



## Factors Influencing Orderly Transition to Online Deliveries during COVID19 Pandemic Impact

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author CJ designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors UW and HK managed the data collection and analyses of the study. Author GS managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

With the spread of COVID 19, almost every higher educational entity initiated online delivery whereby teaching is undertaken remotely on digital platform. A massive shift like this arises an onslaught of questions. A case study was conducted in March and April 2020 to determine the challenges affecting the adoption of e-learning in 6 university colleges in Sri Lanka. A comprehensive literature survey was carried out. A questionnaire survey was administered to 90 teachers and 650 students and analyzed through the use of simple descriptive statistics. Besides, a narrative analysis was undertaken to identify shared views expressed in a series of telephonic inquiries. It was found that data as it is a survey based paper. The paper concludes with some solutions implementable in three stages. The findings of the study will help work out a digital policy, revisit the existing educational taxonomies and enhance the effectiveness of online delivery particularly in a future context similar to COVID 19.

**Keywords:** COVID19; e-learning; University education.

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## 1. INTRODUCTION

Fulfilling a long-felt need, the University Colleges in Sri Lanka were established in 2014 and operate under the purview of the University of Vocational Technology in Sri Lanka (UoVT). The University Colleges (UCs) conduct National Vocational Qualification 5 and 6 level courses leading to a diploma-level certificate. UCs are given authority to admit students, hold examinations, and determine with the approval of the UoVT degrees, diplomas, certificates, and any other academic distinctions to be awarded. There are 6 UCs conducting courses in at least 7 professional disciplines namely, Construction Technology, Quantity Surveying, Food Technology, Farm machinery, Electrical Technology, Event management and Tour and Hospitality Management. The total student population is nearly 3500.

With the spread of COVID 19 in Sri Lanka, the government extended nationwide curfew to control people mobility. Few towns had to be locked down. All the UCs were closed down. E-learning became the rubric for all academics and students. A work-home-plan was implemented despite its practical limitations. Online studies during pandemic became a novel experience even though access of digital platform had been free. However, to understand the success of online education in a pandemic situation, it is essential to gain a holistic picture of the issues surrounding. This study addresses this knowledge gap particularly when the lectures and students alike suddenly navigate online deliveries without any prior formal planning, training or otherwise. This paper presents the findings of a case study of the University Colleges in Sri Lanka during their pursuit of online deliveries.

## 2. LITERATURE REVIEW

E-learning is the delivery of content via all electronic media, including the internet, intranets, extranets, satellite broadcast, audio/video, interactive TV and CD ROM [1]. E-discussion boards, forums and wikis enable collaborative learning to develop teamwork skills [2]. E-learning is electronically mediated asynchronous and synchronous communication [3,4]. E-learning is a natural evolution of distance learning, advantaged by the latest tools to emerge in the context of technologies for structuring education [5].

E-learning adds the benefit of encouraging learners to build self-knowledge and self-confidence. The use of e-learning can promote collaborative, active and lifelong learning, increase students' motivation, offer better access to information and shared working resources, deepen understanding, help students think and communicate creatively [6]. The benefits of e-learning include cost efficiency, accessibility and flexibility in terms of time and place. E-learning allows learning to take place when the lecturer and the learner are separated both in time and space [7]. However, e-learning brings ease of access to information, the potential for interactivity amongst and between learners and teachers, enables the conduct of lessons from a remote location and extends geographical access to education [8]. There has been tremendous growth in online education during the past decade as access to the Internet and the World Wide Web has continued to propagate [9]. The literature on online delivery in the field of education has numerous terms such as distance learning, computer-based remote learning, distributed learning and online learning. Even though it is in variety of terms, the function and outcome are communal [10].

