

Online Learning Challenges in the Time of COVID-19: A Survey Among the Undergraduate Students of the Mindanao State University-Main Campus, Marawi City

Marecon Comita Viray¹, Ashley Ali Bangcola²

¹Department of Public Administration, Mindanao State University, Marawi City, Philippines

²College of Health and Sciences, Mindanao State University, Marawi City, Philippines

Email address:

marecon.viray@msumain.edu.ph (Marecon Comita Viray), ashley.bangcola@msumain.edu.ph (Ashley Ali Bangcola)

To cite this article:

Marecon Comita Viray, Ashley Ali Bangcola. Online Learning Challenges in the Time of COVID-19: A Survey Among the Undergraduate Students of the Mindanao State University-Main Campus, Marawi City. *Research & Development*. Vol. 3, No. 4, 2022, pp. 192-204.

doi: 10.11648/j.rd.20220304.11

Received: April 18, 2022; **Accepted:** August 24, 2022; **Published:** October 11, 2022

Abstract: The education system has recently been rocked by an extraordinary health crisis, the COVID-19 epidemic, which has shattered its foundation. As a result, governments all around the world have initiated a crisis response to offset the pandemic's negative impact on education. Curriculum adjustments, supply of technical resources and infrastructure, shifts in the academic calendar, and rules on instructional delivery and assessment are all examples of this approach. These advancements pushed educational institutions to go to complete online learning until face-to-face instruction was permitted. However, only a small percentage of public schools in the Philippines have internet connectivity. According to Aida Yuvienco, Director of the DepEd's ICT Service, "Only 26% of public schools are linked to the internet or are capable of connecting to the internet," adding that approximately 5,000 public schools in isolated locations lack access to energy. The acceptance of online learning across many learning contexts, whether formal or informal, academic or non-academic, domestic or remote, is one such development. We started to see schools, instructors, and students adopting e-learning tools that allow teachers to conduct interactive instruction, effortlessly exchange resources, and enhance student collaboration and involvement. Finally, this research proposed several potential solutions for improving the online learning environment. Addressing these issues would shed light on the wide range of challenges that undergraduate students at Mindanao State University's Main Campus in the Bangsamoro Autonomous Region of Muslim Mindanao face in a fully online learning environment, especially in light of the epidemic. Meanwhile, school administrators and teachers will gain from a deeper understanding of the strategies students use to overcome obstacles, allowing them to better satisfy students' online learning needs. Furthermore, the findings could be used to figure out how different types of approaches work in an online learning environment.

Keywords: Online Learning, COVID-19 Epidemic, Education

1. Introduction

As a result of the ever-expanding influence of technology, the world has experienced enormous changes in the landscape of education since the 1990s. The acceptance of online learning across many learning contexts, whether formal or informal, academic or non-academic, domestic or remote, is one such development. We started to see schools, instructors, and students adopting e-learning tools that allow teachers to conduct interactive instruction, effortlessly exchange resources, and enhance student collaboration and involvement [15, 18]. Despite the fact that the educational

world has long recognized the efficacy of online learning [5, 6, 10, 24, 35], evidence on the hurdles in its implementation continues to accumulate e.g. [7, 27].

The education system has recently been rocked by an extraordinary health crisis, the COVID-19 epidemic, which has shattered its foundation. As a result, governments all around the world have initiated a crisis response to offset the pandemic's negative impact on education. Curriculum adjustments, supply of technical resources and infrastructure, shifts in the academic calendar, and rules on instructional delivery and assessment are all examples of this approach. These advancements pushed educational institutions to go to

complete online learning until face- to-face instruction was permitted. However, only a small percentage of public schools in the Philippines have internet connectivity. According to Aida Yuvienco, Director of the DepEd's ICT Service, "Only 26% of public schools are linked to the internet or are capable of connecting to the internet," adding that approximately 5,000 public schools in isolated locations lack access to energy.

The current situation is unusual in that it has the potential to exacerbate the difficulties encountered during online learning because of movement limits and health measures [19, 23]. Given the current situation, it is critical to acquire a more detailed knowledge of students' online learning experiences during the COVID-19 pandemic. To date, many studies have focused on students' mental health [11, 16], home learning [34], self-regulation [9], virtual learning environments [2, 20, 36], and overall learning experience [2, 1, 12, 25, 31].

Finally, this research proposed several potential solutions for improving the online learning environment. Addressing these issues would shed light on the wide range of challenges that undergraduate students at Mindanao State University's Main Campus in the Bangsamoro Autonomous Region of Muslim Mindanao face in a fully online learning environment, especially in light of the epidemic. Meanwhile, school administrators and teachers will gain from a deeper understanding of the strategies students use to overcome obstacles, allowing them to better satisfy students' online learning needs. Furthermore, the findings could be used to figure out how different types of approaches work in an online learning environment.

1.1. Literature Review

An outbreak of a novel coronavirus known as COVID-19 reported in China in December 2019 and quickly spread around the globe within a few months. COVID-19 is an infectious disease produced by a new coronavirus strain that targets the lungs [39]. COVID-19 had infected 94 million individuals and killed 2 million people in 191 countries and territories as of January 2021 [22]. This pandemic has wreaked havoc on educational systems worldwide, affecting nearly 1.5 billion students. It has compelled the government to postpone national exams and schools to close temporarily, end face-to-face instruction, and rigidly enforce physical separation. These events have fueled higher education's digital transition and tested its ability to adapt quickly and effectively. Schools adapted relevant technologies, developed learner and staff resources, established systems and infrastructure, implemented new teaching protocols, and revised curricula. However, for some schools, the transfer was straightforward, while for others, particularly those from developing nations with insufficient infrastructure, it was difficult [26, 30].

As the world continues to battle the virus's violent spread, schools and other learning spaces have been forced to transition to complete online learning. A learning environment that leverages the Internet and other technical devices and resources for synchronous and asynchronous instructional delivery and management of academic programs is referred to as online learning [37, 21]. Asynchronous online learning

occurs without a set schedule for individual students, whereas synchronous online learning incorporates real-time interactions between the teacher and the students [32]. Within the context of the COVID-19 pandemic, online learning has taken the status of interim remote teaching that serves as a response to an exigency. However, policy, pedagogy, logistics, socioeconomic considerations, technology, and psychosocial aspects have all played a role in the migration to a new learning space [13, 25, 38]. Government education organizations and schools hurried to produce foolproof policies on governance structure, teacher management, and student management when it came to policies. Academically, while students can essentially study anything online, learning may be less than optimal, particularly in classes that require face-to-face contact and direct interactions [17].

There has been a recent surge of research into the new normal in education. While some concentrated on national policies, professional development, and curriculum, others focused on students' individual learning experiences during the pandemic. The impact of COVID-19 on college students' mental health and coping mechanisms was studied [11]. Isolation, economic/health impacts, and uncertainty all impacted students' behavioral and emotional functioning, notably attention and externalizing difficulties (i.e., mood and wellness behavior). Students expressed worries about learning and evaluation techniques, an overwhelming task load, technical challenges, and confinement. Students actively coped with these issues by seeking aid from their professors and families, as well as participating in leisure activities [16]. These students' active-oriented coping techniques matched those who looked into students' self-regulation tactics [9].

