

Journal of Law & Social Studies (JLSS)

Volume 4, Issue 2, pp 346-360

www.advancelrf.org

Exploring the Determinants Affecting Synchronous E-Learning During COVID-19 Pandemic: A Case Study of Southern Punjab

Farah Irshad (Corresponding Author)

Ph.D. Scholar,

Department of Communication Studies, BZU, Multan.

Email: farazkhakwani5@gmail.com

Mustanir Afzal Khan Lodhi

Assistant Professor,

Department of English, BZU, Multan.

Email: Mustanir42@gmail.com

Muhammad Hashaam Ali Khakwani

Advocate District Court,

LLB, Gillani Law College, BZU, Multan.

Email: hasham.khakwani85@gmail.com

Abstract

COVID-19 has damaged most of the institutions in the world. Whereas education is the only paradigm which was transferred to online mode in most countries; thus, the Pandemic outbreak converted the world into a virtual society. This study aims to understand the challenges faced by BZU (HEI's) students in Pakistan while switching traditional learning to online learning. The purpose of this study is to investigate the learners' new experiences in synchronous online education and assess the practicality of the virtual synchronous method of learning. The current study is conducted under the qualitative research paradigm, using in-depth interviews to collect data and thematic content analysis techniques for analyzing the data. The result showed a digital divide and lack of ICT skills hinder this virtual process's success. There is a crucial need to establish an excellent infrastructure to promote online learning on a routine basis so that education institutes can immediately switch from brick-mortar to click-mortar learning systems in emergent situations.

Keywords: COVID-19, E-learning, Synchronous learning, Digital divide and Rich media

Introduction

COVID-19 has been declared a global pandemic due to its lethal values (Ministry of Health, 2020). Governments of all 150 countries of the world declared the lockdown to prevent the spread of this contiguous disease (Bourouiba, 2020); hence, the outbreak of the pandemic has transformed the world into a virtual society (Reddick, 2020). The education sector is primarily affected second to the health sector during COVID-19 (Telli Yamamoto & Altin, 2020); therefore, authorities decided to shift the mode of education from traditional classroom education to online learning globally (Sahu, 2020). Synchronous and asynchronous are two modes of online education used to deliver information globally, including Pakistan. In the synchronous mode of e-learning, students and teachers share a

virtual classroom within the same time frame but are geographically dispersed (Cloete, 2001; Hrastinski, 2008). Rich media is used to deliver the subject content, which is best to simplify the complexity of teaching materials and the immediacy of feedback due to its audio and visual characteristics (Sun & Cheng, 2007). Technology and media come together explicitly designed to form rich media (Winarto et al., 2020).

Information is knowledge, and knowledge is power. Nowadays, digital and media technology is considered information technology (Yang & Cernelius, 2004) in the 4th Industrial Revolution. However, the COVID-19 outbreak forcefully shifted the world into the 5th Industrial Revolution, where no one could survive without ICT devices and internet. Pakistan is a developing state and has less technological device usage in the educational area. However, teachers and students are still using ICTs for limited educational needs (Farid et al., 2015), owing to the enormous economic gap between developed and developing countries (Subedi et al., 2020). The inequalities between high socio-economic status, low socio-economic status, and geographical disparities account for the digital gap; furthermore, this digital gap increases the hindrance in ensuing online education (Reddick, 2020). According to a recent report, 77% of Pakistani students are reluctant to continue with online classes in future (Abbasi et al., 2020); hence, exploring the factors of students' dissatisfaction towards online education is a dire need of time. As Pakistan is a developing country, it is essential to determine the relationship between social status and media usage issues under the theory of Knowledge Gap and the Digital Divide (Hargittai & Hinnant, 2008). Furthermore, how this digital divide can become a hurdle or barrier in effective communication because after the inclusion of the internet with media devices, there is a drastic shift in the media used for different purposes, and this unequal use of the internet emphasizes disparities in society as well (Wei & Hindman, 2011).

According to the research context, we want to explore the student's issues regarding synchronous e-learning. Therefore, this research explores the issues regarding synchronous education in students' perception to prepare Pakistani students for virtual society to find whether the digital divide is the hurdle, or the issues created through the media use itself.