A common feature for learning in usual classroom environment is the social and communicative interactions between student and teacher [11]. Effectiveness in online learning is high at least it is equivalent to the traditional learning method like face-to-face learning [12]. In general, there are three kinds of interactivity that affect online learning as interaction with content, interaction with instructors and interaction among peers [13]. Later, new interaction was identified due to emerging new technologies. It is called by means of learner-interface interaction that used to mediate a particular distance education process, engaged the place between student and technology [14]. In online education, an interface is an internet and World Wide Web. The success in online education, these four factors should be interacted properly [12]. Several studies have suggested various issues regarding these four factors [15]. For example, attitudes of instructors are a major issue affecting in online education [16]. In addition to that, the accessibility of the interface and flexibility of the online delivery method are one of the challenges of online education [17,18].

There are numerous challenges to embrace e-learning in universities. The real challenge is training for changes to pedagogy [19].

E-learning's success rests on the fundamental requirement that instructors and students possess adequate technical skills to use e-learning tools effectively [20]. Due to space restriction, Table 1 offers findings of 50 scholars in terms of the way they perceive online deliveries as a collection of challenges.

**Table 1. Findings of the literature survey**

#	Source	Challenges	Remedial Measures
1	[21]	Academics who are not equipped technically to handle developments of materials and delivering online modules are hampering the progress	Extensive skills development
2	[22]	Issues in e-learning pedagogy	The material should be in learning objects; independent classroom sessions comprising small instructions and independent on other learning objects. Appropriate tests should be incorporated
3	[23]	Issues in identification and understanding the learning styles of online students when they cannot be visualized, especially when they have limited time and many students enrolled	Communicate with non-participants privately to encourage discussion
4	[24]	High costs associated with some applications of the digital technologies	Substitute some online provision for on-campus teaching (rather than duplicating it), facilitate increased peer/automated learning, use of standard/pre-existing software, increase material re-use and sharing
5	[25]	Technology, behavioral characteristics of learners and instructor's teaching style as critical challenges.	More investment needed
6	[26]	Lack of leadership and support from senior management	Head teachers need to be involved in decision making
7	[27]	The nonexistence of infrastructure, along with connectivity	More investment of resources especially at the initial stages
8	[28]	Quality of the internet	More investment needed
9	[29]	Enhancing teachers' ability to integrate technology into teaching and learning	Develop approaches / teaching techniques
10	[30]	Cultural and linguistic background of students and instructors, and their awareness of and attitudes towards e-learning; the underdeveloped technological infrastructure; lack of local expertise in curriculum development for e-learning	Educational management mechanisms to support e-learning initiatives
11	[31]	Lack of electricity, awareness and training of staff on the use of ICTs, motivation, bandwidth and internet connectivity	More investment needed
12	[32]	Technological fluency among the academics	Adequate training to utilize pedagogy in the e-learning environment
13	[33]	The complexity of learner's participation	Enhance participation by mixing audio or video discussion with online text discussions

#	Source	Challenges	Remedial Measures
14	[34]	Instructor and student support, content of the lecture and how the institute evaluates online learning	Micro-level intervention with IT support
15	[35,36]	Much work needs to be done related to the costs of the digital technologies' implementation in education environments	Investigate the costs of e-learning before the investment.
16	[37]	Students face difficulties in time management and lack of institutional support during learning and encountering technological problems	Improve interaction/better feedback by instructors, improved technology, better course organization, more technical training and support and adding live component
17	[38]	Many of the distance teaching providers, particularly those which are based on the industrial model, face more challenging tasks in their attempts to incorporate the digital technologies into their systems due to the conceptual framework of their operation.	Redefine the underlying premises of the distributed teaching responsibility embedded in the industrial model
18	[39]	Some applications might be terribly costly (such as a pre-prepared multi-media program).	Some of the digital technologies can be used with minor alterations of the study environment, while others require a grand change and a total overhaul of the existing infrastructures.
19	[40]	On line education either traditional or social network learning is at an early unroutinized development stage	Informal initiatives have yet to be turned into formal procedures
20	[41]	The challenge is to promote growth and improve learning experiences and outcomes.	'Catch' disruptive waves: MOOCs (Massive Online Open Courses) attracted attention and pointed to alternative ways of thinking and acting for learning design and reaching new students
21	[42]	Instructors face the issue of lack of empowerment	Online instructors are encouraged to engage in designing the content and adopting an autonomous and active role
22	[43]	Copyright issues in preparing rich study materials	(no solution provided)
24	[44]	Lack of incentives in designing and delivering online courses	Offering appropriate incentives
25	[45]	Learners' readiness is low. Not all learners can successfully participate in online courses.	Self- directed learning, motivation for learning, computer and Internet self-efficacy, and learner control
26	[46]	Technical errors, bugs, slowness	Technology should be used effectively in return of the investment
27	[47]	Lack of encouragement to the students for online technology.	online learning with practice examples
28	[48]	Ineffective teaching style.	use various e-learning methods and strategies, such as dynamic presentations, laboratory tutorials, simulations, conceptual discussions, interaction and collaboration with students to support their activity, exploration, and knowledge development