Investigated the efficacy of several online teaching formats among engineering students in another study. Students were disappointed with online learning in general, particularly in terms of communication and question-and-answer techniques, according to the results of a survey. Despite this, students' attention, academic performance, and course evaluation increased when online instruction and flipped classrooms were combined. The parallel study in which they used a cloud-based video conferencing program to transform traditional flipped classrooms into completely online flipped classrooms [20]. They also discussed how to implement videoconferencing-assisted online flipped classes efficiently [34]. Unlike the other two research, looked examined how children learned at home throughout the pandemic. Their findings revealed that students in a home learning environment encountered numerous challenges, including a lack of technological proficiency, expensive Internet costs, and restricted interaction/socialization amongst and among students [23]. They studied how lockdown affects pupils' learning performance in a related study. Anxiety, sadness, inadequate Internet connectivity, and hostile home learning environment are all factors that are exacerbated when students are marginalized and from outlying places [19]. According to Gonzales found that confinement of students during the pandemic had significant positive effects on their performance, contrary findings [23]. These findings were linked to students' continued use of learning strategies,

which enhanced their learning efficiency.

Finally, there were those who concentrated on the total online learning experience of students during the COVID-19 pandemic, for example, used a quantitative descriptive technique to investigate students' experiences during the COVID-19 epidemic. Students welcomed the usage of online learning during the epidemic, according to their findings. In terms of methodology, the researchers concede that the quantitative character of their study prevents a more in-depth analysis of the results. Unlike the previous study, conducted a qualitative investigation of the efficacy of synchronized online learning in a Saudi Arabian medical school. Students usually think of synchronous online learning favorably, especially in terms of time management and efficacy, according to the findings [25]. They did, however, mention technical (internet connectivity and tool utility), methodological (content delivery), and behavioral (personality) difficulties. In a separate study, used a narrative inquiry approach to analyze students' online learning experiences throughout the epidemic [1]. The findings revealed that Ghanaian students saw online learning as inefficient due to a number of difficulties they faced. Among these were lack of social interaction among students, poor communication, lack of ICT resources, and poor learning outcomes. For example, looked at the immediate impact of COVID-19 on students' learning experiences. Six institutions in three countries provided evidence of both excellent experiences and pre-existing disparities. Lack of proper technologies, a bad learning environment at home, student stress, and a lack of fieldwork and laboratory access are among the issues raised [12].

1.2. Conceptual Framework

This study relies heavily on Rasheed RA et al.'s [27] analysis of students' experiences in an online learning environment for the typology of problems examined. Self-regulation (SRC), technology literacy and competency (TLCC), student isolation (SIC), technological sufficiency (TSC), and technical complexity (TCC) problems are among the five main categories [27]. SRC is a collection of behaviors that students use to manage their emotions, actions, and ideas in order to attain learning objectives. There are a number of issues that students face when it comes to using technology for educational purposes. SIC is a term used to describe the distress that students feel when they are isolated from their fellow students. A set of difficulties that students have when using readily available online technology for educational purposes is known as TSC. Last but not least, there is TCC, which deals with the difficulties that students run across when confronted with overly sophisticated and overabundant technologies for online education.

Additional clusters were added to Rashid categories, including learning resource difficulties (LRC) and learning environment challenges (LEC), to cover additional challenges during online classes [8, 28, 29, 40]. When it comes to library resources and instructional materials, the LRC refers to a group of obstacles that students face, whereas the LEC refers to a set of challenges that students face when it comes to their

learning environment. There has been research indicating that students' learning environments and the resources they have at their disposal have a significant impact on the quality of their learning and their achievement of learning outcomes [14, 34], so including LRC and LEC would allow us to capture additional important challenges that students face during the pandemic, particularly those from developing regions. Using this thorough list, we can have a better understanding of students' online learning experiences in the event of an emergency. In addition, the pandemic's macro and micro-level mobility restrictions are predicted to exacerbate these issues. This paper, therefore, aims to comprehend these difficulties from the perspective of students, as they are the ones who are ultimately affected when the issue is about the learning process. Furthermore, we were interested in looking at areas where current research has come up short, in order to help pave the way for future investigations.

1.3. Statement of the Problem

Although there are a few studies that document the online learning challenges that higher education students face during the pandemic, there is little information about the teaching strategies they consider to be beneficial in this online learning environment, as well as possible solutions for improving the online learning environment. This quantitative descriptive study looks into students' online learning experiences in higher education.

The following research questions are covered in detail: (1) What are the problems and barriers to online learning that have arisen as a result of the COVID-19 pandemic? (2) Which teaching strategies worked well with the students and which did not? (3) What are some possible interventions that students have suggested for improving the online learning environment?

2. Material and Methods

The present study addressed the research questions through a quantitative, descriptive approach. This strategy enabled the researchers to collect detailed data about students' experiences in an online learning environment and to gain a good understanding of the phenomena from the students' perspective.

2.1. Participants

Among the 267 students surveyed from Mindanao State University in the Philippines, two students were removed from the analysis as they never had an online class during the semester covered in this study. As a result only those responses from the 265 students were included in the analysis (34 males and 231 females). These participants were from the College of Health Sciences (81.5%), College of Business Administration and Accountancy (4.2%), College of Engineering (3.4%), College of Agriculture (1.5%), College of Education (1.1%), College of Engineering (3.4%), College of Fisheries (0.4%), College of Forestry and Environmental Studies (0.8%),

College of Hotel and Restaurant Management (0.8%), College of King Faisal Center for Islamic, Arabic and Asian Studies (1.5%), College of Natural Science and Mathematics (1.5%), College of Public Affairs (1.9%), and College of Social Sciences and Humanities (1.5%). The students belonged to the age groups 18-21 years old (77%), 22-25 years old (21.9%), and 26-29 years old (1.1%).

2.2. Instrument and Data Collection

Data was gathered using a retrospective self-report questionnaire. A self-report questionnaire was chosen because the variables include affective reactions and attitude [3, 4, 33]. The questionnaire was divided into six sections: (1) personal information about the participants; (2) background information on the accessibility of the online learning environment; (3) a rating scale for the students' general impressions of online learning; (4) a rating scale for the problems and barriers encountered in online learning during the second semester of Academic Year 2020-2021; (5) a rating scale for the perceived usefulness of teaching strategies that were implemented during the second semester of Academic Year 2020- 2021; and (6) a rating scale section regarding the perceived importance of possible interventions for improving the online learning environment.

The students' personal information part asked for information such as age, and sex, college, year level, monthly family income, whether the student's family is a 4P's beneficiary, and whether the student is a scholarship grantee.

The rating scale portion included 68 entries pertaining to students' overall impressions of online learning (7 items); problems and barriers encountered during the second semester of Academic Year 2020-2021 in online learning, which were classified into five categories: technological problems/barriers (6 items), individual problems/barriers (8 items), domestic problems/barriers (5 items), institutional problems/barriers (11 items), and community problems/barriers (5 items). Meanwhile, the rating scale portion of the questionnaire focused on the perceived usefulness of teaching strategies encountered by students during their online learning experience included 11 items (individual projects, group projects, collaborative learning/small group discussion, synchronous lectures (video mode), synchronous lectures (chat mode), recorded lectures, assignments, case studies, symposiums/seminars, reporting, and oral recitation). Finally, the rating scale section regarding the perceived value of possible interventions for improving the online learning environment included 15 items and one open-ended question.

The questionnaire was evaluated for clarity, accuracy, content validity, and face validity. Google Surveys was used to create the questionnaire. Only 265 completed questionnaires were found to be appropriate for analysis out of 267 students that responded to the survey.

