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Assessing the Perceptions and Preferences between Online and In-Person Classroom Learning among University Students in Rwanda

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Abstract

The COVID-19 pandemic has resulted in many schools rapidly rolled out online learning due to school closure or lockdown. This study assessed the online learning experience of 193 students in different universities of Rwanda during COVID-19. The reported main advantages of online learning revolved around the comfortability and self-responsibility in their studies. However, internet access and stability remained the biggest challenges. Respondents reported online learning not stimulating, lacked interactions with other students and with instructors, and they were distracted easily and had difficulty to maintain their discipline. Many students indicated they prefer in-person classes over online learning. Investment to provide students stable internet access and to training instructors to design more interactive and engaging online learning materials according to best practices could improve the students' online experience. The use of blended online and in-person classroom learning to maximize students learning experiences and outcomes should be explored.

Keywords

Online Learning, Higher Education, Rwanda, Students, Covid-19

1. Introduction

Since first discovered in December 2019, the Sars-CoV-2 Coronavirus has spread around the globe and has caused many school closures temporarily (WHO, 2020)—inevitably disrupted learning. Many schools have resorted to delivering teaching via online platforms.

Globally, e-learning has grown over the past several years as technology advances and the internet becomes more available (Brandon Hall Group, 2003; O'Neill, Singh, & O'Donoghue, 2004; Biel & Brame, 2016; Allen & Seaman, 2017). In 2014, over 5.8 million students participated in online classrooms either via asynchronously (learners studying the materials completely at their own time) or synchronous (learners meet in real time via an online platform) (Ryan, 2001; Allen & Seaman, 2016). While online learning offers flexibility, convenience for both instructors and students in timing and location, and has the potential to reach students with limited access to higher education due to socioeconomic, financial, educational, and personal reasons (Davis, 2000; Hara & Kling, 2000; Haugen et al., 2001; Liaw & Huang, 2002; Chen et al., 2010; Flowers et al., 2012; Hansen & Reich, 2015; Willging & Johnson, 2009; Biel & Brame, 2016; Seaman et al., 2018), studies have shown some online delivery formats that could diminish the student experience, impair the ability of students to connect with faculty, decrease instructional quality, and minimize instructor-learner interactions (Hara & Kling, 2000; Laine, 2003). Students may also feel isolation, frustration, anxiety, and confusion (Hara & Kling, 2000; Piccoli, Ahmad, & Ives, 2001). E-learning also requires learners to have greater discipline and self-motivation to make a time commitment to learning; higher student attrition rates were commonly found in online learning (Frankola, 2001; Laine, 2003; Ryan, 2001; Golladay, Prybutok, & Huff, 2000; Serwatka, 2003). Large scale study in the USA did not show if online learning is superior as a medium compared to face-to-face classes (Means, Toyama, Murphy, Bakia, & Jones, 2010).

Although e-learning has been growing rapidly globally, it remains at an early stage of development in most African countries, largely due to insufficient infrastructure, connectivity, and materials (Koohang & Durante, 2003; Harerimana & Mtshali, 2017; Harerimana & Mtshali, 2018; Ndayambaje, 2014). During the current pandemic, many schools rapidly rolled out online learning due to school lockdown, understanding on how students perceived and reacted to e-learning was necessary, yet was not conducted before. Accordingly, this study was conducted to assess how students compare the learning platforms and to understand the challenges they faced. An online survey was conducted to collect university students' perception on their online learning experiences. The results of the study can inform future design of effective and appropriate e-learning programs in Rwanda.

2. Materials and Methods

2.1. Setting

Rwanda has a population of about 12 million people, with about 4 million (40%) within the age of 16 to 30 years (National Institute of Statistics of Rwanda, 2015). As of 2018, there were 89,160 students enrolled in 40 higher education institutions (Rwanda Ministry of Education, 2018).

2.2. Design and Sample

The study utilized a non-probability sampling method. An online survey was sent to students who were 18 years old or above, were enrolled in academic programs in universities in Rwanda and had taken online courses in Rwanda from February to April 2021. The recipients were encouraged to share the link to other people who fulfilled the selection criteria.

2.3. Data Collection Tool and Method

The survey tool was developed based on the Course Experience Questionnaire (CEQ) and some other similar questionnaires used in other studies (Smart & Cappel, 2006; Wang & Liu, 2019; Gurpinar, Alimoglu, Mamakli, & Aktekin, 2010). There were three parts in the survey. Part 1 included five demographic information. Part 2 contained 17 statements related to the participants' perceptions and experience related to online compared to in-person learning. Respondents could choose one of the five options for each statement on a five-point Likert scale: "strongly disagree", "disagree", "neither agree or disagree", "agree" and "strongly agree". Two open-ended questions were included in part 3 to ask respondents to provide the challenges they faced in online learning and other comments. The survey was developed and offered in English, and it took about 10 minutes to complete. The first page of the survey included the information of the study and a statement of consent. Participants were required to fill the checkbox, which served as a proxy for written consent. The study was approved by the University of Global Health Equity Institutional Review Board.