#	Source	Challenges	Remedial Measures
29	[49]	Online teaching reported, a need some more time teaching rather than face-to-face mode.	Adequate professional development is necessary, including effective course design, instruction, implementation, and evaluation.
30	[50]	Learners are isolated and disconnected	Introduce technical, political, structural, cultural, and personal dramaturgical or performance.
31	[17,51]	Learners' expectations can be challenging	Communicate course rules and policies at the beginning
32	[52]	Time management issues when answering queries, preparing lecture notes	improving how academics can balance their workload. A compensation system or clarity in pay required.
33	[53]	Difficulties in instructing learners	Peer-to-peer interaction, active student engagement in learning, emphasis on practice and student effort, personalization to the individual student, variety, and emphasis on higher thought processes.
34	[54]	Lack of learner-centered contents and strategies	Use a combination of collaborative activities, reflective activities, clear assessment criteria, and integration of technology
35	[55]	Identified assessment of students is a major issue in online education.	Enough gap in timing
36	[56]	cultural and linguistic background of students and instructors, and their awareness of and attitudes towards e-learning; the underdeveloped technological infrastructure and the often prohibitive cost of educational technologies; the lack of local expertise in curriculum development for e-learning; and, the lack of educational management mechanisms to support e-learning initiatives	(solution not suggested)
37	[57]	Cost of setting up the necessary infrastructure remains prohibitive in developing countries; a dearth of appropriately skilled technical support staff is challenging.	Concurrent development of human resources and infrastructure development is required for effective utilization.
38	[15]	Student characteristics such as intelligence, motivation, and computer experience are crucial to the success of online learning.	Training for students.
39	[58]	Instructor's inability to communicate, form community, and deliver the appropriate lesson effectively makes all the difference in student learning outcomes.	Establishing a relationship and the ability to connect with students and help them to feel as a part of the class.
40	[59]	Less learner control in online education.	Manipulations that trigger learner activity or learner reflection and self-monitoring
41	[10]	Instructor's lack of familiarity with technology	Enhance good control of technology and ability to perform basic troubleshooting tasks via training

#	Source	Challenges	Remedial Measures
42	[60]	Academics that use e-learning systems face difficulties in managing their time	Academics should always maintain a vigorous presence on online discussion boards so they control discussion, provide answers and feedback
43	[61]	Establishment and growth of effective social interaction is challenging.	Timely feedback, monitoring group dynamics, inviting students to seek help, expressions of emotion and empathy and contacting non-participants.
44	[62]	Training for changes to pedagogy	learning to use platforms
45	[31]	Difficulty in extracting the ideas from audio video discussions	Provide elaborations on text postings
46	[63]	Several registered e-learners have been reported unsuccessful to complete their degrees.	Involve teaching assistance during the online lecture. It influences the increase in mean scores of all learning styles.
47	[64]	One of the primary challenges in online education is to develop a sense of community in the online environment.	Both learners and instructors have to make a joint effort to get deeply involved in constructing interaction and collaboration
48	[65]	Lack of new modes of teaching and learning	Allocate special and generous funds to enhance collaboration for the benefit of a large audience of teachers.
49	[66]	The new technologies require the academic faculty to assume new responsibilities and to develop a range of new skills.	Diverse digital environments should be created in the universities where academics can experiment with technology enhanced learning tools and discuss the pedagogy underpinning their uses, in order to be able to facilitate student engagement
50	[67]	Most teachers and professors do not possess sufficient digital literacy and do not utilize the wide range of capabilities	Equip teachers with tools to use the wide range of capabilities, well-designed training, and ongoing support systems

