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Digital Pedagogies in Cultural Heritage: Evaluating Creative Multimedia Integration and UI/UX Efficacy in Online Learning Environments

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Abstract

This study investigates the intersection of creative media design and cultural education, focusing on how interactive digital interfaces facilitate the transmission of traditional knowledge. This qualitative cross-sectional case study was conducted within a sociocultural theoretical framework. Researchers used a purposive sampling method. In-depth interviews were conducted with twelve university students from different cultural backgrounds in Karachi, Pakistan. The researchers used thematic analysis strategy to analyse students' perceptions, indicated that standard digital interfaces often fail to account for the sociocultural nuances of diverse learner groups. Findings suggest that high-fidelity multimedia elements significantly improve student retention of cultural nuances compared to text-heavy digital platforms. It is recommended that the quality assurance framework should integrate culturally aware engagement mechanisms to ensure effective learning outcomes.

Keywords: Creative Multimedia; Synchronous; Asynchronous; Quality of Online Education; Barriers in Participation

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Introduction

Individual's existing knowledge, experiences, and sociocultural norms of their community have a substantial impact on their online learning processes (Vygotsky & Cole, 1978). Cultural background influences learning processes in online sessions (Abid et al., 2021).

For students from different cultural backgrounds, online sessions can be challenging due to different expectations and different preferences for interaction and communication, and learning approach (Olson & McCracken, 2015). The term “cultural background” used in the context of this research is defined as: *“Culture comprises various factors, such as Birthplace, location of upbringing, gender, ethnicity, and language, which together constitute one's cultural background.”*

In the context of creative multimedia, online learning serves as a dynamic canvas where UI/UX design and interactive storytelling converge to preserve intangible cultural heritage. This includes the areas of online university education, online learning platforms, and professional certification (Statista, 2023). The market for online education is anticipated to keep expanding as a result of rising demand for flexible and remote learning options as well as technological improvements (Adeoye & Otemuyiwa, 2024).

This digital boom was bound to happen, but COVID just delivered it faster (Shah et al., 2023) and accelerated the adoption of online education, with the number of enrolled students in online courses increasing significantly. In the online education market, the number of users is expected to amount to 6.3 million by 2027 (Statista, 2023). Moreover, the recent resurgent conflicts globally and AI are drastically changing the future of learning (UNESCO, 2025). Therefore, it is crucial to ensure that the quality of that educational experience is in sync with the reality of the students' lives enrolled in online degree programs (Baker & Tukhvatulina 2023).

This emergency shift to online education presented many barriers for students and teachers, especially university students living in Pakistan (Iftikhar et al., 2023). Pakistan's federal and provincial governments manage education, providing a variety of online learning possibilities for its citizens. Online learning is currently available in Pakistan through a number of universities and educational institutes (Gohar et al., 2022). The transition from traditional face-to-face teaching to emergency distance learning was not smooth, with major barriers in educational, technological and infrastructural areas. However, despite initial reluctance, the institution, faculty and students adapted to change, realizing the benefits of distance online learning (Shah et al., 2023).

There is a need to correctly identify which courses can be taught online and should take steps to enhance their technological and infrastructural capacity (Iqbal et al., 2023). The consensus opinion seems to be for blended learning, with theory being taught online and practical and clinical components as face-to-face teaching (Shah et al., 2023). In higher education, research on interaction in online classes mainly focuses on students and teachers, while instructional design and technology (IDT) are overlooked (Abramenka-Lachheb & Ozogul, 2025).

The gap in current literature lies in the under-examination of how media-rich environments specifically impact the pedagogical delivery of cultural content. Based on earlier studies results, it is recommended to examine different aspects of students' interactions in the online learning environment (Majadly et al., 2024). This study aligns with SDG4 “Quality Education”.

Objectives and Research Questions

Objectives

The study aims to:

1. Discover how students' opinion on the quality of online learning varies between synchronous and asynchronous modes
2. Discover the obstacles that students have while engaging in synchronous and asynchronous online sessions with instructors with peers from diverse cultural backgrounds

Research Questions

The study was guided by these research questions:

1. What differences exist between synchronous and asynchronous modes in students' evaluations of the quality of online education?
2. When engaging in synchronous and asynchronous online sessions with instructors and peers from diverse cultural backgrounds, what kinds of obstacles do students perceive?

Literature Review

This literature review was conducted to provide context for this research by comparing, contrasting and criticizing existing research on barriers, quality, satisfaction, and pedagogy. The researcher identified gaps in previous studies in this literature review. Therefore, this literature review justifies the research question of this research.

Some past studies have focused on psychological and cognitive elements. Fatimi et al. (2025) explored gender-based anxiety and motivation. They explained how screen time affected self-regulation. Similarly, Hasan and Khan (2020) discussed the lack of socialization and face to face interaction as the core deficiencies.

