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Abstract:

The COVID-19 pandemic brought unprecedented challenges and changes to higher education. More than 100 countries went into lockdown, severely affecting education systems worldwide. There was an expectation that higher education institutes would "find solutions" — and fast. Many questions arose concerning the role of online courses, technology-mediated learning resources and the long-term effects of the pandemic on students, faculty, and institutions. Information systems educators from Southern Africa came together at the 51st Annual Conference of the Southern African Computer Lecturers' Association (SACLA 2022). The panel reported on here was part of that conference and brought together information systems educators from three countries, South Africa, Mexico, and the United States to share their experiences and reflections regarding the effects of the COVID-19 transition and its aftermath. A wide-ranging discussion ensued, that ran the gamut from micro-level individual experiences to macro-level effects and challenges. These perspectives cover "big picture" challenges and observations, inclusion and exclusion considerations, threats and opportunities, and two reports of experiences and the resulting modifications in COVID-19-classrooms. This panel report also focused on the lessons learned from the conference attendees' discussion and suggested a possible future research agenda.

Keywords: COVID-19, Distance Education, Online Classes.

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1 Introduction

The COVID-19 pandemic presented unprecedented challenges to higher education, leading most universities to transition to online classes swiftly. This transition was jarring to universities, faculty, and students across the world. Reflecting on their experiences during the pandemic, many faculty now consider the long-term effects on themselves, their students, and their universities. Some faculty are also contemplating what they have learned and how their new knowledge might lead to post-pandemic teaching improvements.

While the pandemic accelerated the digital transformation of higher education, it also drew attention to some problems in moving toward digital transformation.

In July 2022, information systems educators from Southern Africa came together in the 51st Annual Conference of the Southern African Computer Lecturers' Association (SACLA 2022). The panel reported on here was part of that conference and brought together information systems educators from three countries, South Africa, Mexico, and the United States. These experienced faculty shared their experiences and reflections regarding the effects of the COVID-19 transition in a wide-ranging discussion that ran the gamut from micro-level individual experiences to macro-level effects and challenges. It is these challenges that form a central part of our discussions – they varied from institution to institution, from country to country, from student to student and even among faculty. This panel has provided us with an opportunity to evaluate and indeed to demonstrate the issues identified in a UNESCO report (UNESCO, 2020).

Although the future is still unclear, COVID-19 may have moved higher education from an equilibrium period of incremental change to a more revolutionary period of upheaval. We are seeing the lingering effects, with administrations seeking to take advantage of digital learning, students demanding more flexibility in modalities (even from class session to class session), and faculty trying to cope with related uncertainty and changes. One thing that clearly emerged from our panel is that the future remains unclear. On the one hand, changes seem inevitable, but on the other hand, organizational inertia is strong, especially in what Gilbert (2005) calls "routine rigidity." People are tired of uncertainty and change, which argues for a return to former practices. But some administrations and faculty are keen to leverage the investments made in new technology, infrastructure, and knowledge. Faculty and institutions face numerous challenges and opportunities regardless of what the "new normal" becomes. Our panel tried to delineate some of these and also offers some suggestions on how to prepare for and cope with the immediate aftermath of the changes brought by COVID-19.

Information Systems online education is an example of the sociotechnical perspective – one that considers the technical artifacts as well as the individuals/collectives that develop and use the artifacts in social (e.g., psychological, cultural, and economic) contexts (Sarker et al, 2019). As such we hope that as practitioners in this area, our thoughts will be useful to academics in other disciplines as well as our own colleagues in IS, and in encouraging further research from an Information Systems perspective. To this end, towards the end of the paper we have put together some suggestions for a Research Agenda.

The paper is organized as follows: we begin by providing some background outlining potential implications of what has taken place to date, we then provide a perspective from each of the five panelists. These perspectives cover "big picture" challenges and observations, inclusion, and exclusion considerations, threats, and opportunities, and two reports of experiences and the resulting modifications in COVID-19 classrooms. Questions from the audience are included, as is a summary of the discussion that took place as a result. Finally, we attempt to integrate our thoughts and provide a tentative Research Agenda.

2 Background

Before the COVID-19 crisis, the United Nation's Global Sustainable Development Goal 4 (Quality Education) recognized the need for flexible higher education systems (Martin & Furiv, 2020). However, what COVID-19 might show us is that we are still far from achieving this goal. The effect of the pandemic has been tremendous with more than 100 countries going into lockdown, having a serious effect on the education system worldwide (Dennis, 2020; Elfirdoussi et al., 2020; García-Morales, Garrido-Moreno, & Martín-Rojas, 2021; Van Slyke, Clary, & Tazkarji, 2022; Wang & Huang, 2021; Weldon, Ma, Ho, & Li, 2021; Zheng, Lin, He, Freudenreich, & Liu, 2021).