## 2.1 Research Aim and Objectives

The research aim is to offer key insights into formulating a digital strategy for degree level online deliveries in universities. The objectives are

- (i) To reveal the characteristics of online learning
- (ii) Rank challenges affecting the adoption and utilization of e-learning in the order of criticality (seriousness)
- (iii) Reveal the potential measures taken to remedy the issues in connection with online delivery and ease out traversing online mode of education in a situation where the university physical functions have been almost at a stalemate with curfew and lockdowns.

## 2.2 Originality

This study thoroughly considered the findings of over 50 referred research journal papers in pursuit of the latest body of knowledge on online delivery methods in the university circle. Surprisingly, none of these researches have been pertaining about the challenges encountered in an orderly transition from traditional in class mode of delivery to distant online mode of delivery. This may be apparently because the lockdown and curfew with the spread of COVID19 is the first time experience where the entire university system had no option other than simply stepping into online deliveries with no prior planning. Hence, this study is the first of its kind considering the context in which the study is undertaken.

### 2.3 Significance of the Research

COVID 19 forced the educators to revolutionize the way they teach, moving from a lecture-listen model to an interactive, learn-by-doing model. As such, the issue is how well it could be suited to capture the wave. This paper addresses the foregoing issues concerning university colleges where there is no previous acquaintance with the delivery of courses online. The study involved gathering information from key e-learning stakeholders about their experience on what challenges they face in implementing the mode of e-learning with a future direction.

### 2.4 Research Methodology

This study used a descriptive survey methodology. It was conducted between March and April 2020. Primary data were collected using questionnaires and in-depth interviews. Two separate structured questionnaires were designed and self-administered to teachers in all the UCs and students in selected departments. In the questionnaires, students and teachers were provided with a list of challenges likely to reduce the efficacy of e-learning.

They were required to rank the challenges in the order of seriousness they truly experience. Opinions expressed via email were analyzed to capture the challenges facing e-learning. Sampling evolved the selection of lecturers and students who were the main respondents of this study. 120 teachers of the UCs and 650 students from UCs were invited in this survey. The total number of respondents followed by the percentage is 85% (102 teachers) and 64% (416 students) respectively in the case of teachers and students. Collected data were coded and the responses from the questionnaires using 5 point Likert scale were arranged and grouped. The data were then entered into the appropriate categories in computer worksheets using Microsoft Excel. The results were summarily presented in Tables that give the mean value the UCs gained.

Besides, a series of telephonic interview was subsequently conducted focusing mainly on university administrators and senior academics including all Chief Executive Officers of the University Colleges. Through the interviews, additional insights into the challenges affecting the adoption of e-learning were collected.

Accordingly, 32 interviews were purposely selected in this empirical study. This sample size is enough to establish the credibility of this research. Qualitative inquiry should typically focus on relativity [68]. As such, there are no strict rules for sample size in qualitative inquiry [68]. A narrative analysis was conducted to derive the final standpoint.

### 3. FINDINGS AND DISCUSSION

With the government's directive requiring educational entities to faster adopt e-learning, the university colleges have now stepped into this mode of delivery despite practical limitations. The overall finding suggests that the attitude is optimistic. However, it could be noted that no one has prior experience in using e-learning system for teaching purposes but a few had accessed it for their learning activities. Those who have basic IT skill and those participated in training workshops are confident enough in embracing the system, but those with poor IT competency opt to slowly adapt. Table 2 shows the individual rank as well as the average rank earned by each university college against 17 challenges specifically encountered as a result of curfew and lockdowns.

Teachers ranked that in online without being blended with prior face to face learning is the most serious challenge impeding the adoption of e-learning. The teachers find that, data and Wi-Fi access is not available to all. Meanwhile, insufficient internet capacity and low and disturbing internet connectivity exacerbate the problem. Inadequate capacity to attend to the large number of students on the internet is again a problem. Teachers are of the view that online has limited use in mathematics, science and technology-related modules.