Some past studies have focused on infrastructural and operational elements. Electricity, internet connectivity, and technical training were identified by Iqbal et al. (2022), Anwar et al. (2020), and Jumani et al. (2023) as barriers to successful online sessions. According to them, accessibility of the online platform is the first problem to be solved for providing quality education online.

Some past studies have focused on social elements. Majadly et al. (2024) found the participant's perception and demographic variable affect the interaction of students in online class. Moreover, participants' readiness to learn online impacts perception of online class.

Some past studies have focused on positive or mixed results. Butt et al. (2024) found a positive impact on academic achievement among students in Karachi. However, those students were dissatisfied with resources. Moreover, Haleem et al. (2021) found that if students are tech savvy, then they are satisfied with online education.

However, some past studies have focused on negative impact. Abbasi et al (2020) found more than 70% negative perception among students in Karachi. Iqbal et al. (2022) found that the majority of students refused to take online classes in future.

Some past studies have focused on the dual nature of online spaces. While online platforms seem to remove geographical barriers, cultural barriers still hamper online interaction. Taj (2023) noted that missed opportunities for deep interaction hamper the actual construction of knowledge. Moreover, according to Zhang et al. (2023), interactive digital media should be tailored to the specific cultural context to be effective.

Some past studies have focused on faculty support and instructional design. Abramenk-Lachheb and Ozogul (2025) found it necessary to analyse the interactive features of technologies and learning objects are necessary to design more intentional learning experiences.

Moreover, Méndez Rojas (2023), highlighted the constant need of teacher companionship among students to stay motivated. Teacher's support boosted interaction, although it did not make learning faster. Furthermore, Puiu et al. (2023) proposed a five-variable model for university managers.

They identified that the quality of education is linked to the digital skills of teachers and stress management skills of students.

Some past studies have focused on specific needs of diverse learners. Baker and Takhvatulina (2023) argued that degree programs should be redesigned for those with jobs and families by focusing on asynchronous delivery and alternative instructional methods. Mohammad et al. (2023) analysed the perception of diploma students. They noted that the prior experience heavily dictates a students' preference for online versus traditional modes.

Some past studies have focused on the digital divide and subject suitability. Iftikhar et al. (2023) used Heckman's treatment effect model and found that online sessions are suitable for theoretical subjects but not for numerical or technical subjects. Their study proved that a lack of gadget and internet access negatively impacts performance.

Recent frameworks in 2025 emphasise that digital cultural preservation requires more than digitisation; it necessitates 'embodied interaction' through immersive multimedia interfaces.

Methodology

The methodology of this study is replicable enough to be followed by other researchers for similar study in other cities. This study employs a qualitative approach with interpretivist philosophy, inductive reasoning and cross-sectional time horizon because it allows the researcher to consider the complexity of a social problem. The strategy of this research was case study to draw conclusions that may apply to broader situations.

Study Area: In this research researcher selected Karachi city of Pakistan as study area because Karachi is a multicultural city and students from other provinces and countries are enrolled in the universities of Karachi.

Population and Sampling: The population consisted of University Students from different cultural backgrounds in Karachi who had attended online classes at least once. The sample size was twelve. The sampling method was a purposive sampling method.

Data Collection Method: The researcher collected data from respondents with their consent and confidentiality through in-depth interviews in Urdu language to get their opinion in detail. Then the data was transcribed and translated in the English language.

Data Collection Tool: The researcher used a semi structured interview guide to collect data from respondents in alignment with research questions. The researcher also asked about their birthplace, location of upbringing, ethnicity, and first language. The researcher also noted the gender of respondents. **Data Analysis Method:** Thematic analysis followed a six-stage recursive process: data familiarisation, initial code generation, searching for themes within the interview transcripts, reviewing themes, defining naming conventions, and final report production.

Multimedia Instrument Design: Participants experienced Google Meet and Zoom as the online learning environment. Therefore, the researcher focused on the feedback about the features of these softwares such as integrated screen-sharing capabilities in synchronous sessions, synchronous mute control tool, recording functions for asynchronous sessions, and chatrooms. The majority of participants used mobile smartphones to attend online classes, few of them used laptops or tablets. Some of them used Wi-Fi and some of them used cellular mobile data to access the platform.

Results

The study sample consists of twelve undergraduate students from a university in Karachi. Their age ranges 18-24. The researcher also asked about the cultural background of these respondents. The cultural background of these respondents (students) is shown in Table 1.