2.4. Measures

The key measures of the study were the percentages of strongly agreed/agreed and strongly disagreed/disagreed with each of the statements.

2.5. Data Management and Analysis

Data collected from the online survey were downloaded to excel format. It was cleaned and coded before being uploaded to SPSS for analysis. Descriptive statistics were used to summarize the demographic data and the key measures. One sample binomial proportion tests were used to detect differences between the proportion of strongly agree/agree and strongly disagree/disagree answers for each statement on their perception about online versus in-person learning. All quantitative data analyses were conducted using SPSS v.26, with the P-value set at 0.05. Content analysis was conducted to summarize the themes from the two open-ended questions.

3. Results

A total 193 people attempted to complete the survey, three were removed since they did not answer any of the questions. The final sample contained 190 samples. The average age was 21.9 years old, with 161 (87.5%) of them 25 years old

or younger. Among all the respondents, 110 (57.9%) were female, 168 (88.4%) were in undergraduate programs, about half (n = 91, 49.5%) had never taken online courses before COVID-19, and the majority of them were taking synchronized (n = 106, 56.4%) or combination of synchronized and asynchronized courses (n = 45, 23.9%) (Table 1).

There was no statistical significance detected between the percentages of respondents who agreed/strongly agreed and those who disagreed/strongly disagreed on seven statements: 1) 46.6% agreed/strongly agreed "I can understand the content better in online learning" versus 53.4% disagreed/strongly disagreed ($P = 0.488$); 2) 45.5% agreed/strongly agreed "I need less time and effort to learn the same amount of material in online learning" versus 54.5% disagreed/strongly disagreed ($P = 0.316$); 3) 46.5% agreed/strongly agreed "Online classes improve my communication skills" versus 53.5% disagreed/strongly disagreed ($P = 0.45$); 4) 46.9% agreed/strongly agreed "I receive sufficient feedback from instructor in online courses" versus 53.1% disagreed/strongly disagreed ($P = 0.51$); 5) 53.4% agreed/strongly agreed "Online courses develop my ability as team player" versus 46.6% disagreed/strongly disagreed ($P = 0.456$); 6) 55.1% agreed/strongly agreed "Online courses encourage me to value perspectives other than my own" versus 44.9% disagreed/strongly disagreed ($P = 0.268$); and 7) 47.1% agreed/strongly agreed "I can easily ask questions when I don't understand" versus 52.9% disagreed/strongly disagreed ($P = 0.551$) (Table 2).

Significantly more respondents agreed/strongly agreed on the following three statements: 1) "I am more relaxed and comfortable in online classes" (62.4%, $P = 0.003$); 2) "Online courses develop my ability to plan my own work" (78.1%, $P < 0.001$); and 3) "Online courses develop my confidence to investigate new ideas" (67.6%, $P < 0.001$) (Table 2).

Table 1. Table summarizing the sample demographic information.

Sample		N (%)
		190
Age	Mean (SD)	21.9 (3.4)
	25 or younger	161 (87.5%)
	Older than 25	23 (12.5%)
Gender	Female	110 (57.9%)
	Male	80 (42.1%)
Education level	Undergraduate	168 (88.4%)
	Graduate	22 (11.6%)
Online learning before COVID-19	No	91 (49.5%)
	Yes	93 (50.5%)
Type of online	Asynchronized	37 (19.7%)
	Synchronized	106 (56.4%)
	Both	45 (23.9%)

Table 2. Table summarizing the results on online versus face-to-face learning experiences.

		(Strongly) disagree	(Strongly) agree	*p*-value
1	I can understand the content better in online learning	71 (53.4%)	62 (46.6%)	0.488
2	Online learning stimulates my interest more	95 (68.3%)	44 (31.7%)	<0.001*
3	I need less time and effort to learn the same amount of material in online learning	78 (54.5%)	65 (45.5%)	0.316
4	Student discussion is better in online learning	134 (78.8%)	36 (21.2%)	<0.001*
5	Student presentation as part of learning is better in online learning	111 (71.6%)	44 (28.4%)	<0.001*
6	Teacher-student interaction is better in online learning	125 (78.1%)	35 (21.9%)	<0.001*
7	I am more relaxed and comfortable in online classes	56 (37.6%)	93 (62.4%)	0.003*
8	Online classes help me to prepare my exam better	98 (71.5%)	39 (28.5%)	<0.001*
9	Online classes improve my communication skills	76 (53.5%)	66 (46.5%)	0.450
10	I receive sufficient feedback from instructor in online courses	78 (53.1%)	69 (46.9%)	0.510
11	Online courses develop my ability as team player	68 (46.6%)	78 (53.4%)	0.456
12	Online courses develop my ability to plan my own work	32 (21.9%)	114 (78.1%)	<0.001*
13	Online courses develop my confidence to investigate new ideas	45 (32.4%)	94 (67.6%)	<0.001*
14	Online courses encourage me to value perspectives other than my own	62 (44.9%)	76 (55.1%)	0.268
15	I can easily ask questions when I don't understand	73 (52.9%)	65 (47.1%)	0.551
16	I retain information better from taking online course	107 (77%)	32 (23%)	<0.001*
17	Online courses help me to maintain my discipline in studying	97 (65.5%)	51 (34.5%)	<0.001*

* Significant at $P = 0.05$.