Students ranked thirteen challenges that were deemed likely to affect their adoption of e-learning. These challenges, some of which are similar to the ones ranked by teachers, included insufficient internet connectivity, limited computer skills, lack of computers/laptops and inadequate time to interact with their teachers and fellow students online. Students who have been disadvantaged by the lack of electricity have been the most vulnerable. Both the teachers and students had a concern regarding the weather conditions such as thundering during the monsoon period that interrupts online access.

**Table 2. Ranking of e learning challenges by teachers during curfew/lockdown (5 being the most critical)**

#	Challenges	UCA	UCB	UCJ	UCK	UCM	UCR	Average rank
1	No data purchasable/wifi access to all	5	4	4	5	4	4	4.3
2	Insufficient Internet capacity	4	3	3	4	3	4	3.5
3	Low/disturbing Internet connectivity	4	4	5	5	5	3	4.3
5	Inadequate time for module development	4	3	3	3	4	3	3.3
6	Lack of computers/laptops	1	1	1	1	1	1	1
7	Limited ICT skills/tools/no prior training	2	2	1	1	3	2	1.8
8	Heavy workload	1	1	1	1	1	1	1
10	Not all practicals are possible	5	5	5	5	5	5	5
11	Assignments submitted are not reliable	2	3	3	3	2	2	2.5
12	Inadequate capacity to attend to large number of students on the internet	4	5	4	4	5	4	4.3
13	Online notifications may not be seen by all	4	5	5	4	4	5	4.5
14	Not suitable for all the modules (maths, science and technology have limited use)	4	5	5	5	5	5	4.8
15	Not effective without being blended with prior face to face learning	5	5	5	5	5	5	5
16	Electricity not available/no facility to charge batteries/phones	2	2	1	2	2	1	1.7
17	No repair outlets available during curfew/lockdown	4	4	3	3	4	3	3.5

(UCA: University College of Anuradhapura, UCB: University College of Batangala, UCJ: University College of Jaffna, UCK: University College of Kuliypitiya, UCM University College of Matara, UCR University College of Ratmalana)

### 3.1 Narrative Analysis

Narrative analysis is whereby the researcher engages in an inquiry of asking a given question of the narrative 'texts' for a given purpose [69]. This approach offers an understanding as to how people are representing each other. There is typically a greater amount of inductive reasoning though overall in narrative inquiry. The theoretical underpinning of narrative inquiry is the process of telling the narrative is believed to have the potential to transform the participant's experiences [70].

As such, the findings of the literature survey and the questionnaire survey became a nucleus for

subsequent high tier interview that took the mode of a less structured manner encouraging an open dialogue. Hence, the findings so far with teachers were re-read to generate questions related to different parts of the interview. 32 individual senior academics were asked to elaborate their experiences that are viewed as pertinent. Memos were written down while interviewing and the conclusions were drawn upon with regard to Concept, Context, Content, Adaptation, Approach, Digital divide, Tools, Work load, Assessment, Process and Recommendations. They were precursor to their impression that the online delivery is challenging. Table 4 depicts the approach taken to undertake the narrative analysis.



According to the academics, the context (in which the online deliveries are made) itself is complicating the phenomena. This complexity, according to the academics, is mainly because of the inability to organize well in advance of the COVID 19. Table 5 offers shared viewpoint as a result of the narrative analysis.