2.3. Ethical Consideration

While it is traditional to seek written consent contends that overly formal techniques of gaining consent should be

eschewed in favor of creating relationships marked by ongoing ethical care for participants. When the completed questionnaire was submitted by email, it was deemed sufficient consent in this study. For the duration of the study, the following ethical guidelines were implemented: a) the dignity and well-being of students were protected at all times; b) offensive, discriminatory, or other unacceptable language was carefully avoided in the questionnaire formulation; c) the works of other authors used in any part of this study were acknowledged using the APA referencing system; and d) the highest possible level of objectivity was maintained in the discussions and analyses throughout the research.

2.4. Analyses of Data

Quantitative analysis was used to address the research questions. The data were entered into an excel file for the quantitative analysis. The mean scores and standard deviations were then calculated to ascertain the students' general impressions of online learning; problems and barriers encountered in online learning; perceived usefulness of teaching strategies that were implemented during second semester of Academic Year 2020-2021; and the perceived importance of possible interventions for improving the online learning environment.

3. Results

The goal of this study was to assess students' experiences with online learning in higher education in the context of the pandemic. Specifically, this study described the participants' personal characteristics, as well as background information on the online learning environment's accessibility. Additionally, this study identified problems and barriers to online learning that have evolved as a result of the COVID-19 pandemic, effective teaching approaches for students, and some potential solutions for improving the online learning environment.

3.1. Part I: Personal Profile About the Respondents

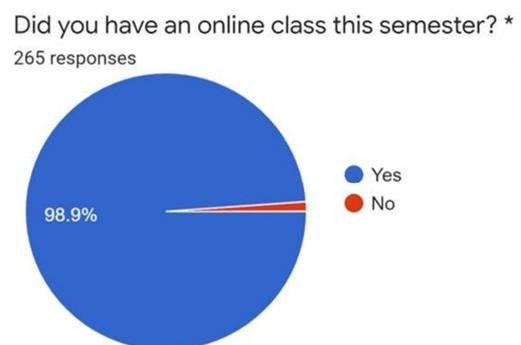


Figure 1. Percentage Distribution of the Respondents in terms of Having an Online Class.

The figure above depicts the respondents' percentage distribution in terms of taking an online class. According to the results, 98.9 percent of respondents have taken online classes during the second semester of Academic Year 20202021.

The graph depicts the respondents' percentage distribution in terms of the mode of instruction used in their classes during the second semester of Academic Year 2020-2021. According to the data, 92.1 percent of students are using both synchronous and asynchronous modes of learning during that semester. However, 5.3 percent are engaged in asynchronous activities alone and 2.6 percent in synchronous activities alone.

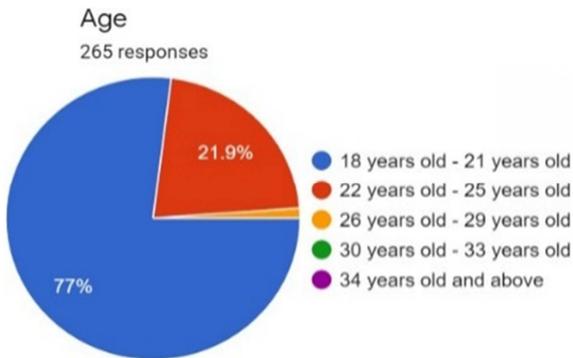


Figure 2. Percentage Distribution of the Respondents by Age.

The depicts the respondents' age distribution as a percentage. According to the data, the bulk of responders (77 percent) are between the ages of 18 and 21. This is followed by those aged 22-25, who account for 21.9 percent.

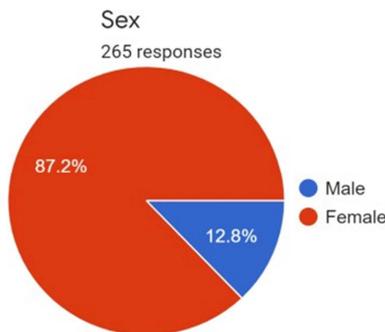


Figure 3. Percentage Distribution of the Respondents by Sex.

The chart above depicts the respondents' percentage distribution by sex. Male respondents account for 12.8 percent of respondents, while female respondents account for 87.2 percent. Male responders outnumber female responders by a wide margin.

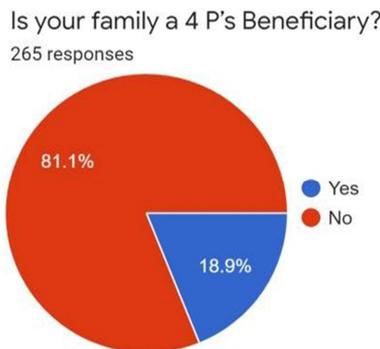


Figure 4. Percentage Distribution of the Respondents in terms of whether their Family is a 4P's Beneficiary.

The figure above illustrates the respondents' percentage distribution in terms of whether their family is a 4P's beneficiary or not. According to the results, the majority of respondents (81.1 percent) are 4P's beneficiaries. This confirms the result of the percentage distribution, which indicates that the majority of respondents have a family income of 10,000 pesos or less.

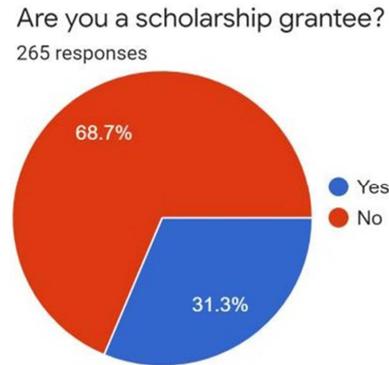


Figure 5. Percentage Distribution of the Respondents in terms of whether they are Scholarship Grantees.

The chart above shows the percentage distribution of the respondents in terms of whether they are scholarship grantees or not, regardless of the kind of scholarship they are enjoying. According to the result presented above, the majority of the respondents are scholars which is 68.7%.

3.2. Part II: Background Information on the Online Learning Environment's Accessibility

The data relating to respondents' access to the internet are summarized in Table 1. According to the aggregated data, respondents 'often' agreed that they could access the internet at home any time, with the highest mean at 3.67 (SD=1.03). Meanwhile this is followed by statement 2, where respondents 'sometimes' could access their internet at home, but only during specific times, with mean 3.15 (SD=1.35). For statement 3, respondents 'seldom' had to visit their neighbor for access to the internet with mean 2.32 (SD=1.32). Respondents also seldom to travel to other barangays or municipalities just to get access to the internet, with mean 1.87 (SD=1.16). Finally, respondents almost always 'never' access their internet through their institution's facilities with mean 1.58 (SD=1.04), possibly because such facilities are not existing in the first place.

Table 2 presents a summary of the information collected on the devices that respondents use to access the internet. A mean of 4.54 (standard deviation: 0.79) was recorded among respondents who 'always' used their smartphone or iPhone, according to the aggregated data.

They 'often' use their laptop, with a mean of 4.0 (standard deviation=1.11), and they 'never' use their desktop computer (M=1.64, standard deviation=1.14), tablet or iPad (M=1.32, standard deviation=0.81).

Table 1. Location When Connecting to the Internet.

