Managing COVID-19 Challenges: Strategies to Keep students Engaged in Online Learning - A Case study of Kepler

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Abstract

This article is about strategies devised by Kepler in reaction to challenges brought in by the covid-19 outbreak since its occurrence in 2019. Kepler instructors have devised a number of tools and strategies in order to cope up with the challenges and keep students engaged as the institution, like many others, had shifted from blended to online (or remote) learning. The study analyzed the effectiveness of the tools and strategies used to keep students engaged in remote learning. We collected data from 169 out of 174 students who were in the program, and 18 out of 25 instructors who were teaching during the pandemic time. Online surveys were sent to both students and teachers to collect quantitative data. The students and teachers involved in this study gave their views about the usefulness of the tools and strategies used, and the report shows that the tools contributed to students' engagement and helped them to curb the challenges they had faced. The study recommends the use of recording online tools such as vocaroo.com, speakpipe.com; self-paced quizzes, videos, podcasts, discussion boards, shared google docs, and strategies like peer reviews, feedback, icebreakers, warm up prompts, higher order thinking questions, and class final reflections, as the respondents reported that they helped them stay engaged, which would not have been possible if the instructors used the traditional lecture method and online group assignments only during the virtual teaching and learning. The findings in this paper will contribute to the improvement of online teaching and learning strategies.

Keywords— Tools, strategies, student engagement, remote learning, Kepler.

I. INTRODUCTION

The outbreak of COVID-19 affected the socio-economic wellbeing of different countries, individuals and organizations. For instance, UNICEF (2020) reports that COVID-19 pandemic has turned the world upside down and it affected the lives of people in every aspect of life, especially communication and interaction. Education has been one of the sectors affected by the measures imposed to stop the spread of COVID-19. Students and schools have been affected and many students could not attend in-person classes (Global Campaign for Education, 2020). This period of "pandemic teaching," as it has often been labeled, has been marked deeply by the failure to engage students learning remotely and help them develop necessary skills (Harrington and Bruler, 2021). This had a wide range of impacts on our community at large and the education system across the world (Lei and So, 2021; Johnson, Veletsianos, and Seaman, 2020).

To keep the train going, different institutions in the world have been figuring out how to transition teaching and learning to online, and teaching is undertaken remotely and on digital platforms (Li and Lalani, 2020). In Rwanda, the Government closed all public and private schools in March 2020, and the Ministry of Education provided online programs, and required universities to introduce online learning and teaching systems to keep on offering the same courses and supporting students (Carter, Leonard, Nzaramba, and Rose, 2020). Even though this initiative was helpful, some schools struggled to cope up with this newly introduced strategy considering the cost and requirements of online learning systems. The new model required students to work much more independently and take full responsibility for their learning. In addition, teaching online required the instructors to devise different strategies to keep the students engaged because some might have been distracted or tended to procrastinate their tasks (Terada,

2020). For the institutions that had been using a blended model of learning, this seemed to be an opportunity. However, despite several attempts by several teachers to identify ways to keep students engaged in online learning, much is yet to be explored in terms of identifying and using effective online learning and teaching strategies and in an innovative way.

Kepler, a higher institution of learning in Rwanda in partnership with The Southern New Hampshire University (SNHU), identified all the challenges brought in by the change, and devised ways to mitigate them by adopting a new approach to teaching and learning. This study aims at identifying not only the challenges instructors and students face during online learning, but also innovative strategies Kepler used and their effectiveness in order to keep students engaged.

This study is significant in that its findings will be used to improve online course delivery during unprecedented times. Education practitioners will refer to the effectiveness of the strategies used to strengthen good practices. Instructors who are in charge of student engagement will use the results from this study to ensure the effectiveness of their online teaching. Students will start from challenges to improve their engagement in remote learning. Other institutions will also learn from Kepler practices to improve their online teaching and learning practices.

Objectives

- To identify the challenges Kepler instructors and students faced while shifting to learning remotely

- To explain the strategies that the instructors used to help students stay engaged in online learning

- To evaluate the effectiveness of the strategies used by Kepler to cope up with teaching and learning during the COVID-19 pandemic.

II. LITERATURE REVIEW

2.1. Challenges deriving from Teaching online under COVID- 19

After the covid-19 pandemic hit the world late 2019, different institutions shifted from in-person classes to online learning. This brought in a wide range of challenges (Cao and Duru, 2020) including lack of internet connectivity, electricity, electronic devices especially in developing countries. Using humor, rhetorical questions, analogies, warm up prompts, repetition, and other persuasive techniques had contributed a lot to arousing enthusiasm, attracting students' attention, and maintaining student focus (Powers, 2005, Chesser, 2013, Smith and Wortley, 2017).