**Table 3. Ranking of e learning challenges by students during curfew/lockdown (5 being the most critical)**

#	Challenges	UCA	UCB	UCJ	UCK	UCM	UCR	Average Rank
1	No data purchasable/wifi access	5	4	5	4	4	4	3.6
2	Insufficient Internet capacity	4	4	4	4	4	4	4
3	Low/disturbing Internet connectivity	4	4	4	4	4	4	4
4	Inadequate time for submitting assignments/quizzes etc	2	3	3	2	2	3	2.5
5	Lack of computers/laptops	3	4	5	4	5	5	4.3
6	Limited ICT skills/tools/no prior training	3	5	4	5	4	3	4
7	Heavy workload	2	2	2	2	2	2	2
8	Inadequate opportunity to effectively contribute online classes when large number of students are on the internet	3	4	4	4	3	3	3.5
9	Online notifications may not be seen timely	3	3	2	1	3	3	2.5
10	Not effective without being blended with prior face to face learning	4	3	4	4	4	4	3.8
11	Electricity not available/no facility to charge batteries/phones	4	5	5	5	4	4	4.5
12	Online instructions/chats are not sometimes understandable/too fast	2	4	3	3	3	3	3
13	Rush at entrance (Log In) to online classes at the last moment	4	4	4	4	4	4	4

**Table 4. Approach to narrative analysis**

#	Step	Basis	Outcome
1	Data collection	Telephonic interview with 32 academics using open ended unstructured questions	Recorded transcripts each spanning 20 to 40 minutes and notes taken during the telephone enquiry over the phenomena of online delivery
2	Reading transcripts	Listening and paraphrasing	A collection of dispersed opinion
3	Labeling	Concept, Context, Content, Adaptation, Approach, Digital divide, Tools, Work load, Assessment, Process, Recommendations	Individual reflection on 11 key attributes related to online delivery
4	Decision on relevance	Repeated statement and interviewee's explicit statement, research questions	Key opinion(s) enhancing the topicality of online delivery
5	Identifying patterns	The majority's viewpoint	Shared comprehension among the interviewees
6	Create categories	Similarity in arguments, and defenses, priority on research questions	A couple of more focused cluster of opinion related to each category
7	Look for connection(s)	Hierarchy, lateral process	Structured data with sense/logic (correlated)
8	Figuring out	Similarity in opinion	Identified connections of key variables

**Table 5. Outcome of narrative analysis**

#	Element	Academics' Shared View
1	Concept	Some solitary approaches used by online learning encourage passive learning. Blended learning would have been ideal.
2	Context	Sitting for long periods combined with isolation can lead to anxiety and poor health of students. Maintaining social interaction becomes quite harder. The question of time difference does not arise in Sri Lanka.
3	Content	There's an amazing amount of content online, but the big problem is how to separate quality and what's appropriate. Some people's information about what online education is or could be is outdated. Copyright issues arise.
4	Adaptation	Teachers had little or no notice about schools closing and shifting to online learning, so this can be challenging for anybody.
5	Approach	Encouraging student-to-student learning is more daunting, where students expect a more dynamic, less hierarchical, dialogue-driven format.
6	Digital divide	Student success is what online teaching efforts are all about and it is crucial to ensure no one is left out especially for students and faculty members in small cities and towns, where service can slow when everyone is trying to use videoconferencing at once. Students' anxiety and depression get worse for marginalized students who already live with scarcity, less social capital, and less structure. Internet coverage is not good enough and the speed of connection is low. Their only choice was the use of modems, cyber cafes, or personal Internet connections which were beyond the reach of some students and lecturers.
7	Tools	Students may not be able to access the popular global platforms such as Google and, increasingly, to virtual private networks (VPNs). Some online conferencing platforms, such as Zoom, will be overloaded and could crash. There are some students who don't have laptops
8	Work load	Heavier workloads as they scramble to post their teaching materials online and get to grips with what online lecturing involves. Some learning experiences cannot be replicated digitally. No good virtual substitutes for field trips or academic exchanges.
9	Assessment	The idea of being able to just port what is doing in a classroom into an online environment has its own problems and trying to do that in the midst of a pandemic is another problem altogether. Carrying out online assessments without risking cheating and plagiarism may be a challenge. homework gap" has left millions of students without broadband unable to complete their assignments at home
10	Process	Not all faculty members are equally adept at harnessing related technology and managing virtual classrooms
12	Recommendations	e-learning policy, enhanced digital platforms, enhanced IT infrastructure, support and troubleshooting, enhanced interaction between lectures and students

**4. CONCLUSIONS AND RECOMMENDATIONS**

This study concludes that successful implementation of e-learning can easily be achieved if these impediments can be addressed. Based on these challenges, this paper has suggested various recommendations that university colleges can adopt immediately, slowly and in long run. Despite the challenges, implementation of e-learning holds a substantial opportunity for Sri Lankan universities to expand accessibility to higher education. The aforementioned challenges of implementing e-

learning make it imperative for the universities and the government to work closely and come up with strategies so as to meet the educational needs of the country. It offers a series of recommendations implementable in three stages.