On the other hand, COVID-19 might have assisted in pushing higher education closer to reaching Goal 4 faster than what would have been the case without such a pandemic, an unintended consequence perhaps? There is a call for higher education institutes, to "find solutions — and fast — to avoid a dip in the quality of education they are providing" (Kandri, 2020, para. 1). We must remember that these online teaching models and virtual environments are here to stay, and we, as higher education institutions, should embrace this (Camilleri, 2021) rather than fight it. As the pandemic continues, most institutions are opening their doors; face-to-face contact is returning. Van Slyke et al. (2022) as well as Clary, Dick, Akbulut, and Van Slyke (2022) note students' preference towards face-to-face learning, as this is what often, they signed up for. Universities too are keen to reopen the doors to their classrooms. While university administrations coped (in most cases) better than might have been expected with the exigencies brought on by the pandemic, the experience also underlined some of the problems digital transformation of higher education might incur. The question remains: what will lead students to continue with online learning now that the pandemic seems to be ending, what intention do they have to continue online education, and what will affect that intention?

At this point, we should point out that the transformation of organizational practices and procedures is difficult – indeed is especially difficult in entrenched and historical institutions like those found in higher education. Such organizations find themselves locked into their current operational processes which are reinforced by self-reinforcing feedback (Sydow, Schreyögg and Kock, 2009). Particularly relevant here too is the conclusion by Tripsas and Gavette (2000) that the ability to distinguish between developments in new technologies and changes requiring strategic shifts in beliefs. In the pandemic, universities had to deal with both simultaneously. It is very possible that the extraordinary upheaval brought about by Covid-19 was too much all at once and promoted a longing for a return to "normality" – what we knew and understood, a form of inertia as discussed by Gilbert (2005).

In biology, punctuated equilibrium suggests that change takes place in spurts following long periods of stability (Gersick, 1991). Was Covid-19 higher education's punctuated equilibrium moment? Furthering our understanding of that question is what this panel was about. Two theoretical perspectives were influential in shaping our thinking around the question of the long-term effects of COVID-19 on higher education in general, and information systems education in particular. The first, punctuated equilibrium theory posits that systems go through long periods during which environmental conditions are relatively stable, leading to only incremental evolution. These periods of equilibrium are upset (punctuated) by "revolutionary" periods brought on by sudden, dramatic environmental changes. COVID-19 may represent the catalyst for a revolutionary period for higher education, although this remains to be seen. The salient point for our thinking is that the pandemic upset the normal order of things, which led to the need to adapt quickly and dramatically, for example by the sudden widespread (almost universal) adoption of distance learning.

Our thinking was also shaped by aspects of institutional theory, which claims that organizations in an industry become increasingly similar over time as a result of three isomorphic pressures (normative, coercive, and mimetic) (DiMaggio & Powell, 1983). Once some universities started reacting to COVID-19, other universities started to act similarly, either through imitation, the perception that certain responses, such as implementing distance learning and closing campuses, are the norm, or through pressures exerted by entities such as governmental bodies. These forces may account for the striking similarity of responses globally.

Note that although these theories shaped some of our thinking, our intent is not to make arguments for the presence of certain effects, nor to test these effects. Rather these were two of the theoretical perspectives that helped guide us as we thought through the issues raised in the panel. Further, these theories argue that, although organizational change and transformation are hard, an event such as COVID-19 has the ability to upset the normal way of things, making change easier (although perhaps more chaotic than would be ideal). In addition, both punctuated equilibrium and institutional theory may argue that over time, some changes would become the "new normal" and become embedded in new deep structures, eventually leading to a new period of stability. Of course, this is not the only possible scenario; over time, we may find that inertia brings universities back to their former ways of operating. As repeatedly pointed out by management scholars, lasting change is hard to implement (e.g. Mantere, et al., 2012), even in periods of crisis (Gilbert, 2005).

At the beginning of 2022, although many universities had returned to on-campus instructions, some institutions remained online, perhaps from an abundance of caution. Some universities opened their doors only to the few fully vaccinated students. Other institutions opted for limited capacity, as stated under

government regulations, with no compulsory vaccinations for staff and students. It meant that in many countries, much of the teaching during the first semester of 2022 remained entirely online. Conditions and restrictions varied widely across countries. For example, in South Africa, a few Universities opened but limited capacity to a maximum of 2,000 people at any one time on any campus. However, in the United States, most universities had returned to on-campus courses, often with restrictions related to social distancing and vaccination status.