Items	Mean	SD	Interpretation
1. At home any time I can access the internet.	3.67	1.03	Often
2. At home, there is a specific time in accessing the internet.	3.15	1.35	Sometimes
3. I have to visit my neighbor for me to access the internet.	2.32	1.32	Seldom
4. I secure my internet connection through going to our local public spaces (Plaza, Market, etc.)	2.09	1.19	Seldom
5. I needed to travel to another barangay/municipality to access internet	1.87	1.16	Seldom
6. I secure my internet connection through availing the facilities available in the university (College/Department Wi-Fi, University Library Wi-Fi, etc.)	1.58	1.04	Never
Total Average Mean	2.44	1.18	Seldom

Scaling: 1-1.8=Never; 1.81-2.60 =Seldom; 2.61-3.40=Sometimes; 3.41-4.20=Often; 4.21-5.0=Always.

Table 2. Devices Used in Online Learning.

Items	Mean	SD	Interpretation
7. Smartphone/iPhone	4.54	0.79	Always
8. Desktop Computer	1.64	1.14	Never
9. Tablet/iPad	1.32	0.81	Never
10. Laptop	4.00	1.11	Often
Total Average Mean	2.88	0.96	Sometimes

Scaling: 1-1.8=Never; 1.81-2.60 =Seldom; 2.61-3.40=Sometimes; 3.41-4.20=Often; 4.21-5.0=Always.

Table 3. Means of Connection.

Items	Mean	SD	Interpretation
11. Mobile Data	3.90	1.14	Often
12. Own Broadband Internet (DSL, Wi-Fi, Satellite, etc.)	3.43	1.63	Often
13. Neighbor/Relatives /Barangay/Municipal Hall/Library	1.72	1.02	Never
14. Computer Shops	1.22	0.59	Never
Total Average Mean	2.57	1.09	Seldom

Scaling: 1-1.8=Never; 1.81-2.60 =Seldom; 2.61-3.40=Sometimes; 3.41-4.20=Often; 4.21-5.0=Always.

The data relating to which devices respondents’ means of connection to the internet are summarized in Table 3. According to the aggregated data, respondents ‘often’ use their mobile data (M=3.90, SD=1.14) or broadband internet

(M=3.43, SD=1.63). Meanwhile, they ‘never’ use other sources such as that from neighbors or in other places such as the library (M=1.72, SD=1.02) or computer shops (M=1.22, SD=0.59).

Table 4. Experiences with Power Interruption, Calamities and Natural Disasters.

Items	Mean	SD	Interpretation
15. How often do you experience power interruption?	3.33	0.85	Sometimes
16. How often do you experience calamities and natural disasters?	2.83	0.89	Sometimes
Total Average Mean	3.08	0.87	Sometimes

Scaling: 1-1.8=Never; 1.81-2.60 =Seldom; 2.61-3.40=Sometimes; 3.41-4.20=Often; 4.21-5.0=Always.

Table 4 summarizes the information collected from respondents about their experiences with power outages, natural catastrophes, and other calamities and tragedies. Participants 'sometimes' encounter power disruptions (M=3.33, SD=0.85), as well as natural disasters and calamitous events (M=2.83, SD=0.89), according to the data collected in aggregate.

Figure 6 depicts the percentage of respondents who had a fast internet connection. The majority of responders (56.6 percent) reported having moderately fast internet access. 20 percent had moderately slow internet, followed by 12.6 percent who had moderately fast internet, and 7.5 percent who had slow internet, according to the survey results. Only a few, or fewer than five percent (3.1 percent), of the population have access to high-speed internet.

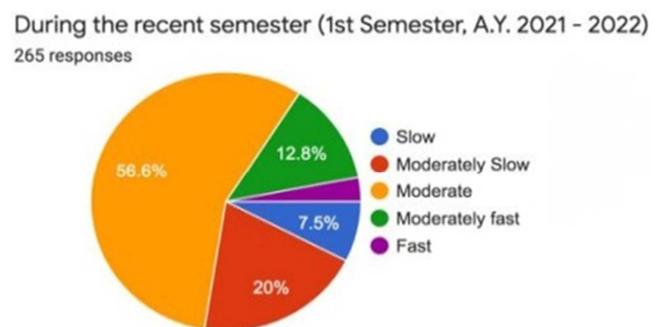


Figure 6. Percentage Distribution of the Respondents in terms of Internet Connection Speed Status.

3.3. Part III: General Impressions About Online Learning

Table 5. Respondents' General Impressions about Online Learning.

Items	Mean	SD	Interpretation
1. Despite the problem with online learning, I still gained knowledge on the courses I enrolled in.	3.48	0.74	Agree
2. I am able to cope better now with online learning compared to the previous semester.	3.05	1.02	Neutral
3. I encountered lesser problem this semester than the previous one.	2.77	1.09	Neutral
4. The teaching styles of my instructors are improving this semester.	3.40	0.89	Neutral
5. I did not regret enrolling this semester.	4.09	0.81	Agree
6. The communication between me and the instructor is better compared to face to face - class	2.21	1.00	Disagree
7. The amount of course work in online education program is way easy compared with face to face -class instruction.	2.23	0.99	Disagree
Total Average Mean	3.03	0.93	Neutral

Scaling: 1-1.8=Strongly Disagree; 1.81-2.60 = Disagree; 2.61-3.40=Neutral; 3.41-4.20=Agree; 4.21-5.0=Strongly Agree.

The table above summarizes respondents' impressions about online learning. The positively-coded statements had varying results. Respondents agreed with statements 1 "despite the problem with online learning, I still gained knowledge on the courses I enrolled in" (M=3.48, SD=0.74), and statement 5 "I did not regret enrolling this semester" (M=4.09, SD=0.81). In other words, respondents generally agreed that although learning has its problems, they still learned something, and they did not regret enrolling.

They were 'neutral' on statement 2 "I am able to cope better now with online learning compared to the previous semester" (M=3.05, SD=1.02), statement 3 "I encountered lesser problem this semester than the previous one" (M=2.77, SD=1.09), and statement 4 "the teaching styles of my instructors are improving this semester" (M=3.40, SD=0.89). However, they 'disagreed' with statement 6 "the communication between me and the instructor is better compared to face to face class" (M=2.21, SD=1.0) and statement 7 "the amount of course work in online education program is way easy compared with face to face class instruction" (M=2.23, SD=0.99). In other words, they did not

agree that communication with their instructions were easier in online classes, as compared to their face-to-face classes. Neither did they agree that the workload was easier compared to face-to-face classes.

3.4. Part IV: Problems and Barriers Faced in the Second Semester of Academic Year 2020-2021 in Online Learning in the Context of the COVID-19 Pandemic

Tables 6 to 10 summarizes the mean scores and standard deviations for the problems and barriers faced by the students in the second semester of Academic Year 2020-2021 in online learning in the context of the COVID-19 pandemic. This part of the survey has five sections: technological, individual, domestic, institutional, and community problems and barriers encountered.

The mean score for each descriptor was calculated as follows: 4.3 to 5.00 (Strongly Agree), 3.4 to 4.2 (Agree), 2.6 to 3.3 (Neutral), 1.8 to 2.5 (Disagree), 0.9 to 1.7 (Strongly Disagree), and 0 to 0.8 (Not Applicable). The equal interval scale was chosen because it generates more trustworthy and valid data than other scales (Cicchetti et al., 2006).

Table 6. Technological Problems/Barriers Encountered.

