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E-Learning during a global pandemic

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Abstract: The onset of the COVID-19 virus has tested education, social, and economic structures as the pandemic has spread around the world. UNESCOs monitoring indicates that over 181 countries have implemented nationwide school closures, impacting more than 1.5 billion students. Though many universities have some experience in online learning, they are not ready to move from under 25% of curriculum already developed to 100% of curriculum being available with teachers ready to go online. K-12 education is struggling with most districts having never invested in an e-learning infrastructure or established a technology backbone for e-learning delivery. The pandemic shines a light on the unequal access to the technologies necessary to be successful either as an online learner or as an instructor suddenly responsible for delivering content remotely. Suggestions for rapid response and iterative course design options, as well as current free access assets are offered in this article.

Keywords: global pandemic, e-learning readiness, rapid response, COVID-19, OER, open education resources, online learning, course assets, accessibility

Introduction

As of March 29, 2020, over 1.5 billion students were out of school due to school closures in response to COVID-19. According to UNESCO (2020), over 181 countries have implemented nationwide closures, impacting nearly 88% of the world's student population.

One might think online learning and content delivery would be a quick pivot as schools send students home in an effort to flatten the curve of COVID-19 infection. In reality, the pandemic shines a light on the unequal access to the technologies and processes necessary to be successful either as an online learner or as an instructor suddenly responsible for delivering content remotely.

In spite of a seemingly robust build out of e-learning curriculum at many universities, it is still the minority of course offerings. At a university near me, which is considered to have one of the largest online course catalogs in Oregon with 70 fully online degrees and over 1,300 classes, it represents only 23% of the total curriculum. They are now faced with putting all courses online for the quarter beginning March 30th and likely extending through all subsequent terms until spring 2021.

More difficult is the governor's pronouncement that all K-12 education will now be delivered online beginning March 31, 2020. There is not a single K-12 government school that has all online courses. Not one. There are contracted schools for those who cannot attend schools due to illness or disability. They are designed primarily for high school students, though a few cater to grammar and middle school students. Though the majority of schools may teach some technology courses, they are limited to personal computers in a classroom with a very small in-room network for that specific course (e.g., keyboarding). K-12 schools, in general, have neither the technical backbone support nor the instructor experience to deliver courses online.

UNESCO's response to school closures worldwide encourages us not only to respond to the current COVID-19 needs, but to use this opportunity to set up the infrastructure for the future. How does a state, province, or country get distance learning up and running quickly for all those students who may never have experienced it? How does a country massively train or prepare teachers within weeks—or even

months—who never thought they'd teach a course at a distance? How does a country make sure that all students can participate, not only the rich?

"I know we keep hearing schools closed for two weeks, and then a month, and then to the end of the school year. Yes, we need to act immediately, but we also need to be involved in setting up the infrastructure, the training, and the response for at least another school year to come until we either have herd immunity or a vaccine that works at least as good as current flu vaccines.

This is our opportunity to build and help all students in the future who are ill, who don't have technology resources, who find themselves unable to come to class for whatever reason." (COVID-19 Impact on Education, UNESCO, March 2020)

The Digital Divide and Worldwide Access

As I speak to faculty in the U.S., Japan, Sri Lanka, India, and Hong Kong, many are concerned about the economic disparities of their students. While living on campus with both social and technology supports, they may have thrived. But now that most have returned home and cannot come back for the foreseeable future, they fear that the structured environment that helped them succeed will not be there at home as they deal with everything else in their life.

The same concerns are even more evident for K-12 students who rely on the classroom environment for both learning and social needs. Unlike college and university students they are less likely to have access to technology and to understand how to use it.

We also know that many students don't have access to their own functioning laptops or desktop computer. Even if they have a cellphone or smartphone, they might worry about running out of minutes or the cost that will go with having to use large amounts of data to access class materials. Taskeen Adam (2020) wrote about this problem from the South African perspective, a country with a high poverty rate and lack of resources available to students.

In 2017, the ACT Equity Center in the U.S. surveyed 7,233 high school students about their access to devices, the reliability of the Internet connection available to them, and how often they use devices and access the internet for school-related work. Of students classified as "underserved," nearly 1 in 5 had access to only one device. One in 10 underserved students only had access to a smartphone.