With the development of technological tools, instructors tried to use one tool or the other to motivate students and keep them engaged while learning online (Schuler, 2019). According to D'Angelo (2018), with the development of technological tools students are able to collaborate with peers and engage in higher-order thinking processes and, specifically, establish a sense of online presence and engagement. According to Perdue (2016), technology allows for more powerful demonstrations, and increases student engagement. When teachers at all education levels allow students to use tech tools in a blended learning environment, their level of engagement becomes high (Bolden, 2019). But how many schools could afford these tech tools? Using videos, audios and talks (VAT) helps a lot in keeping students engaged as these tools bring an added value to teaching and learning. Students find the teachings enjoyable and stay awake if they watch videos frequently. Brown (2019) requests the capitalization of videos as they boost student engagement when they watch them both inside and outside the classroom. Teachers and students can record their own videos and upload them to YouTube for others to review (Barnwell, 2021). This keeps them stay engaged as it combines a variety of interests and enthusiasms. However, as Hansen (2020) points out, it could be very challenging to keep online courses engaging and interesting without leveraging learning strategies, and availing internet connectivity in all schools. Teachers and students should also refer to the use of online podcasts, but sometimes they miss internet bundles. There is a great deal of podcasts that talk about various topics of study. Additionally, the use of google suite increased students' active participation (Kennis, 2017) as it enables them to discuss issues and share information through the use of google documents in which they write down notes and paste links of their recordings from live discussions. In most developing countries, this can't be reached without necessary equipment.

In addition, research has shown that not only poor connectivity, lack of electricity, and lack of devices contribute to student disengagement while learning online, but also home distractions, lack of experience in online learning, non-user-friendly learning management systems, and life commitments (Lomov, 2020, Stott, 2016) and using tools that both teachers and students are not familiar with (Rapanta, Botturi, and Goodyear, and Koole, 2020) affected the teaching and learning process. As it had been noticed by Chipchase et al. (2017), "the growth in the use of flexible online learning technologies appears to be contributing to disengagement because it reduces the amount of time students spend on campus or interacting face-to-face with other students and staff, p.37." Thus, online tools could have been helpful, if all households could be able to afford

electricity, good internet connection (Ubaid, 2018) and technological devices, and if teachers and students had been trained in that process (Rapanta et al. 2020) to be professionally honed.

2.2 Trying to find solutions

While teaching online or in a blended model, the frequently asked questions are related directly to strategies that teachers can use to keep their students engaged. In order to ensure that students are staying engaged in online learning, institutions need to look for appropriate tools to use and devise ad hoc learning strategies. The main strategies are those that will push students to think critically, such as promoting interaction between students, asking open-ended questions, allowing reflection time, and using real life problems or scenarios (Matthew, 2019, Priyadarshan et al., 2015). Synchronous learning requires the use of multiple tools and techniques (Rugani and Grijalva, 2020). Institutions mainly start by transforming the way the lessons were set in order to facilitate online delivery. They also need to create interactive courses (Peterson-Ahmad and Keely, 2021) by using online tools such as canvas.com, google documents created in google drive, and by including auto-paced quizzes, audios and videos in the learning management system. The adoption of online platforms such as meet google.com or zoom.com helps a lot while allocating breakout rooms when the instructors want to conduct small group discussion (Carnegie Mellon University, 2022). Furthermore, institutions refer to teaching and learning strategies that enhance students' engagement. The strategies may vary from institution to institution, but the most needed is to find classroom techniques tailored to make students engaged with the learning process.

Foster (2016) advises that if teachers want to shake up online discussion, they have to challenge the students to use different technology tools that prompt visual responses and interactions on discussion boards. Students who are engaged are usually thinking, talking, enthusiastic and interested (Perdue, 2016). Current researchers advise that teachers need to diversify instructional activities in order to increase student engagement and rigor (Coburn, 2021). Teachers should devise ways that enable students to interact with the content and make reflections. Reflections are very important in engaging students (Purdue University, 2021, Matthew, 2019, Priyadarshan et. al, 2015, Dyment and O'Connell, 2011). This chases away boredom and brings in activeness and enthusiasm because boredom is a result of lack of motivation and inspiration to engage in an interactive activity (Muller, 2020). In the process of teaching and learning, teachers need to include *speaking activities* in which students explain key concepts, give

examples, reflect and present about case studies in order to increase their critical thinking and engagement (Priyadarshan et al., 2015). Other activities include the use of self-paced quizzes, and involving students in peer review of their works, in order to proofread them for further editing. Teachers do not only diversify instructional methods and activities, but they also need to regularly change the pairing and grouping of students (Carnegie Mellon University, 2022). This facilitates collaboration within the group work as students are not partnered in a monotonous way. Finally, teachers have to diversify the content delivery by using *short videos*. The use of online videos help in delivering learning materials such as MOOCs (Brame, 2005). After watching the videos, listening to audios, and reading various resources, the students share out what they got from their research. They can do that by recording themselves (Richard and Costello, 2020) via online recording softwares such as speakpipe.com or vocaroo.com. The use of all these strategies encourages the students to interact with the content in multiple ways, but where possible, the state or schools need to avail related infrastructures and equipment.

