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# A Qualitative Approach on Impacts of Online Learning Towards University of Cyberjaya Clinical Years Medical Students

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## ABSTRACT

The recent COVID-19 pandemic has taken a toll and impacted most sectors, including the academic field. With this sudden shift away from the classroom in many parts of the globe, some are wondering whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the worldwide education market. Most countries have shifted to online learning in adaptation to the new normal. In this study, we aimed to study perceptions towards the impact of online learning on University of Cyberjaya (UoC) clinical year medical students through a comprehensive interview. A total of 23 participants had joined this study including 13 students with a focus group of another five students, four clinical years lecturers, and an IT staff in UoC. As various people may have different perceptions, a focus group was organised so that students could discuss their experiences in greater depth. The information was gathered through in-depth semi-structured questionnaire interviews done via Microsoft Teams. The results were arranged based on topics that were covered, including interactions between lecturers and students during online courses, students' experiences impacting the effectiveness of online learning, impediments to online learning, and effective approaches to improve online learning. There were 32 codes and 16 themes altogether. Through this study, we conclude that online learning is still beneficial but has limitations due to various factors. Therefore, more efforts still need to be made to improve the quality of online learning, especially for clinical years students.

**Keywords:** *COVID-19, Online learning, Clinical years, Education, Medical*

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## INTRODUCTION

The recent surge in online education in Malaysia, driven by the COVID-19 pandemic, particularly in primary and secondary schools, has incorporated Harasim's (1989) innovative approach (1). This approach combines online learning

with in-person instruction using computer-mediated communication, offering diverse learning experiences, involving communication through devices, enabling various student participation methods, transforming social interactions, and reducing discrimination and prejudice (1, 2).

A comprehensive systematic review compared online and offline learning for health professional learners, involving 76 publications comparing internet-based interventions with non-internet interventions and 130 articles with no interventions as controls (3). The findings indicated that internet-based interventions had positive benefits compared to no interventions, but these effects were often minor when compared to offline training. Another systematic review suggested that online training for licensed healthcare professionals could be equally successful as offline, although the overall results did not clearly distinguish between online and offline learning (4). Teacher-student interaction is vital in online learning, affecting student attitudes and tutor perceptions (5). Effective communication, involving information exchange and listening, is a top priority for achieving educational goals, promoting change, clarity, and idea conveyance (6).

Online learning can be challenging as it requires students to adapt to new environments and learning styles (7, 8). Self-directed learning, where students set goals and take charge of their progress, benefits from the flexibility of online learning (9). Those with strong communication skills tend to perform better (10, 11). Learners' control over their experience depends on their ability to guide themselves, leading to improved performance (12–14).

Listening and observing play a significant role in learners' participation in online discussions, constituting active learning. Research indicates that mixing audio or video discussions with text discussions enhances communication and encourages participation (15–21). While online learning can be beneficial if students adapt well, their experience is crucial for comparing physical and online learning. This study focused on clinical year medical students aims to explore lecturer-student interactions, how student experiences affect online learning, barriers, and effective improvement methods.

## METHODOLOGY

This cross-sectional qualitative study involved 262 clinical-year medical students, 79 lecturers, and staff at the University of Cyberjaya (UoC). The research aimed to understand the effectiveness of online learning among clinical-year medical students who had been using it for over a year and were currently in clinical settings. A qualitative approach was chosen for its ability to provide in-depth insights into the causes and impacts of specific issues (3, 4). The study included 23 participants, comprising 18 medical students, one IT staff member, and four clinical lecturers, who shared their perspectives. The sample size met the saturation point recommended for qualitative studies, with a minimum of 12 participants (22–24). Convenience sampling was used to recruit participants who had experience with online learning, excluding those with absenteeism issues or who did not provide consent.

Key informants, including lecturers and IT staff, were personally approached and invited to participate in the study. After recruitment, candidates were randomly selected for pre-scheduled, in-depth semi-structured interviews. The researchers ensured comprehensive coverage of important questions by conducting a literature review. The questionnaires used for individual students and focus groups were identical.