Table 1. Demographic data of respondents (students)

Case	Birthplace	Location of upbringing	Gender	Ethnicity	First Language
1.	Larkana, Pakistan	Larkana, Pakistan	Male	Sindhi	Sindhi
2.	Karachi, Pakistan	Karachi, Pakistan	Female	Urdu Speaking	Urdu
3.	Karachi, Pakistan	Karachi, Pakistan	Female	Pashtun	Pashto
4.	Karachi, Pakistan	Karachi, Pakistan	Female	Urdu Speaking	Urdu
5.	Larkana, Pakistan	Larkana, Pakistan	Male	Sindhi	Sindhi
6.	Karachi, Pakistan	Karachi, Pakistan	Female	Punjabi	Punjabi
7.	Karachi, Pakistan	Karachi, Pakistan	Female	Sindhi	Sindhi
8.	Karachi, Pakistan	Karachi, Pakistan	Female	Baloch	Baloch
9.	Karachi, Pakistan	Karachi, Pakistan	Female	Urdu Speaking	Urdu
10.	Karachi, Pakistan	Karachi, Pakistan	Female	Urdu Speaking	Urdu
11.	Azad Kashmir, Pakistan	Azad Kashmir, Pakistan	Female	Kashmiri	Hindko
12.	Karachi, Pakistan	Karachi, Pakistan	Female	Urdu Speaking	Urdu

Participants also shared multimedia engagement with digital assets as shown in Table 2 in this study. Active participation was possible in synchronous real time video. Frequent reviews were possible in asynchronous recorded lectures. Participants used chatrooms for alternative ways of communication. The screen sharing tool was helpful in visual clarity. The online assignment submission tool was not very helpful, because submission failed due to technical error and limited time. Synchronous mute control tool blocked Interaction of participants with teachers. Cellular mobile data provided unstable internet connection to participants.

Table 2. Case specific Multimedia Engagement Matrix

Digital Assets	Multimedia Engagement Matrix	Case
Synchronous real time video	Active participation	1, 2
Asynchronous recorded lectures	Frequent reviews	2, 10
Chatrooms	Alternative communication	10
Screen sharing tool	Visual clarity	12
Online assignment submission tool	Submission failed	8
Synchronous mute control tool	Interaction blocked	10
Cellular mobile data	Unstable internet connection	7

Thematic Analysis

After analysis, a total of two themes emerged from the data about the influence of various cultural backgrounds on learning in synchronous and asynchronous online sessions. Those two themes are:

1. Students' opinion on the quality of online learning
2. Obstacles while engaging with instructors and peers

Theme 1- students' opinion on the quality of online learning: As shown in Figure 1. According to students, the quality of education is not satisfying. However, Participants reported that the cinematic quality and synchronised audio-visual cues (Creative Multimedia) enhanced the emotional resonance of the cultural material.

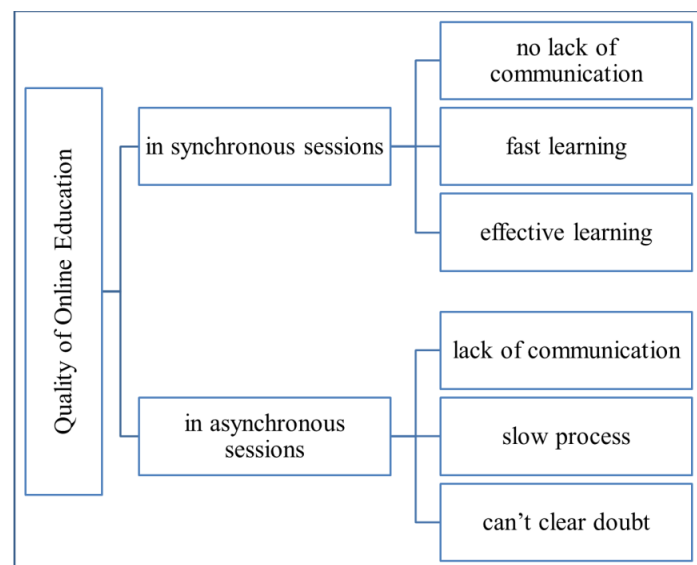


Figure 1. Conceptual Framework of Creative Multimedia Integration in Cultural Pedagogy

The UI/UX architecture played a pivotal role; intuitive navigation allowed users to focus on cultural narrative rather than cognitive load associated with interface complexity. As shown in Figure 2, students actively participate in synchronous sessions, which is the primary distinction in that learning process. Additionally, for synchronous sessions to be productive, students want a quiet setting.