**IMMEDIATE MEASURES**

- Seek remote teaching tools and online platforms free of charge
- Maintain a vigorous presence on online discussion boards so they control discussion, provide answers and feedback

- Provide students with guidance on how best to approach their studies from home, keeping in mind how their movements or resources may be restricted
- Perform basic troubleshooting
- Give everyone an account for the web-conferencing program Zoom
- Offer online trauma counseling
- Establish virtual peer learning circles
- Seek zero-rate policies that facilitate learning via smartphone.
- Make sure all online apps work on mobile devices.
- Figure out how to buy or rent Wi-Fi hotspots and plan for devices and hotspots.
- Asynchronous communication tools like online chat channels, bulletin boards, discussion groups use to increase collaboration.
- Experiment feedback systems
- Adopt GroupMe, Slack, and WhatsApp for class work.
- Offer instructors advice on creating live, online classes through Zoom or prerecorded lectures with Voice Thread
- Upgrade videos so it'll be easier to watch them in places with slow internet
- Increase internet connectivity or subsidize data on mobiles
- Communicate with non-participants privately to encourage discussion
- Include virtual meetings, live chats or video tutorials to maintain a human connection.
- Assign duos or small groups and organize a live session where instructors encourage debate and answer questions.
- Provide different modes of interaction; webcam; classrooms with dedicated infrastructure to video lectures; online learning platforms like Canvas, Blackboard and Moodle as well as live-streaming options like Zoom and Skype
- Work closely with IT experts to ensure that programs are able to be supported online.
- Encourage instructor-student interchanges in virtual classrooms managed through learning management systems.
- Offer short webinars in which instructors can quickly learn the basics of videoconferencing or how to get the most out of their learning-management system.
- Focus on facilitating flipped classrooms, Moocs and other digital innovations and provide practical tips shared by fellow faculty and staff on the popular messaging platform WeChat.
- Provide feedback through online knowledge checks, comments on collaborative documents and chat to keep students motivated and moving forward.

### **SHORT TERM MEASURES**

- Create a narrative for each class, use polls, virtual break-out rooms, videos and open questions to reenergize learners
- Diversify assessment formats, relying less on essays and written exams and instead embracing oral exams using Zoom or Skype, or having students produce podcasts, YouTube videos, posters or Prezi presentations that is shared online.
- Use of online proctoring tools for assessments.
- Provide mobile hotspots to students those who don't have a usable internet connection to continue learning.
- Encourage them to develop healthy study habits that will help them to manage anxiety; try to remain flexible with teaching approach during this time.

### **LONG TERM MEASURES**

- E-learning policies to guide the implementation of online learning.
- Increase funding for e-learning, ICT infrastructure, research, capacity building, and awareness creation.
- Relinquish copyrights to lecturers who write quality and peer-reviewed modules.
- Revisit cognitive and non-cognitive development with e-learning.
- Prepare a step-by-step guide and disseminate via video and text, screenshots and screen-casting tutorials.
- Licenses or access to technology such as Zoom, Respondus and Microsoft Teams available to all teaching staff and students.
- Offer text-based interactive mechanisms such as blog-style formats.

### **IMPLICATIONS OF THE STUDY**

The findings of this research would in no doubt help to enhance the capacity of the academic community in various ways to meet similar satiation in the future. The study provides three-stage guidelines as to how educational entities can strengthen their capacities in terms of organizing their internal resources, capitalizing their strengths, exploiting the opportunities, minimizing shortcomings and facing the challenges for a successful and orderly transition

from traditional in-class deliveries to online deliveries.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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