For individual interviews, researchers conducted one-on-one sessions to gather necessary information. In contrast, for focus groups, five different students were interviewed as a group to discuss the same questionnaires, with the researchers collecting the group's discussion outcomes. This approach allowed for in-depth exploration, considering that individuals may have varying perceptions. Although studies often form multiple focus groups (25), our research included both individual and group interviews, revealing repetitive data in both cases. Hence, five participants

in the focus group were deemed sufficient to reach data saturation. All sessions were conducted online via Microsoft Teams due to COVID-19 restrictions, with participants' consent and recorded video, while researchers also took notes during the interviews.

Qualitative data analysis involves organising, synthesising, and identifying patterns in data to extract valuable insights (26). Thematic analysis was employed to identify and code data into common themes, which were then organised into the QDA Miner Lite version 2.0.9 (2004–2016) software (Provalis Research, Montreal, Canada). Results from individual (Table 1) and focus group (Table 2) interviews, which shared common themes, were combined and summarised into tables using the software.

In terms of ethics, the primary consideration was informed consent, with participants educated about the research objectives and methods. They were guaranteed anonymity and confidentiality of their personal information. Participation was entirely voluntary, and participants could withdraw at any time without remuneration. Additionally, the study received no external funding.

**Table 1:** Interviewees' background for the in-depth interviews (individuals)

| Interviewee | Position        |
|-------------|-----------------|
| A1          | Medical student |
| A2          | Medical student |
| A3          | Medical student |
| A4          | Medical student |
| A5          | Medical student |
| A6          | Medical student |
| A7          | Medical student |
| A8          | Medical student |
| A9          | Medical student |
| A10         | Medical student |
| A11         | Medical student |

(Continued on next column)

**Table 1:** (Continued)

| Interviewee | Position        |
|-------------|-----------------|
| A12         | Medical student |
| A13         | Medical student |
| A14         | Lecturer        |
| A15         | Lecturer        |
| A16         | Lecturer        |
| A17         | Lecturer        |
| A18         | IT staff        |

**Table 2:** Interviewees' background for the in-depth interviews (focus group)

| Interviewee | Position        |
|-------------|-----------------|
| B1          | Medical student |
| B2          | Medical student |
| B3          | Medical student |
| B4          | Medical student |
| B5          | Medical student |

## RESULTS

The results were divided into four main sections to provide clear explanation based on the research objectives. The first section focuses on lecturers-students' interactions during the online courses, while the next section describes the effectiveness of online learning based on students' perceptions and experiences. Barriers to online learning are discussed in the third section which would show the disadvantages faced by students or lecturers. Finally, the last section provides suggestions on ways to improve online learning effectively.

### Perceptions of the Impact of Online Learning on the Lecturer-Student Interaction

The rise of online learning has sparked discussions about its impact on lecturer-student interactions. Advocates highlight increased flexibility and personalised engagement, while critics express concerns about the potential loss of face-to-face

**Table 3:** Code frequency on impact of online learning on the lecturer-student interaction

| Category              | Code                                   | Count | % Codes | Cases | % Cases |
|-----------------------|--|-------|---------|-------|---------|
| Learners’ readiness   | Lack of confidence in online           | 1     | 6.3     | 1     | 100.0   |
|                       | More confidence during online learning | 3     | 18.8    | 1     | 100.0   |
| Communication barrier | Poor internet connection               | 4     | 25.0    | 1     | 100.0   |
|                       | Inefficient interaction                | 2     | 12.5    | 1     | 100.0   |
|                       | Lack of feedback from peers            | 1     | 6.3     | 1     | 100.0   |
| External barrier      | Students’ conditions at home           | 1     | 6.3     | 1     | 100.0   |
| Participation barrier | Limited interaction                    | 3     | 18.8    | 1     | 100.0   |
| Instructors’ interest | Helpful and responsible                | 1     | 6.3     | 1     | 100.0   |

connection. This evolving paradigm prompts a re-evaluation of educational dynamics in the digital age. Table 3 shows various categories of perceptions on lecturer-student interaction during online learning.

**Learner’s readiness**

Learners’ readiness is an important aspect of acquiring knowledge because that determines the interactions between lecturers and peers. In this study, students mentioned that they feel a lack of confidence in asking questions online while many of them mentioned they feel more confident online.