Rural students were in even worse shape based on surves done in 2018. Twenty-seven percent of rural residents do not have access to broadband at a minimum speed for consistently receiving high-quality voice, data, graphics, and video or supporting multiple streams within a household. In addition, when schools were surveyed as to meeting federal connectivity benchmarks, 6% of schools still did not meet those standards. The vast majority of those schools were in rural areas.

For students who may be housing insecure, food insecure, or both, the economic fallout from COVID-19 may make it harder to simply navigate each day. Some colleges and universities ask students who might be experiencing hardship to reach out or fill out a form, but students from lower-income backgrounds and students from disenfranchised groups are often more hesitant to ask for help because they worry about being perceived negatively for needing help in those kinds of situations.

Do students have the digital skills to learn online?

Moore, R., Vitale, D, & Stawinoga, N., (2018) showed there continues to be a vastly unequal digital starting point for young urban citizens, in India, who are already held back by poverty and social exclusion. In particular, even students with access to devices may not have the digital skills to effectively learn online.

The study looked at gaps in ICT access and competency of students in Grade 7 and Grade 10. They were quizzed on our learning strands: 1) operating computers, 2) managing information using basic

computer programs, 3) communicating information; and 4) using and evaluating online resources. Across all schools tested, 59% of the total sample did not know how to retrieve a deleted file, 68% did not know what spreadsheets are used for, and 30% did not know how to shut down a computer correctly. Seventy-four percent of Grade 7 students did not know what a word processing program is. Children performed better on using online resources. While 91% could identify the icon for Facebook and 81% the YouTube icon, only 62% could identify the symbol for attachment and 72% for search.

Children from the most marginalized classes generally go to government schools. Those slightly better-off attend private aided schools or low-fee private schools. Students from the middle class study at higher-fee private-unaided schools. Schools for the privileged classes have the highest scores (73.4% for Grade 7 and 72.9% for Grade 10), while schools for the marginalized have the lowest (41.4% for Grade 7 and 45.4% for Grade 10).

In the university system, it was only in February 2020 that the government in India allowed universities to begin offering fully online degrees, and opened the door to a previously limited market of companies in the U.S. to offer those courses. However, that is limited to only the top 100 institutions in India's National Institutional Ranking Framework and the subject areas are restricted.

A survey of 9,987 students at the University of Queensland (2018) found that students value the role of technology in learning and recognize that possessing digital capabilities is critical to their future employment. However, respondents also indicated that many believed their courses did not prepare them for the digital workplace. While the majority of students want to develop their digital capabilities, 40% of students reported that they did not have time to develop their digital skills by themselves.

Inequities in resources and digital skills are not only about students. Faculty at colleges and universities do not have those skills either. Online instruction tends to fall to adjunct faculty, who are paid by the course and not allowed to take on full-time teaching loads. Who will then fill in the gaps for this massive delivery of courses and how will they be trained and supported?

How do we start and where do we go from here?

In one way we are fortunate to have a variety of tech resources in many classrooms and colleges/universities. However, those trained to use them and the support available for working from home, or via the few allowed on a campus, is going to make it more difficult. The way we have approached designing online courses over the last two decades is both media intensive and labor intensive, requiring instructional designers with expertise in technology and pedagogy. Though this has provided some excellent courses and interactive content, it has really been accessed for those who have the money and resources. We don't have time for that now, in this exact moment.

Back to the Future

I began developing online learning and distance learning in the mid 1980's with individual content modules for corporations with larger mainframe servers. Formal education institutions were mailing lessons to students and getting them back. These were primarily text based and included mailed assessments as well. Australia was a leader in these distance efforts in order to provide education deep in the outback.

My first involvement in fully online courses at a university began in 1997. Instructional modules were very short. Learning management systems consisted primarily of linked webpages and a discussion forum. Media was primarily images and text. Brevity was necessary and a focus on only a few difficult concepts was where the majority of media development efforts were put. We can do that again just to get everyone started.

In this moment of crisis everyone needs to think outside of the box, and we need to be realistic about setting expectations for this first surge of teaching online for both teachers and students who have never experienced this before.

An Educational Crisis and a Human Crisis

We need to understand this is not only about education but also about people living in crisis from day to day. That means students won't be able to be as focused as usual because they aren't in a classroom setting. They aren't safe from all the distractions of home. And those distractions are now multiplied because of other difficulties such as having the entire family at home. Other people may be trying to work from home and needing the Internet for their work. Many families will be facing economic devastation and wondering where their food is coming from or if they will continue to have a roof over their head.