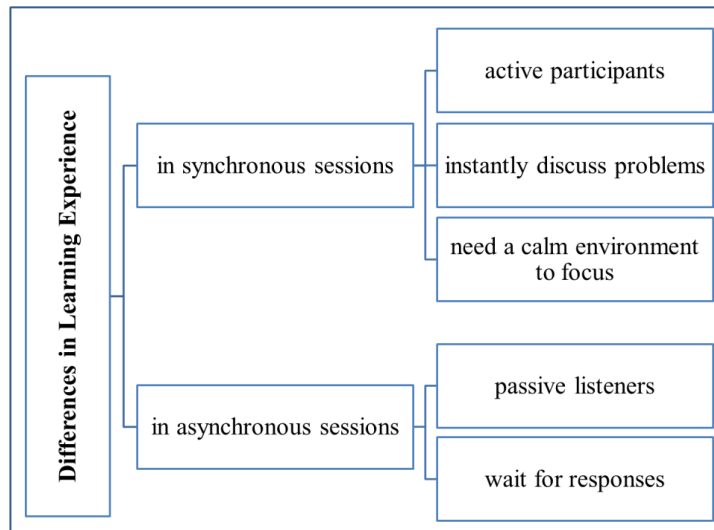


Figure 2. Main Differences in the Learning Experience

Respondents also shared some advantages that they associated with each modality in terms of educational quality, as shown in Figure 3. According to them, the advantages of synchronous online sessions are that students can have direct communication in real time. Synchronised online sessions provide a classroom environment. While in asynchronous online sessions, students can review and clear their thoughts by listening to recorded lectures repeatedly. Students can listen to recorded lectures at any time. Students can save important things independently. It helps in preparation for the exam.

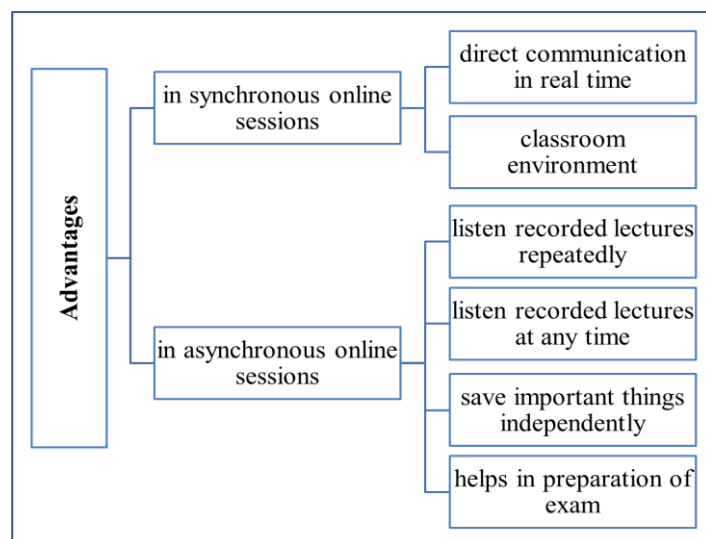


Figure 3. Advantages

As seen in Figure 4, respondents also mentioned certain drawbacks they connected to each modality in terms of educational quality. They claim that students who experience issues with energy, the internet, language hurdles, or other distractions find it challenging to participate in synchronous online sessions. When an instructor speaks quickly, synchronous online meetings might be challenging. Conversely, asynchronous online sessions have a communication gap. Students are unable to form friendships. No one can assist students. Students experience loneliness. An isolated setting is offered via asynchronous online sessions.

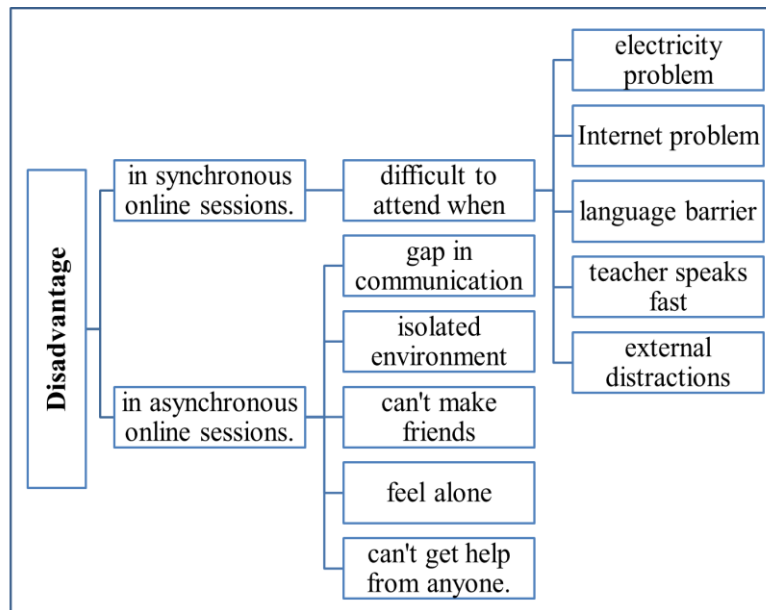


Figure 4. Disadvantages

For instance, it appears that the primary benefit of synchronous sessions in the context of Case 1's assertion is that they enable more active learning and conversation between students and professors. It's crucial to remember that asynchronous sessions have some benefits as well, such as the ability to study at one's own speed. As stated in Case 1:

"There is no communication breakdown between students and professors during synchronous sessions. Students participate actively in synchronous sessions whereas they just participate as passive listeners in asynchronous sessions, which is the primary distinction in that learning process."