A. Technological Problems/Barriers Encountered	Mean	SD	Interpretation
1. I still don't have a stable internet connection in the place where I am residing now. I experience intermittent internet loss during class	3.40	1.26	Agree
2. Due to poor connection, the smooth flow of the teacher's discussion is interrupted so I cannot understand what the teacher discussed	3.76	1.03	Agree
3. The device I'm using for flexible learning class is already old and it lags always.	2.81	1.26	Neutral
4. I only borrow devices from other people when it is available.	1.99	1.13	Disagree
5. I have trouble adapting to unfamiliar technology.	2.47	1.12	Neutral
6. The online learning apps/learning materials require too much storage and my device's storage is very limited.	3.72	1.23	Agree
Total Average Mean	3.02	1.17	Neutral

Note: 4.3-5.00=Strongly Agree, 3.4-4.2=Agree, 2.6-3.3=Neutral, 1.8-2.5=Disagree, 0.9-1.7=Strongly Disagree, 0- 0.8=Not Applicable.

The technological problems/barriers that students have encountered in the second semester of Academic Year 2020-2021 while participating in online learning in the midst of the COVID-19 Pandemic are listed in the table above. According to the findings shown above, statement 2 "due to poor connection, the smooth flow of the teacher's discussion is interrupted so I cannot understand what the teacher discussed" has the highest mean of 3.76 (SD=1.03), indicating agreement. This is followed by statement 6 "the online

learning apps/learning materials require too much storage and my device's storage is very limited" with a mean of 3.72 (SD=1.23) and statement 1 "I still don't have a stable internet connection in the place where I am residing now. I experience intermittent internet loss during class" with a mean of 3.4 (SD=1.26), which is taken as agreeing. Statement 3 "the device I'm using for flexible learning class is already old and it lags always" and statement 5 "I have trouble adapting to unfamiliar technology" both had a mean of 2.8, which is

classified as neutral. Thus, based on the total average mean, students are neutral (M=3.02, SD=1.17) in their appraisal of

technological impediments or challenges faced throughout the second semester of Academic Year 2020-2021 online classes.

Table 7. Individual Problems/Barriers Encountered.

B. Individual Problems/Barriers Encountered	Mean	SD	Interpretation
1. I have a hard time understanding materials on my own.	3.71	0.87	Agree
2. I still lack the drive to study since it's different from the traditional school setup.	3.86	0.94	Agree
3. I often procrastinate due to some distractions like social media, have chit-chats with others.	3.80	1.11	Agree
4. This pandemic gives uncertainty, stress, and anxiety that leads to my lack of focus in studying	4.38	0.85	Strongly Agree
5. Coping up with the lesson is hard since access to my learning materials were left on my boarding house.	2.22	1.48	Disagree
6. I am embarrassed to participate in our online discussion in class.	3.15	1.17	Neutral
7. I don't feel good not being able to interact with friends and classmates face to face.	3.45	1.03	Agree
8. I often experience eye strain and headache from prolonged use of gadgets.	4.38	0.87	Strongly Agree
Total Average Mean	3.62	1.04	Agree

Note: 4.3-5.00=Strongly Agree, 3.4-4.2=Agree, 2.6-3.3=Neutral, 1.8-2.5=Disagree, 0.9-1.7=Strongly Disagree, 0- 0.8=Not Applicable.

Table 7 details the unique difficulties or impediments encountered by students during the second semester of Academic Year 2020-2021 while engaging in online learning in the middle of the COVID-19 Pandemic. According to the results above, students strongly concur with statements 4 and 8 "this pandemic gives uncertainty, stress, and anxiety that leads to my lack of focus in studying" (SD=0.85) and "I often experience eye strain and headache from prolonged use of gadgets" (SD=0.87), respectively. Both of these assertions received the highest mean score of 4.38.

While students agree with the statements "I still lack the drive to study since it's different from the traditional school setup" with a mean of 3.86 (SD=0.85); "I often procrastinate due to some distractions like social media, have chit-chats

with others" with a mean of 3.8 (SD=1.11), "I have a hard time understanding materials on my own" with a mean of 3.71 (SD=0.87), and "I don't feel good not being able to interact with friends and classmates face to face" with a mean of 3.45 (SD=1.03). Students, on the other hand disagree that "coping up with the lesson is hard since access to my learning materials were left on my boarding house" with a mean of 2.22 (SD=1.48). However, they were neutral with statement 6 "I am embarrassed to participate in our online discussion in class" with a mean of 3.15 (SD=1.17). Thus, based on the overall average mean of 3.62 (SD=1.04), students agree that they had unique difficulties throughout the semester's online study because of the COVID-19 Pandemic.

Table 8. Domestic Problems/Barriers Encountered.

C. Domestic Problems/Barriers Encountered	Mean	SD	Interpretation
1. It is hard to focus on my studies because of limited space (and/or noisy surroundings).	4.12	0.99	Agree
2. I need to do some work even during classes (ex: I need to prepare food, take care of people)	4.21	0.95	Agree
3. My family is struggling financially to spend for load or internet connection.	3.16	1.25	Neutral
4. I have to attend to other obligations to sustain my financial needs for online class.	2.49	1.33	Disagree
5. I cannot focus for online learning because it is affected by domestic issues such as strained relationships.	2.40	1.35	Disagree
Total Average Mean	3.28	1.17	Neutral

Note: 4.3-5.00=Strongly Agree, 3.4-4.2=Agree, 2.6-3.3=Neutral, 1.8-2.5=Disagree, 0.9-1.7=Strongly Disagree, 0- 0.8=Not Applicable.

The table above explains the domestic problems or barriers encountered by the students in their online learning amidst the COVID-19 pandemic during the semester covered in this study. According to the data presented in the table, student agree on statement 2 "I need to do some work even during classes (ex: I need to prepare food, take care of people)" with the highest mean of 4.21 (SD=0.95) followed by statement 1 "it is hard to focus on my studies because of limited space (and/or noisy surroundings)" with the mean of 4.12 (SD=0.99) which is also interpreted as agreeing. While students are neutral with statement 3 "my family is struggling

financially to spend for load or internet connection" which has mean of 3.16 (SD=1.25).

On the other side, students disagree that they must attend to others in order to meet their financial demands in class and that they are unable to focus on online learning due to strained relationships, with mean values of 2.49 (SD=1.03) and 2.40 (SD=1.35), respectively. Hence, based on the overall average mean of 3.28 (SD=1.17), students are ambivalent about their encounters with domestic issues throughout the semester's online study amidst the COVID-19 Pandemic.

Table 9. Institutional Problems/Barriers Encountered.

D. Institutional Problems/Barriers Encountered	Mean	SD	Interpretation
1. Class schedules were changed without consent or prior notice.	2.89	1.27	Neutral
2. Exams/quizzes are scheduled in conflict with other classes.	2.96	1.16	Neutral
3. Instructors do not give any feedback to students' work.	3.34	1.12	Neutral
4. Instructors only provide references/materials (presentation slides) without further discussion or presenter notes.	3.46	1.06	Agree

D. Institutional Problems/Barriers Encountered	Mean	SD	Interpretation
5. Lack of preparedness can be observed among instructors in shifting to online classes. (ex: Lack of technical skills)	3.02	1.02	Neutral
6. Instructors assign too many activities and give only short time to finish the said activities.	3.73	1.02	Agree
7. Instructors are too strict on the deadline on submission of the activities. No consideration given for late passers.	3.15	1.13	Neutral
8. Instructors lack leniency in checking attendance. (ex: less consideration for students with weak signal/short time allowance for logging in)	2.97	1.14	Neutral
9. Instructors respond late to questions asked during consultation hours.	3.00	1.08	Neutral
10. Instructors do not use activities that encourages active learning in combination with lecturing.	2.87	1.02	Neutral
11. Instructors do not provide step-by-step instructions and directions whenever they are needed.	3.02	1.03	Neutral
Total Average Mean	3.13	1.09	Neutral

Note: 4.3-5.00=Strongly Agree, 3.4-4.2=Agree, 2.6-3.3=Neutral, 1.8-2.5=Disagree, 0.9-1.7=Strongly Disagree, 0- 0.8=Not Applicable.