Significantly more respondents disagreed/strongly disagreed on the following seven statements: 1) "online learning stimulates my interest more" (68.3%); 2) "Student discussion is better in online learning" (78.8%); 3) "Student presentation as part of learning is better in online learning" (71.6%,); 4) "Teacher-student interaction is better in online learning" (78.1%); 5) "Online classes help me to prepare my exam better" (71.5%); 6) "I retain information better from taking online course" (77%); and 7) "Online courses help me to maintain my discipline in studying" (65.5%), all with $P < 0.001$ (Table 2).

Analysis of Open-Ended Questions

A total 179 comments and challenges were received through the two open-ended questions. Four main themes were identified:

Theme 1. Internet connectivity was the biggest challenge during online learning.

Among all the comments, 84 (46.9%) were related to slow internet connection, which inevitably affected their online learning experience.

"Connectivity issues make the experience less worthwhile" (26 years old, male, master).

"Online classes are conducted on the assumption that all students have a good

and strong internet connection, which is not true and as a result some students are left behind." (20 years old, female, undergraduate)

Theme 2. Students found online learning lacked personal interactions.

Over 29% of the comments were related to students experiencing challenges in following or understanding the online instructions. When they had questions, they also found it difficult to ask questions.

"Sometimes you don't gain more clarification about the course while studying online but face to face really help, because when studying the instructor make more examples for us to understand well the course and we are free to even ask for any question, which is totally different from online classes by online classes sometimes there is also network issues and you find that you are not even able to access the course." (21 years old, female, undergraduate)

"Generally, challenges are related to not being able to ask all questions for clarification. Also, about virtual discussion among." (20 years old, female, undergraduate)

Theme 3. Students found it difficult to concentrate on online instructions.

About 20% of respondents mentioned that they were distracted during online instructions. They were less concentrated or motivated in taking online classes compared to in-person face-to-face lessons.

"Generally, challenges are related to not being able to ask all questions for clarification…also challenges in virtual discussion among." (19 years old female, undergraduate)

"Home distractions also affected my studies during online learning." (19 years old, male, undergraduate)

Theme 4. Respondents preferred in-person classes over online courses.

Over 30% of respondents mentioned that they preferred in-person classes.

"The face-to-face learning is way much better than the online classes." (21 years old, female, undergraduate)

"Sometimes you don't gain more clarification about the course while studying online but face to face really help, because when studying the instructor make more examples for us to understand well the course and we are free to even ask for any question, which is totally different from online classes by online classes sometimes there is also network issues and you find that you are not even able to access the course." (21 years old, female, undergraduate)

4. Discussion

During the 2020 COVID pandemic, schools in Rwanda had resorted to delivering classes online. The social distancing restrictions during the COVID pandemic had highlighted the previously documented advantages of online learning being flexible in learning location compared to in-person classes (Sinclair, Kabke, & Jones, 2015; Carrard, Martins, Molina-Bastos, & Gonçalves, 2017; Goffard, Odou, Aliouat-Denis et al., 2019). However, being able to deliver the classes is only one aspect of teaching and learning. Our study intended to assess

the online learning experience of students in Rwanda. The results of our study showed there was no significant difference in understanding the contents through learning online versus in-person. Similarly, they reported they spent about the same amount of time and effort in studying whether it was taking online or in-person classes. Previous studies have also drawn inconclusive results on the effectiveness of online compared to in-person classes (Means, Toyama, Murphy, Bakia, & Jones, 2010; Furió, Juan, Seguí, & Vivó, 2015; Bavaresco et al., 2019; Biel & Brame, 2016).

However, statistically more respondents have reported that they were more relaxed and comfortable in online classes. Naturally, in online courses, students took the classes at the locations of their own choices. That generally means a more comfortable and relaxed environment. Students also reported that online learning could help them to develop their ability to plan their own work, and to improve their confidence in investigating new ideas. In general, academic success relies on students' motivation to acquire new skills (Jacobs & Newstead, 2000). Study had shown allowing students to work at their own pace could enhance their motivation to learn (Goffard et al., 2019). Online learning to a larger extent has less instructor-student and student-student interactions, such a learning environment pushes students to take on more initiatives to learn and investigate on their own. As stated in early research, motivation is a key factor in promoting life-long learning (McCombs, 1991) and computer literacy is a main competency in learning in the 21st century (Kozma, 2003), online learning may have the potential to promote students' ability to become life-long learners. Further studies in this area could be conducted in the future.

