Original Article

E-learning Experiences and Challenges among Faculty Members in Alfajr College's Undergraduate Medical Program, Sudan

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Abstract

Background: E-learning is a learning experience using various electronic devices and software programs. This study documents the E-learning experience and provides insight into acceptance and barriers.

Methods: This is a cross-sectional descriptive study at Alfajr College, Medicine Program, Sudan. The study adopted a questionnaire to interview the teaching staff, aided by a simple interview guide to collect data on the E-learning methods and approach. The college used both synchronized and asynchronized E-learning, using a Learning Management System (LMS). This was supported by user-friendly applications like WhatsApp and Telegram to be used by students. The college developed its own electronic application for assessments and electronic team-based learning that is LMS-augmented.

Results: A total of 84 faculty members were interviewed. E-learning was thought to be a flexible educational modality by 73% of the participants, and reasonably convenient to educators to use at their own speed (51% agreed, 20% disagreed, and 29% were uncertain). Barriers to efficiently using E-learning technology were: insufficient/unstable Internet connectivity (94%), decreased students' interactivity in the online course (87%), technical problems (86%), difficulties in receiving student feedback in the online course (66%), frequent interruptions by family environment at home (58%) and insufficient technology know-how by the faculty staff (41%).

Conclusion: Overall, faculty members accepted the technology well. Challenges reported included improving technology systems, more training for faculty staff, and improving student interactions and feedback.

Keywords: E-learning, medical education, teaching medicine, learning management system.

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Introduction:

Nowadays, technology has become an inseparable part in different aspects of our life, particularly in education throughout its different levels (1). E-learning is defined as learning through utilizing various electronic tools (e.g., laptops, desktops, smartphones, and others), whether live online when the internet is available, called synchronous, or offline, called asynchronous. Online E-learning could be a platform that makes the process of education more student-centered, creative, and flexible(2). The former terms (synchronous and asynchronous) are now very commonly used in the literature and play a key role in the analysis of students' interaction with teachers. Synchronous learning is when all interactors, tutors, and students exist at the same time, whether physically in a classroom or virtually through web conferencing, videoconferencing, or other web-based tools. On the other hand, asynchronous options do not require interactors to be available at the same time and offer a self-based experience using one's schedule (3). A few years ago, COVID-19 was one of the major triggers for large-scale adoption of E-learning, reflecting the flexibility of the education sector despite the challenges that accompanied the implementation (4,5). The most prominent challenges include weak infrastructure, financial barriers, limited funding, untrained teachers, and resistance to change (6). Despite that, the E-learning culture was accepted in the developing countries and represented a good facilitator for them to meet the growing need for education and fill the gap in the education workforce (7).

In the last few years, many African countries have adopted E-learning. However, the challenges faced negatively impacted better utilization (8, 9). The challenges reported were; a lack of E-learning policies, inadequate technological infrastructure, limited technical and educational competencies, and training for e-tutors and e-learners (10). This study aimed to document the E-learning experience at Alfajer College, study acceptance by the faculty members, and identify the challenges faced.

Materials and Methods:

Study design and area:

This is a descriptive cross-sectional institution-based study. The study was conducted in the Medicine Program at Alfajr College for Science and Technology, Khartoum, Sudan, in 2023, and targeted the teaching staff. The college has a long experience with E-learning since 2018 and even earlier, using simple tools, with the actual expansion and scale-up in 2020 following the COVID-19 pandemic.

E-learning methods and approach:

The educational activities are organized in organ-system-based courses that are structured in blocks. For the purpose of this study, the theoretical teaching and learning activities were divided between E-learning and in-campus learning according to the type and nature of the activities. The E-learning approach was blended learning, using a Learning Management System (LMS) through Moodle, using both synchronized and asynchronized E-learning. Later, recorded sessions (e.g., recorded PowerPoint presentations) were available at the LMS and easily accessible by the students at any time through their system accounts. For synchronized learning, the open-source virtual classroom software, BigBlueButton, was used. This was augmented by using student-friendly applications (WhatsApp and Telegram) for more interaction through group discussion and students' questions. For small group learning, the college assigned a programmer and developed its own program for electronic team-based learning (TBL). This was augmented by Moodle by adding the multiple-choice questions function to calculate the grades. The college also adopted the electronic-system-based assessments using Moodle-based assessments conducted through tablet devices.

Sample size and sampling technique:

A total population coverage for the teaching staff in all departments of the Medicine Program was targeted. Eighty-four faculty members were identified and included in the study. Three key informants on E-learning were purposively selected and asked to give their opinion on the relevant data on E-learning methods and approaches to be included in the study questionnaire. They were selected based on their experience and involvement in the E-learning processes and the education development efforts. They included: the Medicine Program Director, the Head of the Community Medicine Department, and a faculty from the Education Development Center.