During online class, students must ask in front of other students, so most students tend to step back and keep the question to themselves. They, they will text the lecturer after class rather than asking during the class. (A1)

Online is better as students can simply switch on the mic and ask questions, whereas in physical class, students will need to be confident to ask the questions directly. (A3)

I feel more confident to interact with the lecturers as there is no one around my physical surrounding. (A5)

I feel more confident and not awkward to voice out my curiosity. (A6)

**Communication barrier**

Although the internet is a wonderful and necessary resource for online learners, it can also cause problems. Without a strong internet connection or high bandwidth, online learning becomes nearly impossible, and keeping up with the technical requirements of a chosen course can be stressful. This can lead to various communicative problems between the lecturers and students. The students mentioned that poor internet connection is the one of biggest communication barrier during their online class thus they suggested that face-to-face classes is way better than online.

Unless there are connection issues, then communication will be a problem and disrupts the flow. (A2, A9, A11, B1)

For students, it is better to discuss face to face among peers. (A3, B2)

There was some communication barrier between students and lecturers when it comes to replying to messages as there was no immediate reply. Thus, it may be difficult to make certain decisions. (A13)

**Participation barrier**

Conversion of formal teaching to online causes learners’ participation to get limited and lecturers mentioned students need more hands-on experiences in their clinical years.

Difficult to adapt as students in clinical years require hands-on experience. (A14, A15, A17)

We ask each student to switch on their cameras and perform the physical examination thoroughly, we ask questions to them and we have a feedback session at the end of the class. (A14, A15, A17)

As for students, it is quite challenging too because they undergo the same situation and stress during online classes especially when they were not be able to physically meet their peers. Some of the students stated that they felt awkward when having classes online, especially when doing presentations.

My interaction with other students is also decreased as I only interacted with my close friends or my team members. (A7)

It is still not the same as meeting each other face to face and not enjoyable and fun, feeling of awkwardness when presenting online because the reaction isn’t the same. (A10)

A deeper connection could be formed through physical interaction. (A12)

**Perceptions on How Students’ Experience Influences the Effectiveness of Online Learning**

The effectiveness of online learning hinges on the student experience. As digital platforms shape modern education, factors like interface design and accessibility become crucial. This brief introduction sets the stage for exploring how user experience influences the success of online learning initiatives. Table 4 demonstrates how students’ experience influences the effectiveness of online learning.

**Learner’s participation**

In this study, we can see that learners’ participation can influence the effectiveness of online education based on the students in UoC.

Cameras should be turned on during classes to include more participation. This helps students to maintain their focus better in class and to avoid one-way interaction. (A6)

Motivation is worth exploring in an online course because students are inclined to participate less, and high attrition rates lead to motivational questions in distance education for instructional designers.

**Table 4:** Code frequency table on students’ experience influences the effectiveness of online learning

| Category                | Code                     | Count | % Codes | Cases | % Cases |
|-------------------------|--------------------------|-------|---------|-------|---------|
| Learners’ participation | Motivation               | 5     | 15.8    | 1     | 100.0   |
|                         | Network support          | 7     | 22.0    | 1     | 100.0   |
| Instructors’ content    | Instructional strategies | 2     | 6.4     | 1     | 100.0   |
|                         | Feedback                 | 2     | 6.4     | 1     | 100.0   |
| Instructors’ barriers   | Teaching styles          | 4     | 12.5    | 1     | 100.0   |
|                         | Communication barriers   | 5     | 15.8    | 1     | 100.0   |



Students should try their best to stay motivated when participating in classes. This can be done by engaging more with the lecturers by switching on their cameras or by having feedback sessions. (A1, A2, A3)

Good internet connection can improve the interaction among students and lecturers in terms of participation in class. (A4, A9)

### **Instructors' content**

Due to the change from physical classes to online classes, instructors may have to change and adapt their ways to make syllabus content suitable for online methods. Though it may seem easier compared to students' ways of adaptation, it is the instructors who have the responsibility to ensure students are able to catch up with the instructions and take home messages even via online.

Due to the lack of physical interaction, students would rely heavily on the instructors' content in online classes.

Lecturers should provide a proper briefing for each topic before each class. (A5)

To improvise their educational content, it is important for lecturers to receive feedbacks, but as the online facilitator, it is essential to learn what most hinders and/or enhances the learning process to be able to improve the teaching-learning collaboration.

I would ask for my students' feedback on my classes and improvise according to their needs. (A17)

### **Instructors' barriers**

As all educators are aware, tapping into various learning styles and resources is essential to help students successfully achieve the learning outcomes. One of the first learning curves was redesigning the syllabus.