Objectives of the study

- The study of digital issues met by Pakistani students in synchronous communication during COVID-19
- To identify the barriers of effective communication between teachers and students during online classes through rich media under the concept of effective communication model

Literature Review

Technologies advancement and social media are the optimal solutions to maintain the learning process in exceptional emergencies such as the COVID-19 Pandemic. Therefore, there is a requirement to understand different hurdles related to technology, finance, skilled instructor, and learning to develop an efficient pedagogical infrastructure for e-learning (Al-Balas et al., 2020). Information science (IS) and Learning Science (LS) expertise are considered vital evidence to ameliorate learning designs, particularly in relation to digital discrepancy that students face during the COVID-19 (Fujita, 2020). Hence, network failure and weak bandwidth negatively impacted MOODLE (Modular Object-Oriented Dynamic Learning Environment) usage, which requires robust network connectivity and signals (Maphosa et al., 2020). The digital divide is still occurring; hence, the economic costs and connectivity concerns are critical concerns for the students during the online education process (Gay, 2020; Kuika et al., 2020; Pearson, 2020).

The attitudes towards e-learning had shifted positively; the main advantages of e-learning are less travel, saving in time and money, better flexibility, and the main handicaps are less personal interface and more technical obstacles (Froster et al., 2020). In contrast, inter-professional online learning delivery mode can be significant and beneficial in education institutes (Prasad et al., 2020). In reality, different factors influence successful e-learning, such as internal (attitude, self-efficacy, access), external (social support) (Mutambik et al., 2020), boredom, and anxiety owing to low income and less affordability of quota packages. Therefore, disparities in geographical locations cause significant hindrances to access internet signals (Simamora, 2020). Due to the underlying gap of economic equalities, ineffective e-learning systems, and fear of the academic loss, students experience mental pressure caused during COVID-19 (Hassan & Bao, 2020; D'Souza et al., 2020).

The synchronous mode of e-learning is better to enhance the personal participation and interaction between students and teachers. However, asynchronous e-learning improves cognitive participation but isolates the learner (Hrasky, 2008). Educational institutes primarily use synchronous e-learning that increases students' motivational level because of its access characteristics of a geographically dispersed audience (Hernandez & Florez, 2020). Furthermore, there is a direct relationship between 'personal creative performance' and 'supportive environment,' hence, personal creative performance is less controlled by supportive teams and lesser hindrance caused by the organization (Chang & Yu, 2015). However, poor internet connection and misunderstanding of the task became students' issues (Rinekso & Azimah, 2020). However, choosing the correct method and media to deliver the specific content is crucial in reducing the content's equivocality (Lange & Costley, 2019; Nikmah & Azimah, 2020). The educators should use different strategies to improve online education effectiveness, such as delivering the content through media as in the traditional classroom, interactive sessions (discussion and feedback), and mixed learning tools (Yulia, 2020; Hsieh & Tsai, 2012; Mertens, 2010; Kiernan, 2020). There is significant evidence that web-conferencing-based learning setting in interactive instructional education was higher in satisfaction than direct learning style (Chen et al., 2011). Whereas specialists from different regions, as an 'e-guest,' quickly approach the students from far away, that would not have been possible in a traditional classroom (Fulton, 2020).

ICT mediated learning can cause the cognitive divide with the limited cognitive skills as this ICT mediated learning place in self-directed learning. However, the brain has the outstanding quality of learning new skills with the passage of time and personal interest (Chinien & Boutin, 2003). Previous literature also emphasized that the digital and technological divides are not just about availability or use of digital technology, but these are about being able to integrate digital technology into substantial social practices (Livingstone & Helsper, 2007; Morganti et al., 2014; Warschauer, 2002) and to gain advantages of it (Song et al., 2020). However, to lessen the difficulties caused by this new mode of learning, the researchers will have to put more effort into finding ways to categorize them more clearly and form new strategies through Government and educational policymakers for adequate infrastructure and training programs to overcome these challenges.

Conceptual Framework

Synchronous e-learning has two essential elements (i) digital devices (affordability, connectivity) and (ii) rich media (audio/visual access to a different location in real-time). Therefore, it is imperative to explore the issues regarding digital access, connectivity, and rich media use (equivocality dimension that is equal to interactive learning) for effective communication during COVID-19. So, the researcher chose these two theoretical frameworks: the knowledge gap hypothesis (Tichenor et al., 1970) and media richness theory (Lengal & Daft, 1984) to rule out the barriers in effective communication during synchronous e-learning. The following conceptual model is formulated based on the Knowledge gap hypothesis and Rich media theory.