Data collection and tools:

A structured, self-administered questionnaire was used to collect data from the teaching staff. The study adopted a questionnaire used by Tarus JK et al, which also tried to assess the challenges of implementing E-learning (8). The questionnaire was converted into an online Google form and then distributed to faculty members through WhatsApp. A simplified interview guide was used to collect data, from the selected key informants, on the methods and approach of E-learning used in the Medicine Program. The quantitative data collected, was analyzed using SPSS software, version 25. This includes; sociodemographic characteristics, challenges and acceptance of E-learning. A five-point Likert scale, from 1 (Strongly Disagree) to 5 (Strongly Agree), was used to assess faculty acceptance of E-learning at Alfajr College, measuring perceptions on flexibility, course challenges, student engagement, and exam administration. Mean scores were calculated for each item to quantify overall acceptance levels. The interpretation of the results of the Likert scale for the acceptance was based on a five-point scale from 1 (very bad) to 5 (very good). Descriptive frequency tables and graphs were used to present the data. The data on methods and approaches identified from the interviews was compiled and listed.

Ethical Considerations:

Ethical approval was obtained from the ethical committee at Alfajr College. A written informed consent to participate in the study was electronically signed by all the participants.

Results:

E-learning acceptance and challenges:

Of a total of 84 teaching staff who participated in this study, 51.2% were females. The participants' mean age was 37.5 years (SD±10.9), and the mean years of their experience was 7.15 years (SD±8.3). Among the faculty members, those who were MD/PhD (34.5%) and master's degree (29.8%) were from different academic departments.

Figure 1 shows the distribution of faculty staff by the different departments in the medical program of Alfajr College. Note that participants from basic science departments represented 45.2% of the total.

Table 1 shows that 73% of the participants agreed on the good flexibility of online teaching. However, just over half of the participants (51%) felt that online teaching allows the teachers to educate at their own speed.

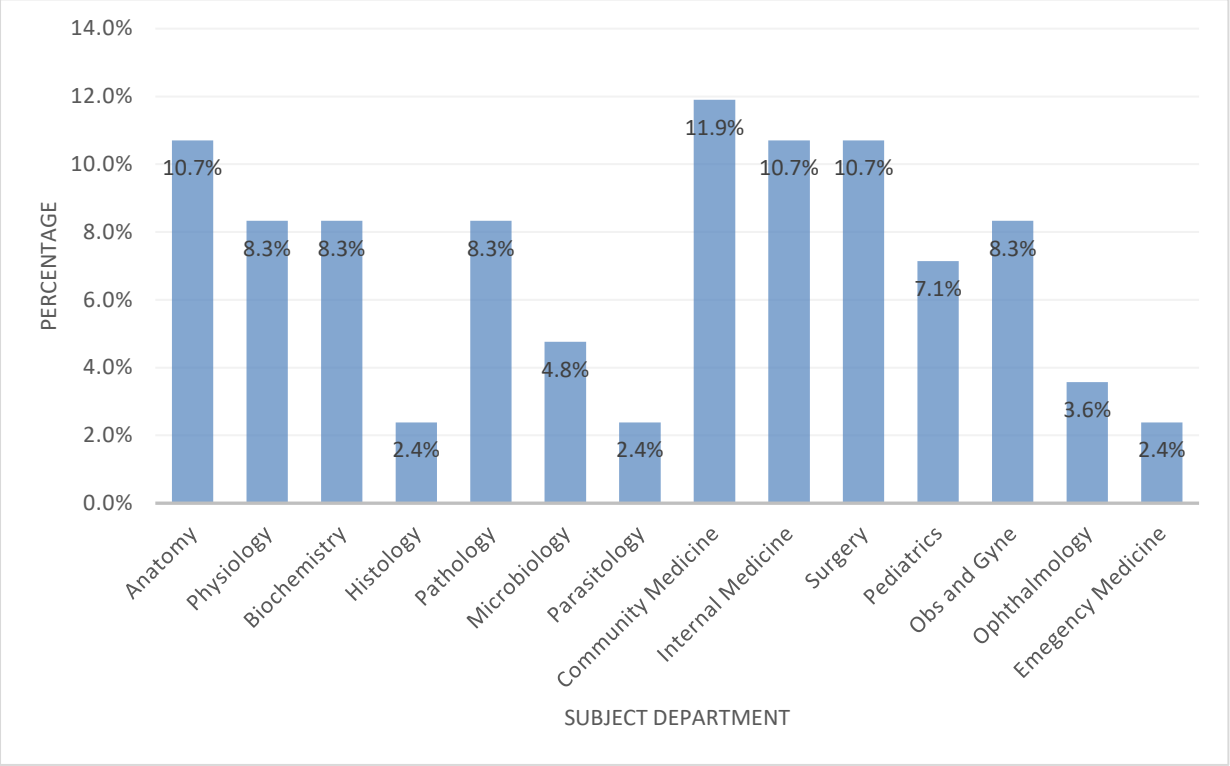

Figure 1: The distribution of faculty staff by the department (n= 84).

