during the pandemic, Moroccan educational system has been able to catch up several years in distance learning [6, 7, 14]. Our study has given an objective view to this experience in the medical field, its impact and its constraints. Thus, the majority were satisfied with the distance learning dilivated during the

COVID-19 pandemic despite the conditions and constraints of its introduction. Which are encouraging and push us to work harder to improve the quality of DML and diversify its means for more efficiency, interactivity and attractiveness.

Conflicts of interests:

The authors declare that they have no potential conflict of interest relevant to this article was reported.

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Legends for figures:

- Fig. 1 : The nature of distance learning followed by students during lockdown
- Table 1: Socio-demographic characteristics of the participants
- Table 2: platforms and digital tools used to follow distance learning
- Table 3: comparison of the degree of satisfaction about distance learning between different levels of studies.