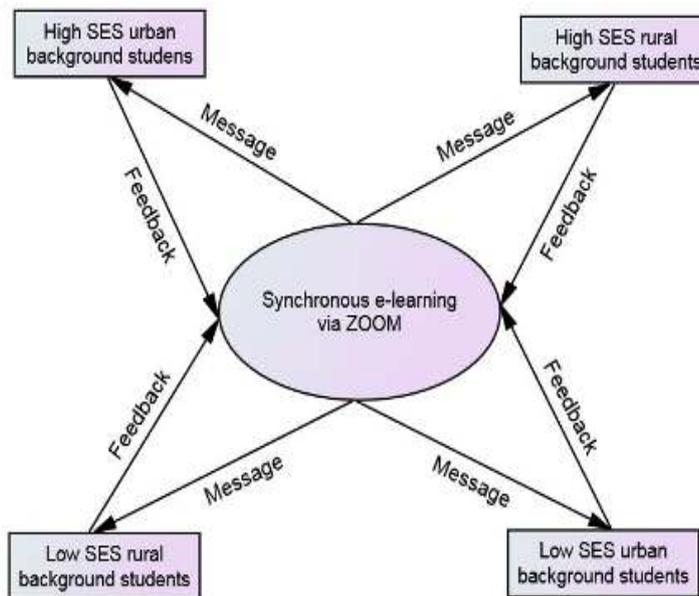


Figure 2.2 Conceptual Framework Based on the Digital Divide and Rich Media

Figure 2.2, The conceptual framework explicit the research purpose that how these four types of different segments of society perceive and interpret their experiences during synchronous e-learning scenario in the context of COVID-19 in Pakistan. Zoom is a channel that is used by teachers (sender) to send their subject information (message) towards students (receiver), and students give feedback to the sender through a channel. Thus, the process of effective communication will be completed. The researcher will explore the issues during synchronous e-learning from students' perspectives under this conceptual framework.

Research Question

1. What are the issues faced by HEI's students who belong to low SES and high SES from the rural background during synchronous e-learning?
2. What are the issues faced by HEI's students who belong to low SES and high SES from the urban background during synchronous e-learning?
3. What are the experiences of HEI's students regarding rich media as it reduces the equivocality of their subject content?

Research Method

The qualitative research approach was adopted to explore the aspects of people's perceptions, feelings, and behavior (Morse, 1991), related to online learning and the barriers which create dissatisfaction. Entire HEI's students of Bahauddin Zakariya University, Multan, who were enrolled from March 2020 to February 2021, are considered the current study population. The convenience sampling technique was employed to draw the sample for this project. The researcher selected 8 participants from the different departments of the higher educational institute (BZU), Multan. These participants are the users of digital devices. Participants' information and characteristics are placed in tables 1 and 2.

In-depth Interview participants	Total IDIs =8
---------------------------------	---------------

Junior HEIs students	4
Senior HEIs students	4

Table 1: Study participants for in-depth interviews

Gender	M-4
	F-4
Age	22-25 (4)
	25-35 (4)
Education Level	BS (4)
	Ph.D. (4)
Socioeconomic Status	Low Socioeconomic (4)
	High Socioeconomic (4)
Location	Urban (4)
	Rural (4)

Table 2: Participant's characteristics

The researcher will infer the high and low socioeconomic status during in-depth interviews with David et al.'s "Measuring socioeconomic status and inequalities" index.

Data Collection Method

The in-depth interviews method (Patton, 1987) is used for extracting comprehensive knowledge and identifying core phenomena during one-on-one long-duration meetings with the participants' understudy. Therefore, participants were motivated and encouraged to talk in-depth about the issues under investigation. Interviews were conducted till this reached saturation (Marson, 2010; Charmaz, 2008).

Data Collection Procedure

A semi-structured interview protocol guide was initiated to conduct the interviews of university students' perspectives to explore the participant's views or experiences regarding their synchronous (real-time) classes during COVID-19 and understand their main issues so the policy makers can resolve their drawbacks. First, the participants of in-depth interviews were identified and informed about the research goals. Interviews were scheduled as per participants' convenient days because universities were officially closed due to an outbreak of COVID-19. Therefore, it was challenging for the researcher to contact the participants and interview them. Before conducting the interviews, the researcher explained the study objectives to the students and gained their consent. Then, participants agreed to audio-record their experiences of the under-observed phenomenon. The study investigator conducted the interviews with traditional face-to-face settings and managed a quiet space to minimize distraction during the interview. The interviews were conducted in Urdu, and every interview lasted around 30 to 45 minutes duration. Participants were assured that their information remains confidential and that no identifying features will be mentioned in the transcript. Moreover, the current project only identifies the semantic codes and themes that mean explicit and surface meanings of the data; therefore, latent codes and themes will not be captured.