Table 1: Faculty E-learning experiences at Alfajr College, (n = 84)

Variables	Agree + Strongly agree	Not sure	Disagree + Strongly disagree
Online courses allow flexibility in teaching	61(73%)	13(15%)	10(12%)
Online practical courses are difficult for teaching staff	47(56%)	23(27%)	14(17%)
Online course design allows staff to educate at their own speed	43(51%)	24(29%)	17(20%)
Theoretical courses should be offered online	47(56%)	17(20%)	20(24%)
Face-to-face education is favored over online classes	73(87%)	6(7%)	5(6%)
A lack of student-to-student contact reduces the learning experience	52(62%)	12(14%)	20(24%)
Exams online are harder for students	40(48%)	17(20%)	27(32%)
Setting online exams is more time-consuming	35(42%)	15(18%)	34(40%)

Table 2 shows the important identified barriers of E-learning. The most prominent factors were: insufficient/unstable internet connectivity (reported by 94% of faculty), less

students' interactions when compared to traditional face-to-face classes (86.9%), technical problems (85.7%), and difficulties in receiving student feedback in the online course (65.5%).

Table 2: E-learning Challenges reported by Al-Fajr College faculty members (n = 84).

Variable	Frequency	Percent%
Insufficient/ unstable Internet connectivity	79	94%
Technical problems	72	86%
Heavy workload of the online courses	13	15%
Limited technology skills of the staff.	34	40%
The level of interactions with students in the online course is lower than in a traditional face-to-face class	73	87%
Difficult to receive student feedback in the online course compared to face-to-face class education.	55	65%
Lack of a suitable online environment at home (e.g., interruptions by the children and other family members)	49	58%
Difficult applying distance E-learning for practical sessions and courses.	24	29%
Longer time to prepare for an online course.	17	20%
Lack of incentives/ Non-repayment for Internet outside the college.	15	18%

Discussion:

Facilitated by the COVID-19 pandemic, E-learning implementation was expanded at Alfajr College of Medicine using different methods, mainly, the installation of the Moodle Learning Management System (LMS) and using both synchronized and asynchronized approaches to provide students with an equal, innovative, and accessible educational environment (11). Globally, other educational institutes reported hard times due to the pandemic (12), which prompted them to utilize E-learning (13). In this study, the faculty members had an average of 7.5 years of teaching experience, which is a facilitatory factor as they tailored their experience with E-learning for better utilization. Additionally, the faculty's ages were within the young to young-adult category; this is an advantage as young generations are familiar with the newly advanced technological tools and software. Other studies highlighted the younger age of teachers as a facilitating factor in introducing E-learning in medical education (14). Consistent with other African studies, the staff members did not receive any training program regarding using the online environment (15). However, the staff came with diverse ages and qualifications. Medical Doctorates'/Philosophy Doctorates', Master's, and Bachelor's holders offer a good opportunity for experience

exchange and support using E-learning methods. Other studies from Africa also highlighted the important role of faculty already experienced in E-learning (16).

In line with previous studies that highlighted the flexibility and self-pacing of E-learning, the staff acknowledged the flexibility of E-learning in terms of: no specific place or time is required for the E-learning process. In addition, the self-pacing characteristic of E-learning was attributed to the ability of the student to perform at their comfortable rate and preferred time (9).

Despite the limitation of E-learning in delivering practical courses reported in other studies (17), the overall acceptance was good, which provides good expectations in expanding the use in the future (18).

Although E-learning eases the assessment process and shortens the time for exam results, the utilization of online assessment is still a controversial point. This drawback was highlighted in previous studies that demonstrated a preferable utilization in delivering information rather than assessment (19).

In agreement with many other developing countries' studies (20), the study found that internet connection instability, interruption of electricity, and technological problems were the main factors limiting the use of E-learning. Other factors were difficulties in receiving students' feedback in the online courses compared to traditional face-to-face classes and a lack of a suitable online attendance environment at home (e.g., the presence of children and other family members). The staff members highlighted that one of the significant barriers is the limited technology skills of the faculty, which discloses the need for a faculty training program in the future; this, as well, was strongly recommended by Walimbwa et al (21). Participants stated that materials preparation takes a longer time, with sessions and technical issues making it even longer. Other studies conducted by Nyerere et al also identified that delay in the production of study material and time consumption as the main barriers toward E-learning (22). Lack of incentives/ non-repayment for internet outside the college, on top of the economic inflation occurring in the country also considered a challenge for teachers, as many of them may be less enthusiastic about E-learning. While funding generally remains a significant challenge in Sudanese universities (23), teachers were always concerned about inadequate funding when it comes to E-learning, which affects E-learning negatively (24). That agrees with an integrated review that emphasized good lecturers' E-learning skills and higher incentives were the main enablers of E-learning, while inadequate financial support was considered a significant barrier to E-learning implementation (25).

Limitations:

The study design (cross-sectional study) is one of the limitations to in-depth assessment. Also, the data was limited for a comprehensive insight into the experience. The study also did not include the students' opinions and perceptions, in addition to focusing only on the medicine program.

Conclusion:

Overall, there is an agreement on the usefulness of E-learning and good acceptance. Internet connectivity issues represent a common challenge, followed by decreased levels of interactions with students. This could be solved by opting for the strongest internet networks in the country and adding functions to improve the interaction level. Another challenge is the poor technology skills of the faculty, which can be enhanced by the provision of regular training. Furthermore, considering staff incentives to cover the internet cost would be a facilitatory strategy.

Conflict of Interests:

Authors declare they have no conflict of interest

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