Similarly, in the context of Case 2's assertion, it appears that the primary benefits of synchronous sessions are that students can learn more quickly and efficiently in these environments and that they can be more relevant and intelligible for them. It's crucial to remember that asynchronous sessions have some benefits as well, such the freedom to study at one's own speed and the capacity to

go over content more than once. It is ultimately up to each teacher or instructor to decide whether to employ synchronous or asynchronous sessions. As stated in Case 2:

“When opposed to asynchronous sessions, the quality of instruction in synchronous sessions is more comprehensible and relevant. In synchronized online sessions, students learn quickly and efficiently since lecturers answer questions in addition to imparting knowledge. The main distinction is that, as soon as they identify an issue, students may debate it in a synchronous environment and may even receive real-time answers. Teachers and students must wait patiently for one other's answers during an asynchronous session. Another distinction I've noticed is that, in synchronous sessions, students are accountable and committed to their studies since they are in a classroom setting, but in asynchronous sessions, they could not even show up for class. One of the benefits of synchronous sessions is that students and teachers may communicate directly and in real time. This facilitates faster learning and faster surpassing of expectations. In a similar vein, the benefit of an asynchronous session is that students can listen to a recorded lecture at a later time if they are unable to attend class at the scheduled time due to personal matters. By listening to lectures that have been recorded, students may go over and refine their ideas repeatedly. You can store significant items on your own and pick things up quickly.”

Case 3's statement highlights some of the challenges that students in developing countries can face when participating in synchronous online learning. One challenge is the lack of a calm environment in which to study. Students in developing countries often live in crowded households, and it can be difficult to find a quiet place to learn. Power outages are common in many developing countries, and this can disrupt synchronous online learning sessions. Finally, students in developing countries may also face pressure from family. This can make it difficult for students to focus on their studies. Despite these challenges,

“Studying in synchronous sessions requires a quiet atmosphere, and taking an online course is challenging when we have a joint system at home. Due to a power issue, we are unable to access the Internet and are unable to participate in synchronous sessions. In addition, family members put pressure on us to attend synchronous sessions while doing household tasks.”

Similarly, Case 4's statement provides a good overview of the disadvantages of synchronous and asynchronous online learning from a student's perspective. Disadvantages of synchronous online

learning are that some students may not be able to attend class on time. This may be due to factors such as time zone differences, internet connectivity issues, or other commitments. Students' environments may distract them from class. This may be due to factors such as noise, interruptions from family members, or other distractions in the home. In the words of Case 4:

“Some students may not grasp the material or may have queries that they are unable to answer during asynchronous sessions. Some students, in my perspective, struggle to attend class on time and in synchrony because they lack internet connection. The drawback of synchronous meetings is that some students may not be able to go to class on time or may be distracted by their surroundings, which makes it difficult for them to focus and comprehend the material.”

Additionally, according to Case 5, synchronous online learning has the drawback of being susceptible to technological issues like internet outages or audio/video issues. Teachers and students in various time zones may find synchronous online learning difficult. For some pupils, synchronous online learning may be too quick. Asynchronous online learning has the benefit of letting students learn on their own schedule and at their own speed. Students who have other obligations, including jobs or families, may find this useful. With asynchronous online learning, students can go over the content more than once.

Students who need to review a concept or who are getting ready for an exam could find this useful. Additionally, Case 5 states that one of the drawbacks of asynchronous online learning is that students may find it challenging to interact in real time with instructors and fellow students. This may result in a lack of cooperation and communication. Students may find it challenging to maintain motivation and engagement in asynchronous online learning. This is a result of asynchronous learning environments' lower levels of social connection and accountability. For some pupils, asynchronous online learning might be too sluggish. According to Case 5:

“Synchronous learning is too fast. You catch some ideas and concepts, and some of them will be missed. But asynchronous is a slow process. And you can learn it according to your capabilities because, in synchronous sessions, not everyone is so intellectual to grasp ideas so quickly. A synchronous system is the ideal option if you are accustomed to in-person instruction and would want to attend lectures from your preferred instructor. An asynchronous system's drawbacks include a poor communication response rate and a sense of isolation.”