Data Analysis Technique

This project used the grounded theory data analysis technique for data coding. After collecting data from the participants, three coding steps, open, axial, and selective coding, were used to emerge the core theme (Strauss & Corbin, 1990).

Data Analysis

The thematic content analysis technique is used to analyze the collected data manually. Firstly, the audio recordings of the interviews were transcribed and translated into English language. In the first step of decontextualization, interview transcripts were read several times. Then the transcribed text was turned into 'semantic units,' later summarized and labeled with codes without damaging the study context. In the second stage of recontextualization, codes were assigned to place groups into identical categories. Similar categories were assimilated under main themes and sub-themes in the final stage

Results

Based on the collected data and thematic analysis, three major themes were identified

- i. Technological issues
- ii. Invalid e-learning infrastructures
- iii. Digital divide issues.

Hence, the themes are categorized and placed in Table 3.

Themes	Sub-themes or Categories
Technological issues	1-Less skilled instructors and students related to technology use. 2-Attitude flexibility towards technology 3-Focus issues during digital learning

Invalid e-learning infrastructure	1-Invalid instructional course design 2-Interactive sessions during synchronous e-learning 3-E-monitoring and Evaluation issues 4-Time management
Digital divide issues	1-Connectivity and signals issues 2-Electricity issues 3-Financial affordability issues

Table 3: Themes and Categories

Theme 1: Technological Issues

Less Skilled Instructors and Students Related Technology

The study participants shared that the e-learning media tools, including Zoom, were not embraced before the lockdown. Instructors were used to delivering their lectures based on traditional personalized interactive learning settings. The new mode of e-learning was used on an emergency basis, and students were not very familiar with the technologies regarding formal educational lectures. Moreover, most universities did not socialize on those e-learning platforms and arrange workshops to train their teachers and students to use these e-applications to their full specifications. Highlighting these points, a respondent stated:

"Students are guiding the teachers on what buttons to press to execute particular actions. Sometimes they mute themselves or accidentally turn on their camera without knowing it. As a result, most teachers cannot operate the share screen functions or the whiteboard option for better delivery of lectures." (IDI-1,7)

"Some instructors happen to not have any experience in delivering online lectures. During e-classes, technical problems are the main cause of time wastage which we suffer the most." (IDI-3)

Attitude Flexibility Towards Technology

Attitude flexibility is more valuable feature towards e-learning during COVID-19 because Pandemic turned e-learning from an option to support face-to-face teaching into a crucial reality. Attitude defines the people's feelings, positive and negative, regarding the behavioral interaction and performance towards following a new system. For example, students expressed their views regarding synchronous e-learning positively and believed that e-learning is needed during the current Pandemic; however, students face different behavioral and usage issues because it was initiated without establishing a good infrastructure and training that reduces negative attitudes towards adopting new ways of learning. Respondents highlighting their perspectives about their adaptability of e-learning is evident from the following statement:

"The decision was right instead of completely shutting down the education, but our expectations with online classes were not met. We faced many difficulties. The decision was no doubt good, but the implementation was not. If we enroll in a course, the online classes ensure graduation will not be delayed due to this Pandemic." (IDI-6)

"If the online classes were not executed and completely isolated, it would have caused them to fall into depression more often. Online classes helped continue the education process. Before this, we were not relying on the internet, but now we rely on the internet for education, research, and other aspects of education. We are familiar with different search engines, YouTube, etc." (IDI-8)

Focus Issues During Digital Learning

Most participants share that the focus on the content during e-learning is distracted due to different notifications, message alerts, and calls. However, students are conscious and focused during face-to-face learning because they are directly connected with their teachers. Respondents express this experience with the following statement:

"The notifications of messages and apps, some are essential that I have to reply at that time, or when you receive a call, the data connection is interrupted. So, it causes a hindrance in continuous focus because I have to do the other tasks as well". (IDI-4)

Some contextual interruptions cause the focus to get interrupted. For example, in Asian countries where the collective family system functions, studying from home may not be taken attentively because of distracting noises and attention-driven family agents.