2.2.1. Tools to keep online learning engaging

One way the instructors prefer to engage students is the use of online quizzes. Ross, Chase, Robbie, Oates and Absalom (2018) concluded their research on adaptive quizzes arguing that quizzes "have value to increase student motivation and engagement" especially in the changing higher education where courses are being offered partially or entirely online, and make use of technology for delivery or assessment. Different authors (Urtel et al., 2006, Hughes, Salomonson and Metcalfe, 2020, Schmidt, Sanchez and Dickerson, 2017) recommend the instructors to use quizzes if they want to engage students in online learning.

Technology tools are also used by teachers to get students to work together and connect with the world outside the classroom (Best, 2020). Self-recorded stories are used especially at the beginning of a lesson to inspire students and connect their previous knowledge to new concepts. Recorded stories and audio podcasts offer several benefits for student engagement (Supanakorn-Davila and Bolliger 2014) and allow students to showcase their creativity and gain new skills. Research suggests that to attract students' attention teachers should refer to the use of audio podcasts that are present online as they provide information in a fun and entertaining way (Riley, 2019); thus, increasing student engagement. Podcasts help students to develop intensive listening skills. Videos play a big role for student engagement. According to Harris (2020) instructors scrambled to the use of technological and other multifaceted tools in order to be able to conduct their classes remotely and promote student engagement during lockdown or when

they faced circumstances that prevented students from attending physical classes. Videos helped a lot in delivering Massive Open Online Courses or MOOCs (Brame, 2005), and in generating student submissions.

Different platforms have been being used by teachers to keep student engagement. Teachers have been referring to using breakout rooms in google meet or zoom (Valenzuela, 2020; Mueller, 2020). These platforms helped maintain the academic rigor and intellectual vibrancy of the classroom (University of Pittsburgh, 2020).

2.2.2. Strategies

The first arrangement for carrying out the online teaching and learning is transforming lesson plans (LPs) from in-person into online versions. For a lesson to be effective, it needs to accomplish its goal. Students should be able to meet the objectives or goals by the end of the lesson. Thus, instructors must set the lesson plans that reflect what students need to achieve by the use of the backward design model as proposed by Wiggins and McTighe (2005). Also, lessons should be aligned with the learning objectives because alignment in a lesson plan ensures that all the components are working together to support student success (Zaur, 2021). That is, every part of the lesson should help the students reach the objectives and become competent at the learned skills. In a lesson plan, that means you start with the objectives, move to the assessment or independent practice, and then complete the rest of the lesson plan activities (Wiggins and McTighe, 2005). Start with what students need to do in order to prove they have mastered the objectives, then plan the activities you will use to help them gain that mastery of knowledge and skills. Also, show the platforms that will be used for students to carry out class activities, and what the instructor will be doing at every stage of the lesson in order to support the students.

Jigsaw is another learning strategy that increases student engagement as students are distributed in breakout rooms. Each student in a group is given a piece to discuss. Students meet with members from other groups who are assigned the same piece, and after mastering the material, return to the initial group and teach the material to their group members. Foster (2016), and Valenzuela, (2020) advise instructors to have students work in small groups of 3 to 4 and discuss chunks of the content and write about something that no-one else is tackling. Jigsaw helps students stay engaged and develop confidence. It promotes learning and increases student motivation and enjoyment of the learning materials as they learn by doing.

Starting the course with an icebreaker is also not least. Icebreakers are very effective in keeping students motivated in remote learning. According to Wishart (2021), the purpose of icebreakers is to energize and engage the team.

Using virtual icebreakers e.g. "two truths and a lie," "would you rather be...," etc. is a great way of overcoming one of the biggest challenges of managing remote teams because they help in bringing the team together and strengthening your bond as remote teammates (Mind Tools, n.d., Duff, 2020, Dhami, 2021). Teachers use icebreakers to get opportunities to engage with students and increase meaningful engagement with the course content (University of Waterloo, n.d.) while in synchronous and asynchronous classes.

Another way is the use of a discussion board. Interactive discussion boards have enhanced student performance and positive attitudes in online learning and students who read their colleagues' postings consistently get higher grades (Education Services, 2020, Hennington, 2020). According to Gernsbacher quoted by Foster (2016), the teachers direct students on what their answers should look like in a discussion board. Students do not simply post "I agree" comments. They need to follow Gernsbacher's 3C-Q model. This consists of starting with a compliment (e.g. I like that …), then continuing with a comment (I agree with that …), extending it with a connection (e.g. I also thought that …), and finally asking a question to extend the discussion (e.g. I wonder why …). This kind of posting increases student motivation and engagement as they interact with each other.