I would frequently make sessions interactive by providing my students with questions and case scenarios for them to be able to understand clinical cases better. (A17)

I would ask questions to each of the students in class to make sure there is mutual understanding among the topics learned. (A18)

Learning content must be disseminated via e-learning that promotes critical thinking, reflection, active participation, and that thoughtfully engages learning. Regular communication via announcements and class emails provides more guidance and keeps students on track.

Lack of prompt response from lecturers makes it difficult to communicate among each other and make certain decisions. (A2, A7, A9)

### **Perceptions on Factors Determining the Quality of Online Instruction**

The quality of online instruction is shaped by multiple factors, including content design and communication effectiveness. This brief introduction paves the way for exploring the key determinants that influence the overall quality of digital education. Thus, it is crucial to explore factors determining the quality of online instruction based on medical students or lecturers (Table 5).

**Table 5:** Code frequency table on factors determining the quality of online instruction

| Category             | Code                        | Count | % Codes | Cases | % Cases |
|----------------------|-----------------------------|-------|---------|-------|---------|
| Internal barriers    | Attitude                    | 3     | 11.5    | 1     | 100.0   |
|                      | Lose focus                  | 3     | 11.5    | 1     | 100.0   |
|                      | Exhaustion                  | 1     | 3.8     | 1     | 100.0   |
|                      | Stuck in comfort zone       | 1     | 3.8     | 1     | 100.0   |
| Technical problem    | Poor internet connection    | 1     | 3.8     | 1     | 100.0   |
| Educational barriers | Lack of clinical experience | 12    | 46.2    | 1     | 100.0   |
|                      | Limited Q&A                 | 1     | 3.8     | 1     | 100.0   |
|                      | Limited communication       | 1     | 3.8     | 1     | 100.0   |
| Instructors          | Altered schedule            | 1     | 3.8     | 1     | 100.0   |
|                      | Limited accessibility       | 1     | 3.8     | 1     | 100.0   |
| External barriers    | Unconducive                 | 1     | 3.8     | 1     | 100.0   |

### Internal barrier

The internal barriers are the mental or psychological blocks that preoccupy the innermost thoughts and obstruct active listening. Internal barriers correspond to hindrances inside of us, including thinking, attitude, perceptions, as well as the way of communication.

In relation to this research, the participants realised that the internal barriers they are encountering are their attitude, focus, stamina, and comfort zone throughout the online learning. This is evident by:

I tend to take the classes for granted as all sessions can be recorded. (A1)

Online sessions can be recorded so students can refer to them anytime. We experience passive learning during online classes. Moreover, we only learn in our comfort zone because we do not experience real situations. (B1, B2, B3, B4, B5)

Focus given during online sessions is not the same as in physical classes. (A2)

Online learning does require high concentration level to stay focused in class. (A8)

Online class is more tiring as compared to physical classes as physical classes have a fixed schedule. (A12)

### Technical problem

Poor IT infrastructure is a major issue in online learning which is encountered among the participants. This variation in connectivity may impact the type of online learning or constrain student engagement with the class. However, only one interviewee addressed this issue which may show less significance of this factor in influencing the quality of online learning. This is evident by:

Online learning has limitations in terms of network connection as it affects the online learning platform. (A1)

### Educational barrier

In addition, since the participants are in their clinical years, online learning is considered inefficient because they are deprived of many aspects, especially clinical experiences, and skills. This is evident by:

Online sessions are not as efficient, as learning requires physical contact with real patients. (A3)

Online learning is not sufficient because students are left behind in practical skills. (A6)

Online learning is less beneficial for those in clinical years. (A7)

Lecturers or students act as simulated patients; thus, students only know how to explain in medical terms but real patients would probably not understand. Students also may not know how to tackle issues with real patients. (B1, B2, B3, B4, B5)

Students are having a hard time as they did not get to see and appreciate clinical signs present in patients suggestive of diseases. Insufficient clinical practices result in awkwardness for the students when performing clinical examinations for the patients. The gestures, placements of the students' hands and techniques are often wrong or might cause inconvenience to the patients due to lack of practice.