"In contextual interruptions, I can count people barging in the room and the street vendors passing by the house in the street making noise or chanting the products they must sell. I have a small house, and my room is next to the terrace; it creates an easy target for the street noise." (IDI- 1)

Theme 2: Invalid E-learning Infrastructure

Invalid Instructional Course Design

Some participants mentioned that the informational content was not designed or presented according to the medium. For example, teachers delivered their lectures through audio. In contrast, they can visually present their content pieces of information, which may help reduce the content's ambiguity entirely. Highlighting this point, a respondent mentioned:

"We need to develop instructional course design that helps in visual, graphs and screen shares, which are essential to deliver the concept in the content that will overcome the learners' ambiguity." (IDI-4)

One study participant mentioned that invalid instructional course design is more imperative for practical subjects than theoretical subjects. Different sensory requirements are mandatory for practical subjects. Selection of delivering informational mode and developing a specific instructional course design related to course nature is crucial during e-learning. Visual content should be mandatory with an audio explanation for technical courses in e-learning.

"Our teachers do not use the whiteboard option; they either use a slideshow or solve it over a page or a register in front of the camera. As I have mathematics as a subject that demands more sensory requirements. In physical classes, professors are used to solve problems on the board, and then you are asked to solve problems in front of him. However, in zoom classes, it is not the same as trying to understand how to solve the problems and then solve them independently in front of a camera." (IDI-3)

"For me, online lectures seem to be more helpful for theoretical understanding of the content, but it is less helpful for mathematics and other technical courses." (IDI- 8)

Interactive Sessions During Synchronous E-learning

The participants of the current study attending synchronous classes are using the Zoom platform. Zoom can connect with people or groups of people in real-time and share information through audio and visual content. All the participants shared their experiences towards synchronous e-learning. Therefore, it has the opportunity of the immediacy of feedback to reduce their ambiguity or equivocality of the content. Furthermore, interactive sessions during e-learning are considered very effective due to the student's active participation and seeking the answers to growing questions in real-time, which helps simplify the contents for the learners. Highlighting this view, a participant expressed:

"Sometimes teacher tells us to provide them with feedback, and other times they can call the roll numbers or the names to answer specific questions regarding the feedback. (IDI,7)

Another participant stated this point:

"We had interactive sessions. The teachers are mostly trying to engage students by expressing their points of view and clarifying any ambiguity we had on that particular topic". (IDI-4)

E-monitoring and Evaluation Issues

The traditional education systems make sure that education occurs under suitable conditions, a range of measures are addressed to ensure that the provided education achieves the required objectives. The traditional school system also structures systematic monitoring and evaluating makes it possible to measure class attendance and students' progress. Teachers design and carry out assessments of learning improvement and introduce remedial measures. Participants expressed that the monitoring and evaluation system does not exist and falls short in the current scenario because the institute's management believes that this situation is temporary. Students show reluctance to attend online classes, and there are no specific criteria developed for assessing their educational activities. Highlighting this argument, a respondent stated:

"We are being monitored in traditional classes, and the instructor is supervising the participation. However, in online classes, the supervision is not so compelling, so the students do not participate correctly as per the demand of the course." (IDI)

Another participant endorsed the statement:

"We are being monitored in traditional classes, and the instructor is supervising the participation. However, in online classes, the supervision is not so compelling, so the students do not participate correctly as per the demand of the course. So mostly I sleep after joining the Zoom link or keep busy other activities." (IDI-7)

Time Management Issues

Virtual classes take about the similar amount of time as traditional on-campus classes. However, online classes require more time in comparison to on-campus classes. Therefore, online classes require good time management skills. Respondents generally referred to as the sub-theme, time management issue as a leading problem. Moreover, they all have similar opinion that online sessions

save time of traveling and waiting for the other classes on campus. All the participants shared their experiences towards time management that online classes always exceeded their allocated time, and lecture timings are set according to the convenience of the instructors. This time mismanagement negatively affects the e-learning system. Respondent of the study highlights the argument:

"Teachers always took classes according to their convenience. They never paid attention to the flexibility of students. It will be worth mentioning here that teachers did not adhere to schedule established by official authorities, rather the online classes were run by their own will (e.g., sometimes in the evening or weekends) which restricted me to engage in routine activities." (IDI-1,8)

They experienced more satisfaction with online classes than on-campus classes because of their physical convenience and being within their comfort zones. Such views are expressed in the following statement:

"Virtual classes had favorably induced me in terms of saving time and effort, by reducing the campus-based disturbances like compulsive participation in conversations, adjustment with inevitable sound and waste of time in finding a proper place to study alone." (IDI-3)

Theme 3: Digital Divide Issues

Connectivity and Signals Issues

Slow or limited internet connectivity significantly impacts students' academic ability in an online learning setting. The digital divide is also a common phenomenon in Pakistan due to its poverty and limited resources for digital devices. Respondents shared several connectivity issues that students who belong to urban and rural areas encounter while online learning. Some respondents explained that the internet sometimes drops out during online synchronous classes, causing them to miss important information.