Students engage with learning when they are asked questions that require deep thinking than being asked simple factual or memory questions (Bender, n.d.). Teachers are encouraged to use simulations, reality-based scenarios to cultivate higher-level thinking skills (Hennington, 2020). Harris (2020) argues that higher order thinking questions help students explore and express rigor in their application of knowledge. Among the 5 areas of higher order thinking that promote rigor there is engagement that shows the presence of all student minds hard at work. Asking higher order thinking questions enhances student engagement which is the degree of motivation that students demonstrate while they are learning.

Peer review has been used as an engaging strategy that helps students to evaluate their projects and strengthen their learning and meta-cognition (Mirmotahari, Berg, Fremstad, and Damsa, 2019). This strategy is more exciting as students are able to give feedback to their peers. As student projects are evaluated by students themselves, this kind of peer assessment "encourages students to develop analytical skills and critical evaluation" (Stepanyan, Mather, Jones, and Lusuardi, 2009). This strategy is easy for the institutions that use canvas as a learning management system where students can be given peers to review. As students evaluate

their peers, they develop insights, and the strategy contributes to students' learning.

Parents are partners in education. The best tip for school success is to make sure that parents and teachers are working together as allies (Morin, 2021). In remote learning, parents have to play an active role in the learning of their children (Lebaste, 2020, Novianti and Garcia, 2020). The authors argue that teachers and parents should work together to ensure that their children engage with the content and learn excellently, and that they receive quality education without compromising their safety. Parents and teachers should be in regular touch. Communicating with parents as early as possible is a key for student engagement because they also become active participants in their children's learning. Great teachers make the parents their allies in students learning (Campen, 2020). Teachers should advise parents about different means they can use to keep their children engaged and focused while learning from home.

Teachers also refer to reflections to attract the students' attention and retention of information. Class final reflection involves "a process where students describe their learning; how it changed, and how it might relate to future learning experience" (Purdue University, 2021). At the end of each session, students make summaries of the content. They tell what went well and what needs to be improved. This is because having students discuss the summary in partners for the last five minutes of class will increase memory for the content (Bender, n.d.). Recurring reflection activities encourage students to think critically about their writing

practices and to make sense of the contents, and reimagine their experiences for future benefit (Dyment and O'Connell, 2011).

III. RESEARCH METHODOLOGY

3.1. Research design

This study uses a survey design and mixed methods in data analysis. According to Creswell (2014) mixed methods involve using both qualitative and quantitative research study and the mixed methods were appropriate given the nature of the study. In the study, purposive sampling was used in choosing only the instructors who taught during the module sessions mentioned above and students who took modules in module sessions and the population comprised both students and instructors at Kepler. The total population of students is 316 students who were active in the period of May to November 2021 and the total number of instructors is 25. Using Slovin's formula, the sample size was 174 and 25 for students and instructors respectively. To collect the data, there was one data collection instrument which was a questionnaire in the nature of a Google Form. This questionnaire was structured to collect both quantitative and qualitative data. The data collected was analyzed using tables, graphs and charts.

3.2. Data Presentation

This section presents data, and analyzes the findings obtained in the current study related to challenges faced and strategies used in order to engage students in online learning.

Table 1: Research Instrument Return Rate

Types of instruments	Number administered	Number returned	% of returned rate
Students' questionnaire	174	169	97%
Instructor's questionnaires	25	18	72%

Source: Research, 2021

Table 1 shows the return rate of the questionnaire. In fact, the return rate percentage is 97% for student questionnaires and 72% for teacher questionnaires. One of the reasons why the return rate for teachers is lower compared to students' return rate is heavy workloads of the teachers during the aftermath of the pandemic. Issues related to the internet, home duties and responsibilities, depression and technical issues are also some of the reasons why 28% of the instructors could not respond to the online survey. Nonetheless, the average return rate from all respondents

is still over 70% and this allowed the researchers to put hands on the data because the response rate is sufficient to make the research results valid and reliable (Morton, Bandar, Robinson, and Carr, 2012).

Demographic information

This study involves students and teachers in both the foundation and module programs. We collected demographic information about students' age and cohorts as well as instructors' experience in teaching at Kepler.

Table 2: Students' age and cohorts

Construct	Category	Percentage
Age	15 - 20 years	26.6%
	21- 25 years	63.9%
	26 years and above	9.5%
Cohorts	2017	
	2018	18.9%
	2019a	10.1%
	2019b	18.9%
	2021a	51.5%

The majority of students involved in this study are aged between 21 and 25 (63.9%). 26.6% are aged between 15 and 20 years, while only 9.5% are aged above 25 years.