Comparably, from a student's point of view, Case 6's statement emphasizes some of the advantages of synchronous online learning as well as the main difficulties of asynchronous online learning. Students who participate in synchronous online learning can ask questions and receive prompt feedback from their instructors and peers. Synchronous online learning settings allow students to interact with one another and form friendships. Additionally, Case 6 notes that in asynchronous sessions, students may feel alone, unable to form friends, and unable to seek assistance from anybody. However, it is important to note that there are many ways for students to connect with each other and get help in asynchronous online learning environments. In the words of Case 6:

“Synchronous sessions are good because, in class, we can ask questions and make friends, and in asynchronous sessions, we can't make friends, and we feel alone and can't get help from anyone.”

Additionally, Case 7 raises some valid issues on the advantages of synchronous online education. Synchronous online learning has the benefit of enabling students and teachers to communicate in real time. This can lead to a more engaging and interactive learning experience. Teachers can provide students with prompt feedback on their work. This can assist them in rapidly recognizing and fixing their errors. Students can collaborate in real time on tasks and challenges. This can help them learn from each other and develop their collaborative skills. One drawback of synchronous online learning is that technical issues like internet outages or audio/video issues can cause disruptions. Asynchronous online learning has the drawback of making it challenging for students to interact in real time with instructors and fellow students. This may result in a lack of participation and cooperation. Students may find it challenging to stay engaged and motivated in asynchronous learning environments. It can take longer for students to get feedback on their work from their teachers. In the words of Case 7:

“The quality of online education in synchronous sessions often benefits from real-time interaction and immediate feedback. In asynchronous sessions, there is a lack of engagement and immediate feedback. The primary benefit of synchronous learning is that it allows us to ask questions on lectures in class. On the other hand, synchronous learning has the drawback of not having internet access at home.”

Furthermore, the sentence in Case 8 emphasizes that pupils may struggle if they do not speak the language of teaching well. In the words of Case 8:

“In synchronous and asynchronous sessions, the biggest problem is the language barrier. If we do not understand the language, then we cannot understand things.”

A thorough and perceptive summary is given in Case 10. One drawback of synchronous online learning is that some instructors may talk excessively rapidly, which makes it challenging for students to comprehend and take notes. During synchronous sessions, some lecturers could be reluctant to respond to inquiries, which might irritate students. Asynchronous online learning has the benefit of letting students learn on their own schedule and at their own speed.

Students who have other obligations, including jobs or families, may find this useful. With asynchronous online learning, students can go over the content more than once. Students who need to review a concept or who are getting ready for an exam may find this useful. Students can interact in writing with their instructors and peers through asynchronous online learning. This can be helpful for students who are afraid of speaking in class. In the words of Case 10:

"Synchronous sessions are beneficial, but we are limited in what we can remember. The teacher speaks quickly, so we are unable to write. How can students learn what they don't grasp when some lecturers dislike being questioned during lectures? The primary benefit of asynchronous sessions is that the lecture may be stored securely and accessed at any time. Students can leave comments in the asynchronous session chat area if they are hesitant to speak during synchronous sessions, and they can get a lot of help from the Internet, which I use myself. The disadvantage of synchronous sessions is that, in some lectures, some discussion is relevant and some is not."

Theme 2- Obstacles while engaging with instructors and peers: As seen in Figure 5, respondents discussed a variety of obstacles they encounter when taking part in synchronous online sessions with instructors and peers from various cultural backgrounds. They contend that lecturers are unable to take introverted students' issues into account during synchronous sessions. Classmates may be boisterous at times. Teachers occasionally switch off the microphone. Participation is often hampered by poor Internet connections, technical problems, and language hurdles. Sometimes gestures are misinterpreted. Some students in joint families lack the privacy necessary to fully participate in synchronous online lessons at home. Some students work or perform housework. Thus, they have time conflicts. In a similar vein, they discussed some of the obstacles they have while engaging in asynchronous online sessions with instructors and peers from diverse cultural backgrounds. They claim that occasionally the teacher's voice is indistinct during asynchronous sessions. There are problems with technology, language obstacles, and communication barriers. It makes one feel socially isolated. Additionally, they offer concrete situations and examples when these obstacles were very noticeable in either mode.