The table above summarizes the institutional difficulties or impediments that students encountered during the second semester of Academic Year 2020-2021 while engaging in online learning in the middle of the COVID-19 Pandemic. According to the data in the table, students concur that instructors assign an excessive number of exercises and provide insufficient time to complete them (M=3.73, SD=1.02) and that instructors supply simple references and

materials (presentation slides) without additional discussion or presenter notes (M=3.46, SD=1.06). While students are indifferent (neutral) to the remainder of the propositions with means ranging between 2.9 to 3.3.

Thus, based on the average mean of 3.13 (SD=1.09), students are receptive to the idea that they encountered institutional difficulties throughout this semester's online learning brought about by the COVID-19 pandemic.

Table 10. Community Problems/Barriers Encountered.

F. Community Problems/Barriers Encountered	Mean	SD	Interpretation
1. Curfew hours affect me because I usually have good connection at night only and I need go to other place to take my exams/quizzes for better connection.	2.55	1.53	Disagree
2. I failed to attend classes due to power interruptions that makes online learning difficult/ challenging.	3.89	1.11	Agree
3. I cannot focus because there are so many debates going on around the government and I am affected.	2.39	1.16	Disagree
4. I am distracted by the uncontrollable noise from neighbors and/or the noise of vehicles passing.	3.78	1.19	Agree
5. In times of natural disasters/calamities, my focus in online learning is affected.	3.99	0.92	Agree
Total Average Mean	3.32	1.18	Neutral

Note: 4.3-5.00=Strongly Agree, 3.4-4.2=Agree, 2.6-3.3=Neutral, 1.8-2.5=Disagree, 0.9-1.7=Strongly Disagree, 0- 0.8=Not Applicable.

The table above summarizes the community issues or impediments that students encountered during the second semester of Academic Year 2020-2021 while engaging in online learning in the midst of the COVID-19 pandemic. According to the statistics in the table above, students disagree with statement 1 "curfew hours affect me since I usually have a decent connection only at night and therefore need to go to another location to take my exams/quizzes" (M=2.55, SD=1.53) and statement 3 "I am unable to concentrate because there are so many debates swirling around the government, many of which influence me" which

has a mean of 2.39 (SD=1.16).

However, students concur with the statements "during natural disasters/calamities, my attention on online learning is impaired" (M=3.99, SD=0.92); "I missed classes due to power outages, which make online learning difficult/difficult" (M=3.89, SD=1.11); and "I am distracted by neighbors' unrestrained noise and/or the sounds of passing automobiles" (M=3.78, SD=1.19). Thus, based on the overall average mean of 3.32 (SD=1.18), students are ambivalent about their encounters with community issues throughout the semester's online learning amidst the COVID-19 pandemic.

3.5. Part V: Teaching Strategies

Table 11. Perceived Usefulness of Teaching Strategies Encountered by Students during their Online Learning Experience.

Items	Mean	SD	Interpretation
1. Individual Project	3.79	0.95	Helpful
2. Group Projects	3.32	1.12	Somewhat Helpful
3. Collaborative Learnings/Small Group Discussion	3.53	1.27	Helpful
4. Synchronous Lectures (Video Mode)	4.05	0.93	Helpful
5. Synchronous Lectures (Chat Mode)	3.16	1.34	Somewhat Helpful
6. Recorded Lectures	3.88	1.04	Helpful
7. Assignments	3.64	0.84	Helpful
8. Case study	3.26	1.30	Somewhat Helpful
9. Symposiums/Seminars	3.31	1.32	Somewhat Helpful
10. Reporting	3.55	1.05	Helpful
11. Oral Recitation	3.63	1.03	Helpful
Total Average Mean	3.56	1.10	Helpful

Note: 4.3-5.00=Very Helpful, 3.4-4.2=Helpful, 2.6-3.3=Somewhat Helpful, 1.8-2.5=Less Helpful, 0.9-1.7=Not Helpful, 0-0.8=Never Used.

The information in the table above highlights respondents' perceptions of the usefulness of specific teaching strategies when participating in online learning. Each of the following teaching strategies received a 'Helpful' rating: individual projects (M=3.79, SD=0.95), collaborative learning/small group discussions (M=3.53, SD=1.27), synchronous lectures using videos (4.05, SD=0.93), recorded lectures (M=3.88, SD=1.04),

assignments (M=3.64, SD=0.84), reporting (M=3.55, SD=1.05), and oral recitation (M=3.63, SD=1.03). Meanwhile, alternative teaching tactics such as group projects (M=3.32, SD=1.12), synchronous lectures using chat (M=3.16, SD=1.34), assignments (M=3.64, SD=0.84), and symposiums/seminars (M=3.31, SD=1.32) were all widely seen as 'Somewhat Helpful' by the students who participated in the study.

3.6. Part VI: Possible Interventions for Improving the Online Learning Environment

Table 12. Perceived Importance of Possible Interventions for Improving the Online Learning Environment.

Items	Mean	SD	Interpretation
1. The government must provide additional free internet hubs.	3.53	0.68	Absolutely Essential
2. The university must improve its internet connection.	3.72	0.53	Absolutely Essential
3. Provide student services similar to those found in a conventional institution (e.g., counselling) to online distance learners	3.09	0.76	Very Important
4. If possible, instructors must suggest YouTube videos in which content are same with the current topics for uniform and further resources of students.	2.92	0.86	Very Important
5. Make the classes and lessons interesting for students despite being limited online.	3.39	0.74	Very Important
6. Provide assistance to students who are having financial difficulty to join online classes.	3.24	0.81	Very Important
7. Give chance to student's missed activities/requirements/quizzes and exams due to poor internet connection/technical problems.	3.67	0.56	Absolutely Essential
8. Give consideration to students in terms of number of activities given per subject to avoid overload requirements.	3.66	0.55	Absolutely Essential
9. Give a week time interval as deadline for submission of requirements.	3.52	0.65	Absolutely Essential
10. Instructors must provide feedbacks to students works and performance in the given subject.	3.38	0.73	Very Important
11. Instructors must give clear instructions and criteria with their given activities for students to work on.	3.61	0.53	Absolutely Essential
12. Instructors must entertain student's questions/inquiries/problems regarding the topics discussed and activities given.	3.63	0.51	Absolutely Essential
13. The University must provide training especially to teachers who are not tech-savvy.	3.29	0.82	Very Important
14. Instructors must meet the expected knowledge that students should gain/get/learn.	3.29	0.72	Very Important
15. The University must provide a short academic break within the semester.	3.68	0.66	Absolutely Essential
Total Average Mean	3.45	0.678	Very Important

Scaling: 0-0.6=Not Important; 0.7-1.3=Little Importance; 1.4-2.0; Average Importance=2.1-2.7; Very Important=2.8-3.4; 3.5- 4.0=Absolutely Essential.