The study involved students in different cohorts. Those who participated are those who attended class during the unprecedented time of the covid-19 pandemic (i.e. Module session 4 and 5 as well as those on the Foundation Program. 51.5% are from cohort 2021a, 18.9% are from cohort 2019b. The same percentage (18.9% are from cohort 2018, whereas 10.1% are from cohort 2019a. A small portion (0.6%) was from the older cohort of 2017.

The above table displays that the majority of our students were between 21 and 25, which is the age range where the majority of our newly recruited and most active students who are attending the bulk of modules and Foundation Program fall. Most of the time, older students tend to be focused on looking for job opportunities and scarcely reach the campus. This can also be the reason why we have a big number of students from cohort 2021a.

Table 3: Teacher's experience

Teacher's experience	Number	Percentage
Less than 1 year	4	22.2%
Between 1- 5 years	12	66.7%
More than 5 years	2	11.1%

Most instructors who participated in this research have 1 to 5 years of experience at Kepler (66.7%). 11.1% have more than 5 years while 22.2% have less than 1 year. It is clearly seen that 77.8% are of more than 1-year experience.

The table shows that the bulk of Kepler staff is young (more than 88% are less than 5 years of experience. This has been beneficial in terms of adapting to new policies and technologies because the young staff showed quick learning.

Challenges Kepler instructors faced while shifting to learning remotely

This section focuses on the challenges faced by instructors while working remotely, and depicts the challenging situation they passed through that required them to look for different ways liable to help them to keep on working and performing at their best. The figure below shows some of the challenges.
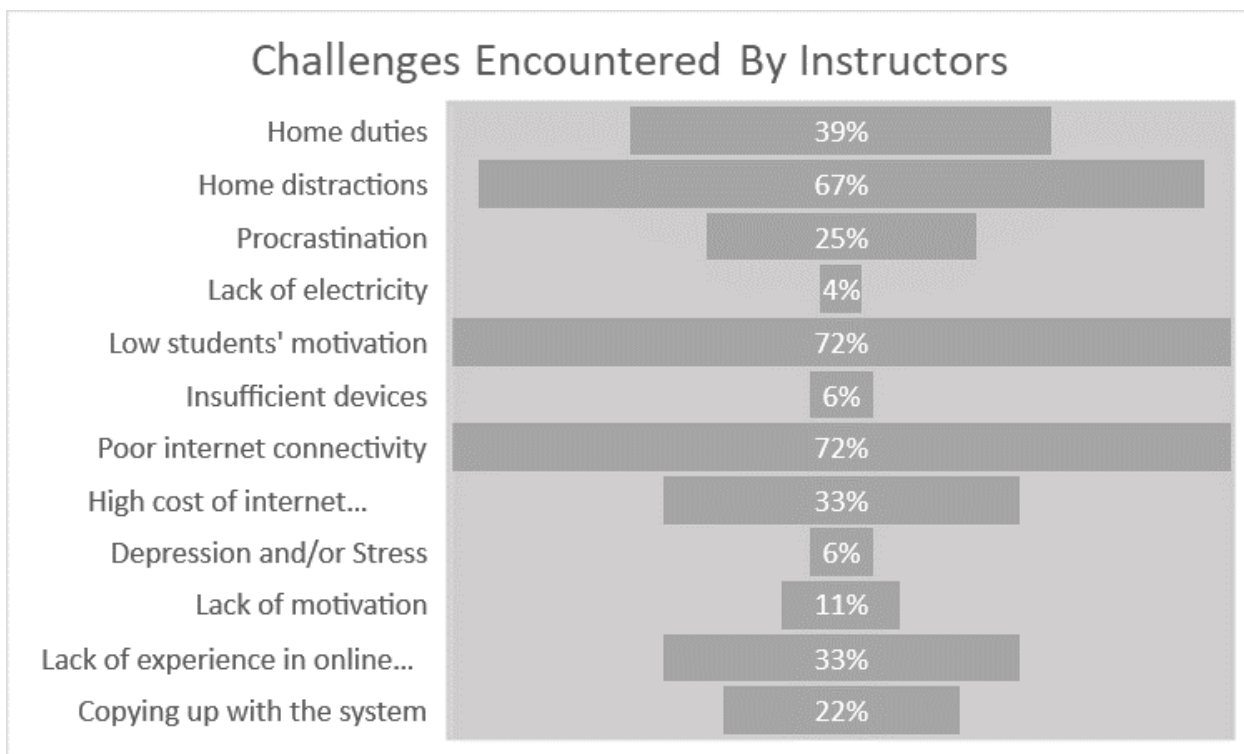
Challenges Encountered By Instructors