Thus it is critical that we not forget the emotional health of our students and their families as we prepare for teaching. As Bozhurt, A. & Sharma, R. (2020) stated, "We should remember, when things go back to normal, people will not remember the educational content delivered, but they will remember how they felt, how we cared for them, and how we supported them." In Adam, T. (2020) description of the South African experience, he also highlighted the need for emotional care and support of students who no longer have a sense of community or safety. He suggests creating "shared spaces where students can feel a sense of community."

Edutopia (2020) highlighted these two reports from impacted teachers in Italy and Hong Kong. In Italy, teacher Jo Gillespie said after two weeks of delivering instruction via the Internet: "Feedback from students and families is 'less is more…Try Google quizzes using Forms, a reading log, some short live sessions with teachers and classmates, maybe vocabulary extension, maths and geometry problems (but not too many). And that's probably enough."

Keevan, a teacher in Hong Kong, said: "What would normally take you one class period to teach in the classroom will probably take you twice as long."

This is not a normal time, and we may not return to normal for months or even as long as a year. Just get started and do your best. You are a teacher. Below are some things to consider.

You know your students. You know where they typically have problems and where they find things easy—Concentrate on putting most of your time into those areas where students have problems. For the areas where they don't, give them more self-directed readings, assignments, and options. Consider that you have maybe half of the time you normally spend to keep their attention, make it count for those more difficult times.

Set expectations for yourself and your students -- Expect you and they will make mistakes. It is not possible to shift to 100% distance learning overnight. Even if there is curriculum available that can be replicated, teachers need to get used to it and see how it fits what they've been teaching.

Let your students know you are in this together and you may not know all the answers but you will look for them, and they can help as well. Giving students some links and asking them to find answers and share with each other and you is a great way to get them engaged and feeling like they are able to do something during this time of having little control.

Start with some lessons on digital skills and literacy – Below are some good online resources you can use that are free.

- Google for Education - *https://applieddigitalskills.withgoogle.com/en/teaching-resources*
- Digital Citizenship by Common sense education - *https://www.commonsense.org/education/digital-citizenship*
- Improving Digital Literacy in the Classroom - *from PBS Teachers Lounge with examples and links. https://www.pbs.org/education/blog/improving-digital-literacy-in-the-classroom*

Think about many options and what you can do immediately vs what you can do in a month or two—If you've never taught online and your normal way is to teach by talking to the students and writing things on the blackboard you can do that in several ways.

- If you have a tablet or computer with a camera, write out your "chalkboard" examples in large print on pieces of paper. You can hold them up to the camera while you talk.
- If you have a whiteboard, you can point a camera at that and talk and write as well. This doesn't have to be a fancy camera. It can be the video on your phone. Make them short, so it's easy to post.
- If you can't do video because you don't have the technology, then take pictures of your pieces of paper or a board and share those pictures.
- Take advantage of Open Education Resources (OER) wherever possible. These are short modules or lessons developed by educators on a diversity of topics.

Use web-conferencing where available - In China, which has a lot of technology at the university level, many teachers switched to using Zoom. There is a slight challenge to using the technology but it is not as difficult as one might guess. You need a camera (either in a computer or elsewhere). It is turned on and you can record it for later viewing for students who may have a problem with bandwidth or access at the livestream time.

The largest free conference call and web-conferencing is FreeConferenceCall.com. It's been around since 2001 at first just for audio conferencing but has now added web conferencing.

There are other web-conferencing options as well that are free. Some of them have limited numbers of people. For conferences up to 10 people: Google Hangouts, Join.Me, and Meeting Burner. These would be good for smaller groups.

Zoom is free for up to 50 participants but has a time limit of only 40 minutes per meeting in the free version. The time limit isn't horrible, considering keeping students engaged for 40 minutes is challenging.

Asynchronous video conferencing – A free tool from Microsoft, Flipgrid, allows for students and teachers to use the resources of video (up to 10 minutes at a time) and post it to a designated shared space for the teacher and/or classmates to see. The teacher can then respond to the video with their own video responses or send a note commenting on it. This helps for students and teachers to feel connected and to experience the normal interaction of body language and facial expressions, yet not be required to be simultaneously connected when life is already very challenged for time.