### Instructors

Instructor presence is an important construct to consider when designing or facilitating online instructional experiences. However, with online learning, there are also some weaknesses of the instructors. An interviewee said:

Online classes require more flexibility in terms of time for students as lecturers may not conduct classes according to the original timetable... (A12)

This reflects the downside from the instructors that cause inconvenience to the students to prepare mentally for another session at another time.

On top of that, the participants felt that there is limited accessibility between students and instructors, as stated by:

Lecturers may not know students' conditions in online settings. (B1, B2, B3, B4, B5)

This barrier was thought to evolve as the instructor was at a disadvantage because they have limited access to evaluate students and monitor ongoing situations via online.

### External barrier

External barrier corresponds to hindrances outside that includes people and environment. Participants believe that unfavourable environment did affect online learning, as stated below:

It is not conducive enough to be considered a good replacement for face-to-face sessions. (A9)

An unconducive environment is multifactorial. As most students attend learning sessions online from home during Movement Control Order (MCO), the problem arises there. This is well demonstrated by:

The most ideal way would be to be in a conducive environment such as stable internet connection, a proper study room and a quiet space to avoid distractions. (A12)

Having online learning at home, the students are weighted with family members' issues. Some of them encounter family members that lack in understanding of their commitments as students and were instructed to do house chores or asked for favours amid online learning.

Students will need to have their own study area and let other family members know that they're having classes. (A2)



**Table 6:** Code frequency table on ways to improve quality of online education

| Category                 | Code                              | Count | % Code | Cases | % Cases |
|--------------------------|-----------------------------------|-------|--------|-------|---------|
| Technical support        | Network improvement               | 2     | 6.3    | 1     | 100.0   |
|                          | Learning platform standardisation | 1     | 3.1    | 1     | 100.0   |
| Learners' adaptations    | Learners' readiness               | 6     | 18.8   | 1     | 100.0   |
|                          | Suitable learning environment     | 14    | 43.8   | 1     | 100.0   |
|                          | Learners' participation           | 3     | 9.4    | 1     | 100.0   |
| Instructors' adaptations | Teaching styles                   | 3     | 9.4    | 1     | 100.0   |
|                          | Instructors' interest             | 3     | 9.4    | 1     | 100.0   |

### Perceptions on Ways to Improve Quality of Online Education

Enhancing the quality of online education is a dynamic challenge with various strategies at play. From refining course content to fostering interactive engagement, this introduction lays the groundwork for an exploration of effective methods to elevate the overall quality of digital learning experiences. The result of this study is arranged in Table 6.

#### Technical support

In addition, high network availability plays a vital role in student's or lecturers' participation. As stated by the following code, the higher quality of the network will ensure a better flow of online education whereas students or lecturers with weaker network speed will jeopardise the quality of the experience as well. It has been clearly stated by:

Government can improve the network quality by providing better telecommunications network to help students adapt to online learning. (A1)

Education institutions can subscribe to a better learning platform and cooperate with the lecturers to standardise the learning

platform thus the students do not have to subscribe or download many different software. (A5)

#### Learners' adaptations

This factor may affect students' input during online classes, and they must find a solution to overcome such troubles. In this study, a suitable learning environment would be beneficial while attending online sessions as indicated by the code above. While electronic devices are required for online learning, they easily steal attention for prolonged periods, as mentioned below:

Having discussion with friends to enhance the understanding after the online sessions. (A8)

The most ideal way would be to be in a conducive environment such as stable internet connection, a proper study room and a quiet space to avoid distractions. (A12)

According to the code after that, learners' readiness is a dimension to be improvised to maintain a better quality of online learning.

We, students can prepare a schedule and wake up early to prepare ourselves for the class as if we are going to attend a face-to-face class. The preparation helps the mindset of focus during online classes. (A10)

Find ways to allow yourself to have a good mental state to be able to give full focus and attention to the online class even though sometimes it is hard to apply due to unavoidable circumstances. (A11)

In line with the code above, it is no doubt that learners' participation is a challenge in online learning.

The students should engage more in class when the lecturers ask questions. (A7)

It would be better to include videos on practical techniques during the presentation or task-based learning (TBLs), so that students can ask lecturers. Role play sessions can also be conducted with friends or lecturers during online class, it allows students and lecturers to identify their flaws, so they can improve better. (A9)

### Instructors' adaptations

The expectations from lecturers towards the students will be different in online settings and this leads to a change of roles among the lecturers. As specified by the code in the table, some of our respondents had suggested the instructors changed their teaching method. Another difficulty faced by lecturers is the need to switch to different teaching methods to adapt to this new experience.