Challenge	Percentage
Home duties	39%
Home distractions	67%
Procrastination	25%
Lack of electricity	4%
Low students' motivation	72%
Insufficient devices	6%
Poor internet connectivity	72%
High cost of internet…	33%
Depression and/or Stress	6%
Lack of motivation	11%
Lack of experience in online…	33%
Copying up with the system	22%

Fig.1: Challenges Kepler instructors faced while shifting to teaching remotely

Figure 1 displays that poor internet connection and low student motivation are the most faced challenges (72%) because all households could not afford strong internet connection ((Ubaid, 2018). This reduced staff engagement as well Chipchase et al. (2017) as they faced distress and they couldn't face colleagues to interact with like they used to in face-to-face learning. These are followed by home distractions (67%) as well as home duties (39%) as mentioned by (Lomov, 2020, Scott, 2016). Also, instructors were affected at some extent by lack of experience in online teaching (33%), high cost of internet (33%), unconducive study environment (27%), procrastinating tasks (22%) lack of electricity (22%) as well as copying up with the system (22%).

Challenges Kepler students faced while shifting to learning remotely

Kepler students faced a smorgasbord of challenges while working online. The following figure presents some of those challenges.
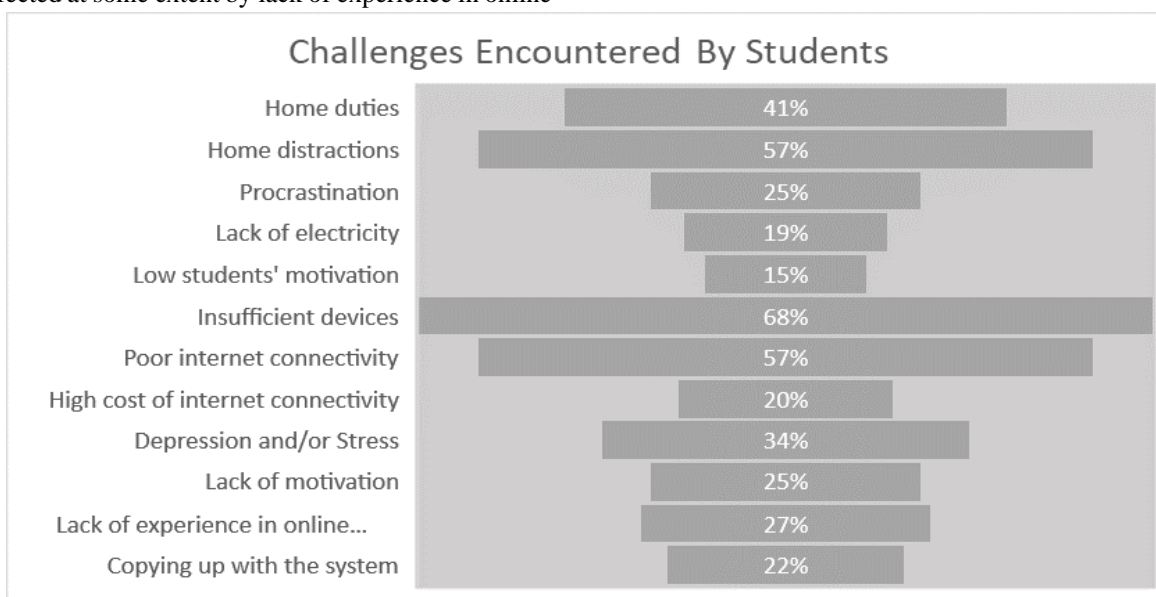
Challenges Encountered By Students

Challenge	Percentage
Home duties	41%
Home distractions	57%
Procrastination	25%
Lack of electricity	19%
Low students' motivation	15%
Insufficient devices	68%
Poor internet connectivity	57%
High cost of internet connectivity	20%
Depression and/or Stress	34%
Lack of motivation	25%
Lack of experience in online…	27%
Copying up with the system	22%

Fig.2: Challenges Kepler students faced while shifting to learning remotely

Like the instructors, students faced a number of challenges as Figure 2 shows. The first challenge is insufficient devices to use such as computers, tablets or internet enabled phones (68%) This is followed by unavoidable home distractions and poor internet connectivity both at 57%. This could be explained by the fact that students were living in their homes with their family and this affected their learning. Additionally, in most homes, there is on internet connectivity. All these could lead to low student performance if the institutions could not devise proper ways. However, factors like lack of electricity (19%) and low motivation (19%) didn't contribute much to the teaching and learning process during the pandemic as the data in the table tells us.

The respondents reported that internet connectivity, high cost of internet and human distractions are the main challenges that they faced. In fact, at the beginning of this program, students had no money to buy bundles on their own as, with their stipend, they could not afford it. In addition, as mentioned above, it was quite difficult for some students to get connected in some areas. In addition, when working from home, students would be assigned some household chores that would hinder them from accomplishing academic related tasks. This prevented them from being focused as many other distractions were surrounding them.