Despite the benefits of online learning, our results also showed a significant percentage of respondents found online learning was not stimulating and found themselves easily distracted. Online classes can be in many different formats, including synchronized video conferencing, to pre-recorded asynchronized instructional videos, text-based chat, and threaded discussion (Newberry, 2001). Studies have suggested many best practices that can reduce distractions, including using shorter videos to avoid overload, organizing words and pictures, and combining narration with animation simultaneously as visual cues to highlight essential information (Goffard et al., 2019; Mayer & Fiorella, 2014). Studies have also found students tend to react more positively to some video styles. Lecture slides with illustrations and animations that visualized content were better received by students compared to those with many texts and no illustrations (Choe, Scuric, & Eshkol et al., 2019; Kirkwood & Price, 2014; Morton et al., 2016). These principles should be followed when producing online resources even though this may require more effort in production.

Many of our respondents also reported they had difficulties in student discussion, presentation, teacher-student interactions, exam preparation, information retention and maintaining their discipline in studying. By nature, online classes do not have in-person interactions between participants, some studies

have shown students rarely using online forums like discussion boards to interact with other students or with the lecturer (van Doorn & van Doorn, 2014) and that poses certain challenges to some learning activities. Many studies have shown some class activities including debates, group presentations, practical were much better conducted in face-to-face settings (Moule, Ward, & Lockyer, 2010; Howlett et al., 2011; Edginton & Holbrook, 2010; Beale, Tarwater, & Lee, 2014). Studies have shown that most students not only liked the classroom face to face interactions, but also found such activities increased their level of enthusiasm for independent working (Peine, Kabino, & Spreckelsen, 2016; Woltering, Herrler, Spitzer, & Spreckelsen, 2009). Studies have also shown in-person classes were superior in providing immediate feedback and tailored messages, detecting visual cues via body language, and relaying communicator feelings or emotions (Newberry, 2001). Our study results were consistent with some of these previous findings.

Probably the most obvious questions about online learning are access to and use of information technology. In this study, the most frequently reported challenges during their online learning experience were internet access and stability. Network infrastructure is one of the three main elements in implementing e-learning, alongside information and communication technology knowledge and content development (Aung & Khaing, 2015). According to the World Bank, only 22% of the population in Rwanda have access to the internet (The World Bank Data, 2019). Similar to other studies, most students in our study found it difficult to do online courses when having limited access to a stable internet (Cabual & Cabual, 2022). As e-learning is becoming a global trend, the Rwanda government as well as the education sector need to invest and be equipped in this basic yet essential infrastructure to allow a full experience of virtual class. As the COVID-19 pandemic persists, it is inevitable that some online teaching and learning will continue. Schools creating e-learning departments can help train instructors on how to use digital communication strategies, develop online educational materials to positively impact online learning experience.

For half of our participants of the study (49.5%), this was their first experience doing online learning, and many respondents indicated that they preferred in-person over online classes. Our results provided some initial insights on how students perceive online learning. However, the results of this study must be viewed considering some limitations. One, due to Covid pandemic, our study was conducted via an online survey, we could not avoid selection bias, and the sample size may not be generalizable to the entire student population. Students who did not have internet access to partake in online classes would be unlikely to participate in our survey. Two, the type of online learning during Covid lockdown were mostly synchronous (over 80%), presumably via zoom or other different online meeting platforms. Our study did not investigate the learning experience on the different types of e-learning formats. Future research in this

area may help design the best and context-specific online learning approach.

5. Conclusion

This study assessed the online learning experience of 193 students in different universities of Rwanda during COVID-19. The main advantages of online learning reported by the responses revolved around the comfortability and self-responsibility in their studies. However, internet access and stability remained the biggest challenges. While some reported e-learning promoted their ability to organize their own work, effort to promote student-student and student-instructor interaction is needed. Investment to provide students stable internet access and to training instructors to design more interactive and engaging online learning materials according to best practices would help maximize the online learning benefits. While online courses may have some benefits, especially during the pandemic, some important in-class experiences including debates and practical were difficult to execute via online format. The use of blended online and in-person classroom learning to maximize students learning experiences and outcomes should be explored. The generalizability of the study may be limited due to the relatively sample size and potential selection bias. Future investigation on the method of online learning formats should be conducted to inform future program design.

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Authors' Contributions

G. Nishimwe, S. Kamali, E. Gatesi conceptualized the study. All authors conducted the literature review, study design, data collection, interpretation of data, drafting and editing the manuscript. All authors have seen and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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