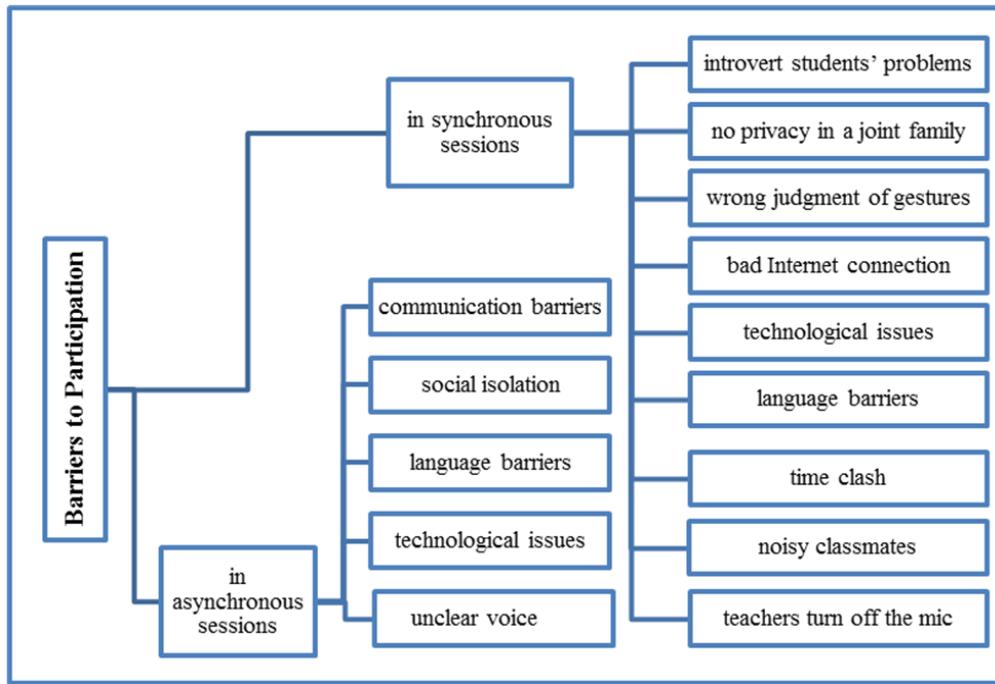


Figure 5. Obstacles while Engaging with Instructors and Peers

Case 1 describes two communication barriers in asynchronous sessions: the language barrier and the cultural barrier. Students may not be familiar with the cultural context of the lecture, which can make it difficult for them to understand and engage. This is a common challenge for students. In the words of Case 1:

“Teachers are frequently unable to accommodate every student's approach during synchronous sessions since most students are naturally hesitant and unable to articulate and discuss the issues they are encountering. Students' aptitude and interest are impacted by the communication barrier that arises from not knowing every language used in the lecture during asynchronous sessions. My cultural background is Sindhi, and I participated in these sorts of sessions early in my academic career. In online classes, students are required to speak in a certain language that the instructor chooses. I was unable to choose the point because of this. My introverted personality prevented me from asking”.

Case 2 is fortunate that they have not experienced but agreed that language barriers can prevent students from participating in the learning process and lead to social isolation. Students who are weak in the language of instruction may not be able to understand the lectures, complete the assignments, or participate in class discussions. This can make them feel isolated from their classmates and the instructor. Cultural differences can also create challenges. This can lead to misunderstandings and conflicts. In the words of Case 2:

“I frequently observe language barriers as an issue in both synchronous and asynchronous sessions because they prevent students who are not proficient in the language from engaging in the learning process, which ultimately results in social isolation, thus resulting in an inability to grasp the knowledge being imparted in these sessions. Furthermore, physical gestures sometimes create disharmony in the sessions, as gestures that are perceived as normal in a particular culture can be offensive to others.”

Two difficulties that students may encounter in synchronous online sessions are described in Case 4. First, comprehending the subject and contributing to class discussions may be challenging for students who do not comprehend the language of instruction. Second, even when some students may not speak English well, professors could nevertheless expect all of them to contribute to class discussions in the language. Students may be prevented from expressing their opinions as a result. Case 4 also highlights a problem that students may encounter during asynchronous online sessions: technological issues, such data loss, might impede their development and learning. According to Case 4:

“Sometimes a few students and teachers have the same language, like English. Other students can’t understand English properly, so when they discuss anything in class in English, many of the students can’t understand what is going on in class, so they can’t understand the topic properly. Sometimes during synchronous sessions, students want to discuss pertinent matters with their instructors, but teachers want everyone to respond in English, which prevents them from doing so because of language problems. My buddy prepares questions for her thesis over asynchronous sessions, but the information she gathered was inadvertently erased, and she is unable to recover it so she may start over from the beginning.”

Case 7 illustrates how technological issues, such power and internet disruptions, can interfere with learning. As stated in Case 7:

“I had a lot of internet problems and a light problem at home one day during a synchronous online session, which made it difficult for me to hear the professors well. I was also unable to respond to the teacher's questions because of the poor internet. It was an unpleasant experience.”