Strategies used for keeping student engagement

The researchers wanted to know strategies that instructors used to keep students engaged to mitigate the challenges of teaching and learning in an online environment as well as strategies that students attest to have kept them engaged. Table 4 shows the strategies that instructors used to keep students engaged and strategies that students felt engaged them.

Table 4: Strategies used for keeping student engagement

Strategy	Instructors	Students
Discussion board	94.40%	69.80%
Giving and receiving feedback	72.20%	61%
Self-paced quizzes	61.10%	52.10%
Videos and podcasts	44.40%	53.30%
Icebreakers	66.70%	48.50%
Google doc	52%	47.10%
Peer reviews	39.90%	35.90%
Class final reflection	44.40%	37.30%
Warm up prompts	55.60%	36.10%
Vocaroo & SpeakPipe record	44.40%	39.10%
Canvas media record	27.80%	26.60%
Higher order questions	44.40%	21.90%
Jigsaw online activities	16.70%	10.10%
Jigsaw	16.70%	10.10%
Higher order questions	40.40%	21.90%

From the data in the table above, both instructors and students reported that the strategy that helped to engage the students is the use of discussion boards created in the learning management system (94.4% vs 69.8o%), followed by giving and receiving feedback (72.29% vs 61%) and the use of self-paced quizzes (61.10% vs 52.10). The data show us that online jigsaw activities were the least used (16%). Students were not very engaged with the use of online jigsaw activities (10%). This tells that the complexity in using the strategy, and the familiarity with the strategy determined what strategies instructors used. In addition, students also preferred the use of videos and podcasts in online classes (53%). Briefly, this set of data tells us that students were mostly engaged with strategies that most instructors used. This can be attributed to the fact that instructors tended to use strategies that are less complex and that students are familiar with such as quizzes (Urtel et al., 2006, Hughes, Salomonson and Metcalfe, 2020, Ross, Chase, Robbie, Oates and Absalom, 2018, Schmidt, Sanchez and Dickerson, 2017). Using online icebreakers

was also a crucial strategy to engage and energize the students (Dhami, 2021, Wishart. 2021, Duff, 2020). Icebreakers are one of the strategies that students loved (48.50%). Videos and podcasts also played a big role (Richard and Costello, 2020, Harris, 2020, Riley, 2019). Peer reviews are also of paramount importance as different researchers pointed it out (Priyadarshan et al., 2015).

Students and instructors agreed on this at 35 and 39 percent respectively.

Impact of the strategies used during online learning

The figure below shows students rating on the impact of strategies used during online learning.
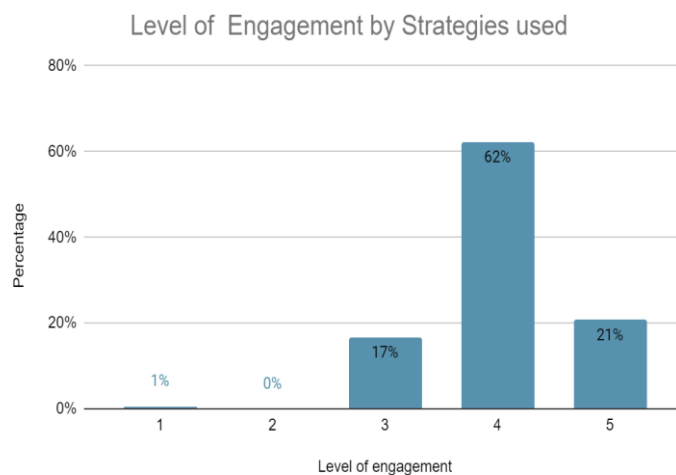
Fig.3: Student level of engagement

Figure 3 shows how the tools and strategies used during online learning helped students to stay engaged. The general picture is that the strategies used helped students stay engaged but on varying levels. 35 students (20.7%) responded that they are highly engaged (scale of 5). Most of the respondents (105 that represents 62.1%) responded that they were very engaged (scale of 4) and 28 respondents (16%) responded that they were engaged. None of the respondents ranked their engagement to a 1 or a 2. This can explain that instructors were effective in choosing the strategies to keep students engaged. The reason behind this choice is that the instructors had received professional development training right after Covid 19 was declared a pandemic. In addition, the instructors revised teaching materials and online learning tools to include engaging activities. Instructors combined videos and audio tools as well as regular class reflections. Peer tutoring, peer reviews and reciprocal feedback also contributed to student engagement.

The tools and strategies used were impactful to students' learning as 82.9% of the students reported that the tools and strategies helped them stay engaged, ranking them between 4 (62.1%) and 5 (20.7%).