The table above summarizes respondents' opinions on the proposed interventions. The respondents believe that the interventions in statements 1, 2, 7, 8, 9, 11, 12, and 15 are 'absolutely essential' interventions. These include statements such as 'the government must provide additional free internet hubs' (M=3.53, SD=0.68); 'the university must improve its internet connection' (M=3.72, SD=0.53); 'give chance to student's missed activities/requirements/quizzes and exams due to poor internet connection/technical problems' (M=3.67, SD=0.56); 'give consideration to students in terms of number of activities given per subject to avoid overload requirements' (M=3.66, SD=0.55); 'give a week time interval as deadline for submission of requirements' (M=3.52, SD=0.65); 'instructors must give clear instructions and criteria with their given activities for students to work on' (M=3.61, SD=0.53); 'instructors must entertain student's questions/inquiries/problems regarding the topics discussed and activities given' (M=3.63, SD=0.51); 'the University must provide a short academic break within the semester' (M=3.68, SD=0.66).

The respondents meanwhile consider that the interventions in statements 3, 4, 5, 6, 10, 13, and 14 are 'very important' interventions. These include statements such as 'provide student services similar to those found in a conventional institution to online distance learners' (M=3.09, SD=0.76);

'if possible, instructors must suggest YouTube videos in which content are same with the current topics for uniform and further resources of students' (M=2.92, SD=0.86); 'make the classes and lessons interesting for students despite being limited online' (M=3.39, SD=0.74); 'provide assistance to students who are having financial difficulty to join online classes' (M=3.24, SD=0.81); 'instructors must provide feedbacks to students works and performance in the given subject' (M=3.38, SD=0.73); 'the University must provide training especially to teachers who are not tech-savvy' (M=3.29, SD=0.82); and 'instructors must meet the expected knowledge that students should gain/get/learn' (M=3.29, SD=0.72).

4. Discussion

The current study investigates the difficulties that students in Mindanao State University, Main Campus encountered while learning in an online setting, as well as the impact that the pandemic had on their online learning experience. Based on the findings, the pandemic has exacerbated students' difficulties, particularly in terms of the quality of their learning experience. The current study has added to the findings of previous studies [1, 11, 12, 16, 23, 25, 31] regarding the pedagogical, logistical, and technological

online learning challenges that students face. This study also added to the body of knowledge about online learning by identifying the presence and intensity of online learning problems.

The findings indicate that online learning challenges and techniques were mediated by the resources that were made accessible to them, mainly their access to the internet, and their interactions with their professors. In the context of the pandemic, the imposed lockdowns, as well as students' socioeconomic circumstances, exacerbated the difficulties that students were already facing as can be seen from the different responses when it comes to connecting to the internet. Majority of the respondents only had moderately fast or slow internet which may have exacerbated their challenges.

When it comes to online learning, most research have found that technology use and proficiency are the most prevalent problems that students experience [27]. As a result of these findings, it appears that online learning challenges during the pandemic differ in certain ways from the regular challenges that students encounter in a pre-pandemic online learning environment. One possible reason for this outcome is that the respondents' inability to travel to and from school or other learning environments outside of their immediate region may have exacerbated the difficulty of the task. Additional research is required to determine the influence of mobility limits on students' online learning experiences. In many cases, these students attributed their inability to access the Internet, instructional materials, and equipment necessary for online study to a lack of available financial resources. When applying and extending the findings of this study to other contexts, particularly those from higher socioeconomic strata, attention should be exercised to avoid bias.

5. Limitations

This study was prone to selection bias, as students without access to the internet and those who were badly impacted by the epidemic may have missed out on our survey. During the study period, social distancing measures had already been implemented, restricting questionnaire distribution in person. Thus, the projected technological resource shortage was almost certainly underestimated. Self-reporting bias could also have influenced responses. Another constraint was the use of a self-developed survey questionnaire, which was necessary given the sharpness of the conditions, the urgency of data collection, mobility restrictions, and the limited resources available to the researchers because of this pandemic. Nonetheless, the extensive data we were able to collect from a broad sample of university students met a critical need identified by schools and instructors across the country. Finally, this study examined the impediments to online learning and their relative importance to students. This study did not examine students' expectations or motives in learning all of which impact their overall learning experience.

6. Recommendations

The findings in this study demonstrates that the barriers to online learning in developing nations are multifaceted and inextricably linked, even more so during times of global health crises. As such, a holistic approach is required to handle these impediments effectively.

The researchers make the following recommendations after examining the respondents' recommended interventions: (1) Conduct a needs assessment of university students to determine if they lack access to technology tools. (2) Keep communication channels open between administrators, instructors, and students (e.g., through online meetings). The norms and expectations must be clear, with measures for ameliorating the pandemic situation. (3) Whenever possible, to transmit content asynchronously in order to keep technical and data requirements to a minimum. Compatibility with smartphones is still crucial. (4) Create significant chances for peer and educator interaction. These may include synchronous sessions to handle difficult subject- matter inquiries from students, asynchronous discussion boards, periodic feedback on tests, and mentorship sessions. (5) Throughout the transition process, make use of curated online resources that are available for free or with an institutional membership. Assist and train teachers in the creation, management, and delivery of content in order to maintain the online curriculum's viability. Make a financial commitment to technical assistance. (6) Modify assessment instruments and other courses to ensure that they are proportionate to and related to intended learning outcomes. Rather than a single, high-stakes examination, it is recommended that more frequent formative examinations be used. (7) Extend forbearance to students who have additional responsibilities at home. For example, they may be provided reasonable additional time to complete assigned tasks. If they are unable to participate in synchronous sessions, they must be offered alternative modes of instruction. (8) Ensure students' psychosocial well-being on a proactive basis. Create mental health programs that place a premium on the development of appropriate coping skills in the face of adversity. (9) Reduce tuition and provide scholarships to alleviate the pandemic's economic strain. Encourage the government to raise its subsidies. (10) For courses with associated learning activities, build bridging programs to facilitate a gradual return to clinical activity. Consider the establishment of simulation labs and other infrastructure that permits face-to-face learning while retaining social distance.

References

- [1] Adarkwah MA. "I'm not against online teaching, but what about us?" ICT in Ghana post COVID-19. *Education and Information Technologies*. 2021; 26 (2): 1665-1685.
- [2] Almaiah MA, Al-Khasawneh A, Althunibat A. Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and Information Technologies*. 2020; 25: 5261-5280. doi: 10.1007/s10639-020-10219.