Lecturers can attend courses to guide them on how to attract students' attention. In addition, maybe they can introduce platforms which pique the interest of students. (A1)

As for the instructors, they can improve online education by giving 5 minutes rest for every 45 minutes class and provide quizzes for the students at the end of classes. (A7)

According to the code above, the attitude of instructors will influence students' input

significantly as lecturers are to ensure all students can achieve their expectations from the online sessions. A few respondents and lecturers in this study had given their opinions on lecturers' interest in students' performances in online settings:

By enabling everyone to switch on their cameras, the session can be more interactive and students will be more focused in class as compared to not switching it on. (A13)

I would usually conduct morning class when the students are more energetic. In the afternoon, I will conduct online history taking sessions to try to increase their energy levels. (A16)

## DISCUSSION

### Perceptions on Factors Influencing the Effectiveness of Online Learning

#### Learner's participation

In this study, it explores how learners' active participation, including behaviours like discussions, impacts the effectiveness of online education. According to Abdullah et al. (27), an effective learning process occurs when students and educators (lecturers) can interact and participate in learning activities. Active student engagement in learning behaviours, such as listening, responding, and discussing, is essential for better academic achievement and reaching learning goals (28).

Our research shows that students emphasise the significance of network support in online learning, consistent with the study of Chung et al. (29), which highlights internet connectivity challenges. The majority use mobile data (60%) rather than Wi-Fi (45%), free mobile data (44%), or pocket Wi-Fi (13%). Siddiquah and Salim (30) and Bisht et al. (31) suggested that internet signal issues can hinder student learning. Similarly,

Wickramanayake and Muhammad Jika (32) underscore unreliable internet connections as a common barrier for students.

Barriers to online teaching and learning encompass increased workload, changes in the lecturer's role, lack of technical and administrative support, and potential reductions in course quality (33). Effective staff development is crucial for teachers to confidently and competently facilitate online interactions. This aligns with the present research, which highlights students' agreement on the impact of instructional strategies on online education quality.

#### **Instructor's contents**

This study has shown that the content provided by their instructors influences the effectiveness of online classes due to shifting from physical classes to online classes. This is consistent with an article by Chametzky (34) and Luyt (8) that stated the content of online courses should be learners centred as this would enhance interactions with peers and lead to more discussions. Learners and instructors should first learn how to effectively optimise technology before conducting online courses.

#### **Instructor's barriers**

Transitioning from physical to online classes alters student-lecturer communication. In traditional settings, immediate face-to-face discussions are common, but online communication primarily relies on email or messaging apps. This present study reveals that teaching style significantly influences online education effectiveness, consistent with findings in Anderson et al. (35) that note the absence of clear guidelines in online courses. Communication barriers are a major issue for lecturers, aligning with the observations in Crawley et al. (36) that face-to-face interactions and visual contact are often lacking in online teaching.

### **Impact of Online Learning on Lecturer-Student Interaction**

#### **Learner's readiness**

Success in various literacy styles requires qualities like self-determination and a commitment to excellence. Without these, learners may struggle to meet the demanding expectations. Our study found that respondents felt more confident during online learning compared to physical classes because they could ask questions without the need for physical presence in the classroom.

Khairuddin's research (37) emphasised six key readiness factors, including self-confidence, acceptance, and training, significantly influencing students' readiness for online distance learning (ODL). While many students appeared doubtful about technology accessibility and ODL willingness, they were generally prepared to adapt. Universities and educators must gain a deeper understanding of student readiness for ODL to facilitate its further implementation.

Therefore, a learner's readiness with a good attitude and preparedness of handling the online class helps contribute to teaching-learning sessions with confidence.

#### **Communication barriers**

The primary obstacle to student-lecturer engagement is poor internet connectivity, causing delays in decision-making and hindering effective interaction (38). Kemp and Grieve's study (39) support this, noting the significance of quick feedback in traditional in-class activities. Face-to-face instruction offers unique learning attributes that are currently lacking in online teaching, providing greater stimulation and direction for students.