IV. DISCUSSION

Challenges derived from teaching and learning online and ways to mitigate them

The issues of internet connectivity and low motivation amongst students, in addition to home distractions, are the ones that mostly interfered with students' learning (Lemov, 2020, Scott, 2016). The teaching and learning activities could have stopped if Kepler hadn't provided enough internet bundles to students and teachers. The institution provided devices to students and requested those in low connected locations to shift to places where internet connection was stronger. The learning management system and learning materials were also adapted to fit the online requirements. To tackle the issue of low motivation, instructors had to intensify icebreakers that were used at the beginning of the lesson session (Dhami, 2021). Students could also discuss class activities via the use of interactive discussion boards and peer reviews sessions (Mirmotahari, Berg, Fremstad, and Damsa, 2019). The instructors also proceeded by the use of online podcasts and videos to maintain students' enthusiasm (Richard and Costello, 2020, Harris, 2020, Riley, 2019). Extra Supporting systems such as office hours and intervention sessions were also put in place in order to support students who had struggled to accomplish their tasks due to different challenges they faced.

While responding to the question about the impact of the tools and strategies (*How do you think the tools and strategies used impacted your online engagement?*), the students reported that the tools and strategies used during online learning created motivation and increased their engagement and were able to learn from each other while

commenting in google documents, discussion boards and doing peer reviews. They learned new technology tools that helped them stay focused and increased team work. Most of them wrote that the tools opened their minds and increased their problem-solving capabilities. They increased students' level of planning, prioritization, reflection, organization, and asking clarifying and probing questions. Students were able to interact with colleagues while discussing online, and the tools used made the classes interactive and interesting. The level of innovation also increased. Quizzes and discussion boards boosted students' level of thinking, and they obtained a variety of thoughts and points of view. This is in line with Hennington (2020) beliefs on the use of online quizzes.

Teachers' Perceptions on the Impact of the Tools and Strategies Used

The instructors shared that the tools such as the adapted learning management system, discussion boards, online podcasts and videos helped in delivering the content and keeping the students focused (Barnwell, 2021, Brame, 2005). They reported that the online tools used boosted students' accountability and active participation during class (Ubaid, 2018), and students were able to communicate with the teacher whenever they faced any challenge. Using the tools helped the students to continue and complete their learning during the unprecedented moment of the covid-19 pandemic. Students' participation was high, and they were able to develop their critical thinking (Matthew, 2019). The tools helped to raise students' motivation and teamwork. Instructors were able to achieve the learning outcomes and ensure students' engagement. Nonetheless, instructors referred to different tools and strategies to mitigate issues related to students' disengagement notwithstanding home duties and distractions, internet issues, and troubles related to the new system. Kepler handled the issue of devices and internet bundles to make sure that students and instructors are well equipped.

V. CONCLUSION AND RECOMMENDATION

4.1. Conclusion

Covid-19 has been well and truly challenging and affected all aspects of life. This study discussed the challenges faced, the strategies to overcome those challenges, and the impact those strategies had on students' engagement and performance. As far as challenges are concerned, the bulk of them that most respondents (both teachers and students) highlighted were related to the slow internet connection due to some weak devices that both teachers and students were using, or the place in which they were located. In addition, both respondents asserted that teaching online consumes much internet bundles, and therefore, they were obliged to

use their own money beside the communication allowance that Kepler had offered to them. Distraction and household duties were also other challenges that both instructors and students mentioned and this prevented them from being concentrated and completing their tasks on time. Students also said that they were demotivated because of working alone as they were used to working in teams and getting direct support from their peers and instructors.

To face those challenges, Kepler instructors innovated some strategies that kept students engaged despite the challenges mentioned above. Some of these strategies that they have used and were successful included emphasizing discussion boards on the learning management system where students interact with each other, giving and receiving feedback from instructors and peers, self-paced quizzes, videos and podcasts and the use of icebreakers. From the data presented, these introduced strategies were impactful as far as student engagement is concerned because all students who responded to the survey agreed that they had been engaged by the tools and strategies introduced by their instructors.

4.2. Recommendation

While learning online, students face a lot of challenges. The main challenges are those related to internet connectivity, devices, and home distractions. To cope up with new challenges, institutions conducted deeper research to find ways to support students, and invested a lot in providing new devices to students and sufficient resources including internet bundles. Training the staff and students about mental and physical healthcare also helps in reducing the issues related to anxiety and depression while coping up with the new system. Tools such as videos, podcasts, and online platforms help a lot in keeping students engaged. Strategies such as discussion boards, peer reviews, asking higher order thinking questions, as well as class final reflections were used for keeping student engagement. Thus, the institutions that are not yet working in a blended model should reset their courses in a way that would facilitate online or remote transfer of contents in case we again face unprecedented moments like the one we faced during the covid-19 time.

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