Audio conferencing—There may be times when you don't need web-conferencing and a phone call will do. Also for those teaching in rural areas where Internet bandwidth may be limited, audio conferencing may be the better option. Some good free options there are FreeConference.com which allows up to 1,000 people on a call. This might be something to also offer for study groups for students.

The nice thing about these web-conferencing tools is that you can also record it to be watched later. And for those who simply can't access it at all due to bandwidth, you could download the recording and put it on a CD to ship by mail.

Educational television—Back in the middle of the 20th century countries invested heavily in educational television. When the internet became ubiquitous it seemed to disappear. It may be a time to consider using open access channels or getting public television to provide access to teachers and do some recording that can go out via television for those with little to no access to the Internet.

Resources for Content and Self-Study

Teachers don't have to come up with everything on the spot. Fortunately, for the past two decades people around the world have joined the Creative Commons community to develop and share modules of resources for free. This content is kept in what is called Open Education Resources

databases. The subjects covered are vast and many of the options are engaging and use media that teachers may not normally be able to develop themselves. Here are two large databases.

- Open Education Resources Commons—From Kindergarten through College in many subjects https://www.oercommons.org/
- Educause Open Educational Resources—for higher education courses https://library.educause.edu/topics/teaching-and-learning/open-educational-resources-oer
- Digital Videos for Education—over 100 videos with a diversity of topics free for educational use http://digitalliteracy.us/video-sites-for-educators/

Conclusion and Suggestions

Global pandemics require highly motivated, highly educated bureaucrats; public schools that train students to think both deeply and flexibly; and teachers that can model critical thinking and problem-solving. Though we might all wish we had more time to prepare, the reality is we don't. It's time to step up and do what we can. In many ways we are very fortunate it is 2020 instead of 1980 or even 1990 because we do have more resources to bring. Those resources include a plethora of open education resource (OER) assets ranging from single text documents or books to multimedia presentations, math labs, and simulation exercises. Using some of the links provided in this article, teachers can begin to immediately find resources that match their curriculum needs.

A number of organizations, both for-profit and nonprofit, are stepping up to provide options for students who are economically disadvantaged. I've seen technology companies providing tablets for students who had nothing previously. I've seen cable and Internet companies beginning programs for economically disadvantaged families by providing basic Internet Access at no cost, and promised to last for the length of the pandemic and school closures. In addition, instructional technologists and distance education experts have been penning numerous articles and sharing YouTube videos to assist teachers in quickly learning a few skills, as well as making them aware of free tools that may help them to prepare and deliver instruction.

In order to move quickly, while maintaining quality learning for students, it is important to embrace an iterative process of design and instruction. The teacher must take some time to reflect on critical areas of confusion for their students and spend the majority of time sourcing robust options to address those, while allowing for basic worksheets and readings fort he remainder of the instruction in the first offering of the class. In some cases, it may be that the instructor is putting together the lessons for the next week just-in-time for delivery. A quick assessment of student understanding or a check-in may provide insights for the next set of lessons.

It is important to forgive oneself as a teacher, as well as students, all of whom are struggling to operate within the constraints of their time, knowledge, and the ever-changing safety rules of the pandemic. Rather than react with panic and putting up worksheets and other independent options, take time to slow down and embrace that you cannot recreate your face-to-face classroom online and that this will be an iterative process of discovery, learning, and course improvement.

Embrace the realization that no one can function at full capacity during this crisis, neither teachers nor learners. This is an emergency with a lot of unknowns as to the future of education and it's delivery. Initial efforts should focus on creating micro units that engage your students and rewards them for any participation they can muster. Instead of slavish adherence to the specific tenets of your entire terms goals and objectives, focus this first term on delivering education with compassion and understanding as both you and your students learn what is possible in this environment.

The most recent scientific analysis suggests we may be facing two years or more of subsequent waves of exposure and shutdowns as each country makes decisions about the best means to keep people safe while juggling economic devastation. This means that teachers and students must continue to use e-learning as a delivery method.

It is time to recognize this is not a short-term effort. Therefore, we need to embrace these changes as a long-term response that will develop and improve over the next few years. That response should include the development of better infrastructure, policies for quality improvement, accessibility standards and strategic plans for continued Access in the future. As UNESCO suggested: "*This is our opportunity to build and help all students in the future who are ill, who don't have technology resources, who find themselves unable to come to class for whatever reason."*

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