### **External barrier**

A significant challenge in transitioning to widespread online learning is the varying capacity of parents to support their children's education. Cuisia-Villanueva and Núñez's study (40) among University of Philippines students highlighted external barriers like the lack of private study spaces and difficulties in addressing student concerns during e-learning. This underscores the need for additional support to improve home learning conditions and enhance student-lecturer interaction.

### **Participation barriers**

Students in this study expressed discomfort and limited interaction in online classes, particularly during presentations, due to the absence of physical meetings with their lecturers and peers. Understanding students' teaching preferences and their assessment system perception is crucial. Students actively participate in their education, favouring student-centred approaches like dialogues and discussions, but they feel that online learning diminishes their sense of community with peers and instructors, even in partially online classes.

### **Instructor's interest**

A survey of students in an Indian university by Muthuprasad et al. highlighted the importance of instructor competence, interest, and effective multimedia presentation in online teaching during the COVID-19 pandemic. Ineffective professors were seen as a major factor contributing to the failure of online courses (41). However, in this present study, students found their lecturers to be helpful, responsible, and genuinely interested in their online teaching. In summary, the quality of online instruction and instructor engagement significantly impacts student engagement, literacy, and course continuity. Both students and instructors play a crucial role in the success of online teaching.

## **Barriers of Online Learning Affecting Students' Understanding**

### **Educational barrier**

Boling et al. (42) revealed that most participants perceived online courses as isolating, leading to feelings of disconnection from teachers, course content, and peers. Similarly, participants in this study at UoC also experienced limited communication with lecturers and friends. Communication skills involve conveying a message in a way that ensures mutual understanding within the given communication context (43). Effective communication skills are vital for teacher-student interactions (44), but many participants in this study acknowledged that online learning restricts the Q&A sessions, raising concerns about its potential impact on academic performance.

An online learning environment can impact student motivation by limiting opportunities for discussion and questions, potentially leading to misinterpretations of topics, as noted in a study (45). Many online tasks restrict the development of higher-level cognitive abilities and imaginative thinking (46). Participants expressed a lack of clinical experience due to the inability to access hospitals for practice, which aligns with the findings in Alsoufi et al. (47), where a majority disagreed with the effectiveness of e-learning for clinical aspects due to its inability to cover practical lessons.

### **Instructors**

In our study, participants identified issues with instructors affecting the effectiveness of online learning. Active feedback, typically based on observing students' body language and facial expressions, is seen as important for effective learning (48). However, some students may struggle to understand during online sessions. Lenient instructors may not monitor student participation effectively. Boredom and attentional problems were

found to be positively correlated in a series of four studies (49–52), with a high prevalence of boredom in higher education. Additionally, scheduling challenges arise due to students and instructors being in different locations, hindering planning and potentially leading to weekend classes.

#### **External barrier**

Online learning offers advantages like accessibility from anywhere with a strong internet connection, in contrast to the need for physical presence in campus-based classes. However, Boca's study (53) and participants at UoC emphasised the benefits of face-to-face learning. Most respondents disagreed with the idea that e-learning can replace traditional teaching methods (53). Unfavourable factors for online learning include an unaccommodating environment, limited access to necessary equipment like laptops or computers (54), and financial challenges. Individual study methods are also crucial; some students find physical demonstrations more effective. Additionally, an uncondusive home environment, including the lack of a dedicated study space and disruptive family members, presents challenges.

#### **Internal barrier**

Despite the advantages of technology, students struggle to maintain focus and attention during online classes, often finding it easy to lose concentration (49). This pattern of content overload leads some students to turn to social media or online distractions to alleviate boredom or tension (51). Procrastination is also a concern in online classes, as students lack physical engagement with peers and face flexible deadlines, as noted in Lathrop's study (55).

#### **Technical problem**

Students are falling behind in their studies due to issues with poor internet connectivity, particularly in parts of Malaysia with geographical challenges. The sluggish internet speed during the MCO is

attributed to high usage and infrastructure problems. Participants at UoC, especially those in rural areas, share this concern. This issue is consistent with a study in Libya, where students expressed dissatisfaction with local internet quality for e-learning (47). Connectivity stability may vary depending on where students are located, as reported by Gonzales et al. (56) and Rasheed et al. (57) for home-based versus hostel-based students. Ismail et al. (54) further highlights the widespread problems students face with slow internet speeds or no Wi-Fi connection at all. These issues, emphasised by participants, disrupt material sharing, presentations, and the overall online learning experience.