Case 8 outlines a few difficulties that students may encounter when taking classes online. As per Case 8, kids who reside in joint households would not have the privacy necessary to engage in

online learning or study. Technical issues, such as internet outages or issues with the online testing platform, can also make it impossible for students to finish examinations or turn in their work on time. In Case 8's words:

“We live in a joint family in our culture. So, there is no privacy. It happened to me that I had to submit an online test. The test, which had 30 marks, was filled out and sent within an hour. I filled it out and sent it, but it was not sent due to technological issues.”

Some of the difficulties that students may encounter in synchronous and asynchronous online sessions are detailed in Case 10. Noisy peers might make it challenging to hear and comprehend the teacher during synchronous sessions. Additionally, professors occasionally dislike it when students ask questions during lectures. This can create an environment where students feel uncomfortable asking for clarification, which can lead to misunderstandings. In asynchronous sessions, sometimes the teacher's voice is not clear. This can make it difficult to understand the lecture. Sometimes, the lecture is not comprehensive. Students may have difficulty understanding the material:

“Some lecturers dislike it when students ask questions during synchronous sessions, which makes it difficult to understand the lecture. The teacher's voice might be unclear at times. During a synchronous session last semester, one teacher's talk was completely incomplete. Exams were coming up. I used the internet and a few pals to assist me prepare the paper. One of our classmates started making a lot of noise while we were studying on Zoom, which caused the class to become quite disrupted and all of the students began making jokes unrelated to the subject at hand. When instructing on Zoom, some professors switched off the microphone, which caused the pupils to only listen to the instructor without posing any questions.”

The difficulties with accents in synchronous online conversations are discussed in Case 12. Students may find it challenging to comprehend their professors and peers due to accents, particularly if they are not accustomed to hearing them. Additionally, Case 12 notes that they struggle to comprehend subjects taught by instructors from diverse cultural backgrounds. This is because teachers from different cultural backgrounds may have different teaching styles and expectations. In the words of Case 12:

“One time during a synchronous session, my teacher was dictating something to us, and he kept saying the word C-O-D-E, which didn't make any sense since it was not related to the topic. A few minutes later, a fellow classmate asked about it, so he spelled the word C-O-U-R-T, in different accent.”

Contextualising the Findings with Past Research

The replay feature, which enables students to access lecture slides and recorded video at a later time to review the courses, and the flexibility of time, which enables them to access the lecture materials whenever there is a dependable internet connection, were cited by students as the two most significant benefits of online learning. Conversely, the most common barriers to online learning were a lack of self-discipline and an inability to focus during online sessions. In a similar vein, the great majority of students in a previous study favored synchronous learning and desired access to lecture slides and recorded videos for topic revision after class (Mohammad et al., 2023). But according to a study, asynchronous sessions are more flexible (Cervatiuc, 2022).

Similar to this study, students who participated in synchronous and asynchronous online sessions felt certain kinds of obstacles. According to a research, students frequently believe that asynchronous learning lacks personality, interaction, and support when there is no real-time contact (Grammens et al., 2022). But according to a research, using webcams in synchronous sessions led to opposition and conflicts with students' cultural norms (Salih & Omar, 2023). According to a study's findings, students still received a top-notch education despite challenges they faced while taking classes online because they had the support of their teachers, all the resources they needed to learn, a device to connect from, and a very strong internet connection (Puiu et al., 2023).

Scope, Limitations and Directions for Future Research

The purpose of the study was to highlight the perception of students about the quality of online education and barriers in participation due to cultural diversity. This study reveals that traditional approaches to student engagement in digitalised classrooms are culturally insensitive. The quality assurance framework should integrate culturally aware engagement mechanisms to ensure effective learning outcomes. This research will be beneficial for teachers about how they can adapt their approaches to teaching to better meet the needs of students from diverse cultural backgrounds in synchronous and asynchronous online sessions.

This research has contributed to the state of the online education field by highlighting the challenges about online education. While this study focused narrowly on the students of Karachi, Pakistan only, the insights could be helpful in understanding the issue in a global context, because global online learning clearly contains the same sociocultural issues. These highlights would be helpful for stakeholders to understand these problems from the perspective of students of different cultural backgrounds. The findings of this study confirm the assumptions of sociocultural theory. Stakeholders may consider these challenges while constructing a framework for global online learning to avoid any unintended barrier in participation.

Conclusion

It is concluded that synchronous sessions are faster and more effective, but poor in quality. Students perceived differences in the learning experience between synchronous and asynchronous online sessions. Students also found that asynchronous sessions are a slow process and that students cannot clear their doubts due to a lack of communication. The study concludes that the efficacy of digital cultural education is inextricably linked to the sophistication of its multimedia delivery. Future research should explore the role of Augmented Reality (AR) in deepening the immersive quality of these digital cultural interventions.

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