"Slow internet connectivity and communication software failure were among frequent technical issues which I faced during the whole course." (IDI-1)

"I used to face widespread internet disconnection during online lectures daily, and it was tough for me to follow lectures with instructors."(IDI-3)

The quality of the internet and data coverage can vary throughout a household. Home networks get overloaded at a slow internet speed with multiple people and devices connected to the internet simultaneously. One respondent shared her experience towards connectivity issue:

"I am living in a joint family, and most members of my family use internet connection at the same timing for their e-learning and official use. It turns internet overloaded, and my internet does not support zoom application." (IDI-4)

When students use Zoom for video lectures, the poor quality of internet connections distorts the video and audio attributes. Low socio-economic status brings this issue to the most due to the low quality of internet and less affordability for those devices that support the Zoom application.

"Whenever the signals drop, the video gets blurred, or the audio gets distorted; all the video and audio are not in sync anymore." (IDI-5)

"The mobile data is costly for me because I have attended lectures and delivered lectures. So, I must face issues while connecting to the zoom meeting, but other family members have no issue on the internet, so they suggested that the problem is in the app, which is keeping the link down." (IDI-6)

Electricity Issues

Another hindrance that respondents of the current study stated was load shedding during online classes. The concept of virtual learning cannot apply without the internet and WiFi signals; in developing countries, urban and rural areas face electricity shortfall, similarly, in the excess of voltage. Most rural areas have more electricity issues than urban areas; however, high socio-economic status families arrange other sources to supply power to these devices, such as generators, UPS, and solar systems in their homes. Few respondents expressed similar concerns:

"Mostly in my area electricity is off most of the time and mobile data is too costly for me so ultimately I face the connectivity issues during my virtual learning." (IDI-4)

"I have to take continuous virtual classes as per university schedule, and I need to charge my mobile battery very often, but sometimes it could not be charged due to load shedding of electricity." (IDI-1)

"I have no electricity issues due to solar system installation in my house, but my peer group always complains about their electricity load shedding." (IDI-6)

Financial Affordability Issues

Some study participants raised financial affordability issues such as the inability to buy effective devices for e-learning (High feature mobiles and laptops) and the difficulty to pay for internet services. Moreover, some posts showed that the internet is not free for all, and data usage is limited in Pakistan. In other words, students must pay for internet or mobile data packages, and more time on the internet for studying means more cost for them. Moreover, if digital devices cannot support zoom applications, students cannot attend synchronous e-learning.

"Unfortunately, cell I have run in an older version of Android (software), which Zoom does not support. My financial condition does not allow me to spend more money on a new cell phone that fulfills the requirements needed to run that application." (IDI-7)

"I was awarded a laptop through the CM scheme in 2018. That laptop has a mobile processor and a faulted product with a malfunctioning keyboard and no personal mobile. However, I do not have the monetary sums to buy a new one." (IDI-8)

Conclusion

This study shows a detailed understanding of students' experiences towards an abruptly adopted virtual learning mode during lockdown due to COVID-19 Pandemic. Pakistani Students face different issues during online classes because of unpreparedness and invalid infrastructure that supports virtual learning. Moreover, findings suggest that rich media to deliver course content can reduce ambiguity and help to simplify the information due to its feedback attributes. The results only repeat something already painfully obvious: socioeconomic status undoubtedly influences learning, positively or negatively, be it in person or even online. The study rules out that pre-existing digital divide significantly affects the successful online process and the several factors that are significant barriers for effective e-learning. Such as connectivity and signal issues, electricity issues, affordability of

digital devices, invalid instructional course design. Additionally, the current disruptive situation calls for a new valid infrastructure for virtual learning that fosters effective digital devices utilization.