### **Perceptions on Ways to Improve Quality of Online Learning**

#### **Technical support**

This study aligns with the recommendation by Mukhtar et al. (58) to expand the national telecommunications network for better internet connectivity. Chung et al. (29) also suggested this, despite private telecom companies offering free data daily to support online learning. They found it insufficient for students without Wi-Fi access. Standardising online learning platforms is another recommendation to avoid confusion, as suggested in this present study, and by Chung et al. (29). It aids students, especially those anxious about online learning, by ensuring consistency across platforms.

#### **Learners' adaptations**

In this study, working together through online tools was rated highly effective (59). A different survey found virtual lounges less effective, potentially due to different respondent categories. The undergraduates in UoC may have more time for discussions. Research by Aziz Ansari et al. in 2021 showed that students with dedicated study spaces had a more positive academic experience (60).



Student preparation, encompassing control, desire, self-efficacy, and self-directed learning, is crucial for online focus, similar to in-person classes. This aligns with research emphasising the need for self-discipline in time management and assignment submissions (11, 61, 62).

Improving student participation in online learning is crucial, as it impacts the learning environment. Ahn et al. (63) supports this, suggesting peer contact encourages participation. Additionally, reduced procrastination correlates with increased participation and better performance (64).

### **Instructors' adaptations**

Successful online learning relies on effective interaction between students and instructors, necessitating changes in roles and expectations. Chung et al. (29) suggests organising training sessions for lecturers to enhance their effectiveness in delivering online content, as adapting to this new norm may require time. Furthermore, a systematic review by Hamari et al. (65) highlights the effectiveness of gamification in education, offering a new approach for instructors to improve interactions with students during online learning.

Finally, instructor and student engagement rely on their motivation and interests. To ensure high-quality participation, instructors should ask more questions, as supported by a study that suggests it encourages learners (64). However, instructors should avoid dominating conversations, as research indicates it can discourage student participation (66, 67). In our survey, lecturers frequently questioned their students to understand their diverse learning styles. Michinov et al. recommended identifying and encouraging students who procrastinate at the beginning of online courses (64).

### **STUDY LIMITATIONS**

This study was greatly constrained by time and resources. As it is a qualitative study, participants have more control over the content of the data collected. Thus, results cannot be verified objectively against the scenarios stated by the respondents.

Moreover, sample size and its variation are also an issue in this study, participants were all from UoC, so the results are not statistically representative. All the interview sessions could only be done online due to COVID-19 pandemic which restricted face-to-face sessions, so the environment would have been slightly different compared to face-to-face settings. There have been few moments where interviewees' connection was lost due to technical issues.

Though there were few limitations, the research was able to be done smoothly without any trouble faced. Apart from those mentioned above, the research design and literature review were extensively revised by the researchers.

### **RECOMMENDATIONS**

The primary goal of this study is to evaluate the impacts of online learning on medical students based on their perceptions. Time restrictions meant that it could only be completed at UoC. This constraint suggests that by adding more participants from other higher education institutions, the results would be more comparable. To get a better understanding of the teaching style, more lecturers or medical graduates who had also been exposed to online learning during their clinical years can be recruited in future studies to provide a better view of the learning method. Research design should use quantitative analysis to support other confounding elements that may contribute to certain outcomes to better improve the study.

## CONCLUSION

In conclusion, most people still prefer in-person instruction over online learning due to the difficulties they encounter when taking online classes, some of which include a lack of focus and comprehension of the subject matter, a decline in effective communication between the students and instructors, and their living circumstances. Many agreed that online learning has an enormous impact on their clinical year as medical students due to lack of exposure. To sum up, learners' readiness is the biggest factor accountable for improvisation of online learning. Throughout this study, we can see the impacts of online learning vary among the clinical years' medical students at UoC. Most of the students are in dispute about proceeding with the classes via online as they will be at disadvantage.

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## ETHICAL APPROVAL

This study was registered with the University of Cyberjaya Research Ethics Review Committee (UOC/CRERC/ER/308), and ethical approval was granted from the University of Cyberjaya Research Ethics Review Committee (CRERC) in Malaysia.

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