- [3] Araujo T, Wonneberger A, Neijens P, de Vreese C. How much time do you spend online? Understanding and improving the accuracy of self-reported measures of Internet use. *Communication Methods and Measures*. 2017; 11 (3): 173-190.
- [4] Barrot, J. S. (2016). Using Facebook-based e-portfolio in ESL writing classrooms: Impact and challenges. *Language, Culture and Curriculum*, 29 (3), 286–301.
- [5] Barrot, J. S. (2020). Scientific mapping of social media in education: A decade of exponential growth. *Journal of Educational Computing Research*. 10.1177/0735633120972010.
- [6] Barrot, J. S. (2021). Social media as a language learning environment: A systematic review of the literature (2008–2019). *Computer Assisted Language Learning*.
- [7] Boelens R, De Wever B, Voet M. Four key challenges to the design of blended learning: A systematic literature review. *Educational Research Review*. 2017; 22: 1–18.
- [8] Buehler MA. Where is the library in course management software? *Journal of Library Administration*. 2004; 41 (1–2): 75–84. doi: 10.1300/J111v41n01_07. [CrossRef] [Google Scholar].
- [9] Carter RA, Jr, Rice M, Yang S, Jackson HA. Self-regulated learning in online learning environments: Strategies for remote learning. *Information and Learning*.
- [10] Cavanaugh CS, Barbour MK, Clark T. Research and practice in K-12 online learning: A review of open access literature. *The International Review of Research in Open and Distributed Learning*. 2009; 10 (1): 1–22. doi: 10.19173/irrodl.v10i1.607. [CrossRef] [Google Scholar].
- [11] Copeland WE, McGinnis E, Bai Y, Adams Z, Nardone H, Devadanam V, Hudziak JJ. Impact of COVID-19 pandemic on college student mental health and wellness. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2021; 60 (1): 134–141.
- [12] Day T, Chang ICC, Chung CKL, Doolittle WE, Housel J, McDaniel PN. The immediate impact of COVID-19 on postsecondary teaching and learning. *The Professional*.
- [13] Donitsa-Schmidt S, Ramot R. Opportunities and challenges: Teacher education in Israel in the COVID-19 pandemic. *Journal of Education for Teaching*. 2020; 46 (4): 586–595.
- [14] Drane, C., Vernon, L., & O’Shea, S. (2020). The impact of ‘learning at home’ on the educational outcomes of vulnerable children in Australia during the COVID-19 pandemic. Literature Review Prepared by the National Centre for Student Equity in Higher Education. Curtin University, Australia.
- [15] Elaish M, Shuib L, Ghani N, Yadegaridehkordi E. Mobile English language learning (MELL): A literature review. *Educational Review*. 2019; 71 (2): 257–276.
- [16] Fawaz, M., Al Nakhal, M., & Itani, M. (2021). COVID-19 quarantine stressors and management among Lebanese students: A qualitative study. *Current Psychology*, 1–8. [PMC free article] [PubMed].
- [17] Franchi T. The impact of the COVID-19 pandemic on current anatomy education and future careers: A student’s perspective. *Anatomical Sciences Education*. 2020; 13 (3): 312–315. doi: 10.1002/ase.1966. [PMC free article] [PubMed] [CrossRef] [Google Scholar].
- [18] Garcia R, Falkner K, Vivian R. Systematic literature review: Self-regulated learning strategies using e-learning tools for computer science. *Computers & Education*. 2018; 123: 150–163. doi: 10.1016/j.compedu.2018.05.006. [CrossRef] [Google Scholar].
- [19] Gonzalez T, De La Rubia MA, Hincz KP, Comas-Lopez M, Subirats L, Fort S, Sacha GM. Influence of COVID-19 confinement on students’ performance in higher education. *PLoS ONE*. 2020; 15 (10): e0239490. doi: 10.1371/journal.pone.0239490. [PMC free article].
- [20] Hew KF, Jia C, Gonda DE, Bai S. Transitioning to the “new normal” of learning in unpredictable times: Pedagogical practices and learning performance in fully online flipped classrooms. *International Journal of Educational Technology in Higher Education*. 2020; 17 (1): 1-22.
- [21] Huang Q. Comparing teacher’s roles of F2F learning and online learning in a blended English course. *Computer Assisted Language Learning*. 2019; 32 (3): 190–209.
- [22] John Hopkins University. (2021). *Global map*. <https://coronavirus.jhu.edu/>
- [23] Kapasia N, Paul P, Roy A, Saha J, Zaveri A, Mallick R, Chouhan P. Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal. *India. Children and Youth Services Review*. 2020; 116: 105194.
- [24] Kebritchi M, Lipschuetz A, Santiago L. Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems*. 2017; 46 (1): 4–29. doi: 10.1177/0047239516661713. [CrossRef] [Google Scholar].
- [25] Khalil R, Mansour AE, Fadda WA, Almisnid K, Aldamegh M, Al-Nafeesah A, Al-Wutayd O. The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students’ perspectives. *BMC Medical Education*. 2020; 20 (1): 1–10. doi: 10.1186/s12909-020-02208-z. [PMC free article] [PubMed] [CrossRef] [Google Scholar].
- [26] Pham T, Nguyen H. COVID-19: Challenges and opportunities for Vietnamese higher education. *Higher Education in Southeast Asia and beyond*. 2020; 8: 22–24. [Google Scholar].
- [27] Rasheed RA, Kamsin A, Abdullah NA. Challenges in the online component of blended learning: A systematic review. *Computers & Education*. 2020; 144: 103701.
- [28] Recker MM, Dorward J, Nelson LM. Discovery and use of online learning resources: Case study findings. *Educational Technology & Society*. 2004; 7 (2): 93–104. [Google Scholar].
- [29] Seplaki CL, Agree EM, Weiss CO, Szanton SL, Bandeen-Roche K, Fried LP. Assistive devices in context: Cross-sectional association between challenges in the home environment and use of assistive devices for mobility. *The Gerontologist*. 2014; 54 (4): 651–660.
- [30] Simbulan N. COVID-19 and its impact on higher education in the Philippines. *Higher Education in Southeast Asia and beyond*. 2020; 8: 15–18. [Google Scholar].
- [31] Singh K, Srivastav S, Bhardwaj A, Dixit A, Misra S. Medical education during the COVID-19 pandemic: a single institution experience. *Indian Pediatrics*. 2020; 57 (7): 678–679.

- [32] Singh V, Thurman A. How many ways can we define online learning? A systematic literature review of definitions of online learning (1988–2018) *American Journal of Distance Education*. 2019; 33 (4): 289–306.
- [33] Spector P. Using self-report questionnaires in OB research: A comment on the use of a controversial method. *Journal of Organizational Behavior*. 1994; 15 (5): 385–392. doi: 10.1002/job.4030150503. [CrossRef] [Google Scholar].
- [34] Suryaman M, Cahyono Y, Muliansyah D, Bustani O, Suryani P, Fahlevi M, Munthe AP. COVID-19 pandemic and home online learning system: Does it affect the quality of pharmacy school learning? *Systematic Reviews in Pharmacy*. 2020; 11: 524–530. [Google Scholar].
- [35] Tallent-Runnels MK, Thomas JA, Lan WY, Cooper S, Ahern TC, Shaw SM, Liu X. Teaching courses online: A review of the research. *Review of Educational Research*. 2006; 76 (1): 93-135.
- [36] Tang, T., Abuhmaid, A. M., Olaimat, M., Oudat, D. M., Aldhaeabi, M., & Bamanger, E. (2020). Efficiency of flipped classroom with online-based teaching under COVID-19. *Interactive Learning Environments*, 1–12.
- [37] Usher M, Barak M. Team diversity as a predictor of innovation in team projects of face-to-face and online learners. *Computers & Education*. 2020; 144: 103702.
- [38] Varea, V., & González-Calvo, G. (2020). Touchless classes and absent bodies: Teaching physical education in times of COVID-19. *Sport, Education and Society*, 1–15.
- [39] World Health Organization (2020). *Coronavirus*. https://www.who.int/health-topics/coronavirus#tab=tab_1
- [40] Xue, E., Li, J., Li, T., & Shang, W. (2020). China's education response to COVID-19: A perspective of policy analysis. *Educational Philosophy and Theory*, 1–13.