References

- Abbasi S, Ayoob T, Malik A, Memon SI. Perception of students regarding E-learning during COVID-19 at a private medical college. *Pakistan Journal of Medical Sciences*.2020 May 9; 36 (COVID19-54).
- Al-Balas, M., Al-Balas, H. I., Jaber, H. M., Obeidat, K., Al-Balas, H., Aborajoo, E. A. ... & Al-Balas, B. (2020). Distance learning in clinical medical education amid COVID-19 Pandemic in Jordan: current situation, challenges, and perspectives. *BMC medical education*, 20(1), 1-7.
- Bourouiba, L. (2020) Turbulent gas clouds and respiratory pathogen emissions: Potential implications for reducing transmission of COVID-19. *JAMA*. doi:10.1001/jama.2020.4756.
- Chang, Y. S., & Yu, K. C. (2015). The relationship between perceptions of an innovative environment and creative performance in an online synchronous environment. *Computers in Human Behavior*, 49, 38-43.
- Charmaz, K. (2008). Reconstructing grounded theory. *The Sage handbook of social research methods*, 461-478.
- Chen, X., Siau, K., & Nah, F. F. H. (2011). Web-Conferencing Based Education: An Empirical Comparison with Face-to-Face Education. In *AMCIS*.
- Chinien, C., & Boutin, F. (2003, July). Bridging the cognitive divide in ICT-mediated learning. In *Proceedings 3rd IEEE International Conference on Advanced Technologies* (pp. 422-423). IEEE.
- Cloete, E. (2001). Electronic education system model. *Computers & education*, 36(2), 171-182.
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative sociology*, 13(1), 3-21.
- D'Souza, M. J., Fry, K., Koyanagi, L., & Shepherd, A. (2020). COVID-19 Impacts at a Small Mid-Atlantic Liberal-Arts College with Implications for STEM Education. *Journal of education and e-learning research*, 7(4), 40.
- Farid, S., Ahmad, R., Niaz, I. A., Arif, M., Shamshirband, S., & Khattak, M. D. (2015). Identification and prioritization of critical issues for the promotion of e-learning in Pakistan. *Computers in Human Behavior*, 51, 161-171.
- Fujita, N. (2020). Transforming online teaching and learning: towards learning design informed by information science and learning sciences. *Information and Learning Sciences*.
- Fulton, C. (2020). Collaborating in online teaching: Inviting e-guests to facilitate learning in the digital environment. *Information and Learning Sciences*.
- Gay, G. H. (2020). Together Apart during the COVID-19 Pandemic: Assessing Students' Readiness for Online Assessments Using an E-Learning System. In *E-Learning and Digital Education in the Twenty-First Century-Challenges and Prospects*. IntechOpen.

- Hargitta E and Hinnant A (2008) Digital inequality: differences in young adults' use of the internet. *Communication Research* 35(5); 602-621.
- Hasan, N., & Bao, Y. (2020). Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 Pandemic: A mediating role of "fear of academic year loss". *Children and Youth Services Review*, 118, 105355.
- Hernández, S. S. F., & Flórez, A. N. S. (2020). Online Teaching During Covid-19: How to Maintain Students Motivated in an EFL Class. *Linguistics and Literature Review*, 6(2), 157-171.
- Hogenbirk, J. C., Timony, P. E., French, M. G., Strasser, R., Pong, R. W., Cervin, C., & Graves, L. (2016). Milestones on the social accountability journey: family medicine practice locations of Northern Ontario School of Medicine graduates. *Canadian Family Physician*, 62(3), e138-e145
- Hrastinski, S. (2008). Asynchronous and synchronous e-learning. *Educause quarterly*, 31(4), 51-55.
- Hsieh, Y. H., & Tsai, C. C. (2012). The effect of moderator's facilitative strategies on online synchronous discussions. *Computers in Human Behavior*, 28(5), 1708-1716.
- Kiernan, J. E. (2020). Pedagogical commentary: Teaching through a pandemic. *Social Sciences & Humanities Open*, 2(1), 100071.
- Kuika Watat, J., & Jonathan, G. M. (2020). Breaking the digital divide in rural Africa.
- Lange, C., & Costley, J. (2019). The negative impact of media diversity on self-regulated learning strategies and cognitive load. *Issues in Educational Research*, 29(1), 158-179.
- Lengel, R. H., & Daft, R. L. (1984). An exploratory analysis of the relationship between media richness and managerial information processing. Texas A And M University College Station Department of Management.
- Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New media & society*, 9(4), 671-696.
- Maphosa, V., Jita, T., & Dube, B. (2020, June). Students' perception and use of Moodle as the E-Learning system implemented at a rural University in Zimbabwe. In *EdMedia+ Innovate Learning* (pp. 175-182). Association for the Advancement of Computing in Education (AACE).
- Mason, M. (2010, August). Sample size and saturation in PhD studies using qualitative interviews. In *Forum qualitative Sozialforschung/Forum: qualitative social research* (Vol. 11, No. 3).
- Mertens, D. M. (2010). Philosophy in mixed methods teaching: The transformative paradigm as illustration. *International Journal of Multiple Research Approaches*, 4(1), 9-18.
- Ministry of Health [Republic of Turkey Ministry of Health] (2020). COVID-19 (SARS-CoV-2 Infection) Guide. Retrieved from https://covid19bilgi.saglik.gov.tr/depo/rehberler/COVID-19_Rehberi.pdf
- Morganti, L., Helberger, N., Mariën, I., & Prodnik, J. A. (2014). Digital inclusion and user (dis) empowerment: A critical perspective. *info*.

- Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing research*, 40(2), 120-123.
- Mutambik, I., Lee, J., & Almuqrin, A. (2020). Role of gender and social context in readiness for e-learning in Saudi high schools. *Distance Education*, 41(4), 515-539.
- Nikmah, K., & Azimah, N. (2020). A Study of Synchronous and Asynchronous Approaches: Online Arabic Learning During the Covid-19 Pandemic. *Alsuna: Journal of Arabic and English Language*, 3(2), 115-139.
- Patton, M. Q. (1987). *How to use qualitative methods in evaluation* (No. 4). Sage.
- Pearson, M. (2020). A meta-analysis of COVID-19: Challenging Australia's Vocational Education sector. *Journal of Vocational Education Studies*, 3(2), 53-60.
- Prasad, N., Fernando, S., Willey, S., Davey, K., Kent, F., Malhotra, A., & Kumar, A. (2020). Online interprofessional simulation for undergraduate health professional students during the COVID-19 Pandemic. *Journal of interprofessional care*, 34(5), 706-710.
- Reddick, C. G., Enriquez, R., Harris, R. J., & Sharma, B. (2020). Determinants of broadband access and affordability: An analysis of a community survey on the digital divide. *Cities*, 106, 102904.
- Rinekso, A. B., & Muslim, A. B. (2020). Synchronous online discussion: Teaching English in higher education amidst the covid-19 Pandemic. *JEES (Journal of English Educators Society)*, 5(2), 155-162.
- Sahu, P. (2020). Closure of universities due to Coronavirus Disease 2019 (COVID-19): impact on education and mental health of students and academic staff. *Cureus*, 12(4).
- Simamora, R. H. (2020). Learning of Patient Identification in Patient Safety Programs Through Clinical Preceptor Models. *Medico Legal Update*, 20(3), 553-556.
- Song, Z., Song, T., Yang, Y., & Wang, Z. (2019). Spatial–Temporal Characteristics and Determinants of Digital Divide in China: A Multivariate Spatial Analysis. *Sustainability*, 11(17), 4529.
- Strauss, A., & Corbin, J. (1990). *Qualitative research*.
- Subedi, S., Nayaju, S., Subedi, S., Shah, S. K., & Shah, J. M. (2020). Impact of E-learning during COVID-19 Pandemic among nursing students and teachers of Nepal. *International Journal of Science and Healthcare Research*, 5(3), 68-76.
- Sun, P. C., & Cheng, H. K. (2007). The design of instructional multimedia in e-Learning: A Media Richness Theory-based approach. *Computers & education*, 49(3), 662-676.
- Telli Yamamoto, G., & Altın, D. (2020). The coronavirus and rising of online education. *Journal of University Research*, 3(1), 25-34.
- Tichenor, P. J., Donohue, G. A., & Olien, C. N. (1970). Mass media flow and differential growth in knowledge. *Public opinion quarterly*, 34(2), 159-170.
- Warschauer, M. (2002). Reconceptualizing the digital divide. *First Monday*.

- Wei, L., & Hindman, D. B. (2011). Does the digital divide matter more? Comparing the effects of new media and old media use on the education-based knowledge gap. *Mass Communication and Society*, 14(2), 216-235.
- Winarto, W., Syahid, A., & Saguni, F. (2020). Effectiveness the Use of Audio-Visual Media in Teaching Islamic Religious Education. *International Journal of Contemporary Islamic Education*, 2(1), 81-107.
- Yang, Y., & Cornelius, L. F. (2004). Students' perceptions towards the quality of online education: A qualitative approach. Association for Educational Communications and Technology.
- Yulia, H. (2020). Online learning to prevent the spread of pandemic corona virus in Indonesia. *ETERNAL (English Teaching Journal)*, 11(1).