The online teaching model has been experienced by millions of students. Whether we go back to face-to-face classes or not, we can expect changes. We've learned to use digital tools, and even if we don't see instances of digital transformation writ large, there is increasing use of digital tools such as recorded hybrid presentations, video tutorials, virtual office hours with screen sharing, etc. As an example, one of the authors of this panel who runs office hours simultaneously in his room at the university and connected to a video conference tool (to which all faculty and students have access) was recently approached by a student with a problem – it was resolved by screen sharing. It is hard to believe that such a course of events would have occurred so seamlessly four years ago. Digital transformation may occur in a similar way to the development of autonomous vehicles, where while the much-hyped driverless car has not developed to the point anticipated by many, we have seen many driverless car necessary features incorporated into automobiles – automatic braking, lane change warnings, rear-view cameras, etc. What we could be looking at is an extended period of incremental change rather than rapid transformation. Digital transformation in higher education, however, cannot be seen as uni-dimensional, and it is not the result of simply buying technology and implementing a robust information technology infrastructure. Moreover, it needs to recognize the need to appropriate technology tailored specifically to learning and knowledge processes. Additionally, the educational model should not be a simple digital reproduction of a traditional one, used for face-to-face interaction. Finally, there should also be organizational and collaboration technology that integrates class management with the school administration (v.gr. integrating the information contained in the LMS with the administrative systems to automatically populate classes and record final grades). Thus, at least three levels of IT implementation need to be integrated to better cope with uncertainty and volatile environments (Martínez-Pérez & Rodríguez-Abitia, 2021). This panel presentation and the ensuing discussion allows academia globally to share our experiences and thoughts and perhaps consider their own practices.

The conference was attended by approximately 50 academics who shared their knowledge and experience on teaching and learning as well as research related to education. This panel of experienced faculty provided an international perspective and raised questions academics could consider when returning to campuses post-COVID-19. In keeping with the higher education transformational experiences the panel was conducted in a hybrid mode, with most panelists participating remotely, and one panelist and some of the audience participating onsite.

We see the essential importance of this panel report in several ways. First, it documents our multi-national experiences in this area and highlights problems and opportunities. Secondly, it relates experiences from several different regions of the world and differing university systems providing real-world practical examples of the sorts of issues that might be at the forefront of any move to digital transformation - it is not likely to be smooth sailing. Thirdly, it proposes areas that we see as needing to be addressed by university administrations and IS researchers. Although the COVID-19 pandemic and the changes and challenges it brought to education was a (hopefully) novel event, it is likely not the last time information systems educators will be called on to respond quickly and effectively to difficulties brought on by external events. Because of this, we seek to document and share the insights provided during the panel and subsequent discussion in this report.

3 Topics

As might be expected bringing together faculty from around the world to share their thoughts and experiences on how they and their institutions coped with an extraordinarily disruptive event yielded a very varied agenda and a large range of comments. In addition to the panel presenters the conference attendees were also invited to comment. To provide some indication of what follows we have attempted to provide a summary in the following table.

Table 1. Agenda Summary

Topic	Discussant / Section?	Take-aways
Digital Inequity	2,1, 2.2	Any further use of technology-enhanced education must consider the physical and socio-economic factors facilitating its use
Opportunities for change	2.1, 2.3, 2.4	Lessons have been learned – can we remember them / use them in the future
What is required of university administration	2.1, 3,2	Future enrollment intakes may require remedial or make up classes.
Technology is changing higher education	2.2	But we are not sure, yet, how. The pandemic has provided the opportunity to introduce students and faculty to wider rangers of technology – change can be expected, but how fast?
Social contact as part of the university experiences is important, indeed may be paramount for some	2.2	Students like being with their classmates – this suggests that future developments in online class will be for some of the students, some of the time
Opportunities from more online: Attractive for some Expanded enrolments. Cost saving	2.3, 2.4, 4.3,	Opportunities are more important for some, but not all.
Threats from more online: Faculty conditions Students' engagement	2.3, 2.4, 2.5, 3, 4.4	Technology can be expected to disrupt the traditional faculty approach to higher education. Student engagement is paramount. Technology can only go so far – the key factors will be faculty and institutional support
Need for a robust learning environment	2.3, 2.5, 3.3,	We must maintain an environment where the student getting credit is the one doing the work

3.1 High-Level Challenges and Observations

Dealing with COVID-19 has led to or exposed a number of challenges for higher education. Three of these were highlighted by one of the panelists – digital inequities, long-term effects on higher education, and "downstream" effects that must be dealt with by universities.

Even in a highly developed country like the United States, digital inequities exist. The shift to online education and working from home exposed these inequities, which take at least two forms, poor quality Internet access and lack of access to digital devices. Moving courses online may have been the only way to continue educational programs, but digital inequities made the effects of this transition unequally distributed. Poorer households often lack affordable, high-quality Internet access and access to digital devices. Rural households may also suffer from a dearth of high-quality Internet access, even among wealthier households.

Inequities related to Internet access were highlighted by U.S. President Biden, who stated:

> *This pandemic has made clear the need for affordable and available high-speed Internet. The idea of a parent having to put their kids in the car for virtual learning, drive and sit in the McDonald's parking lot so that their child can access the Internet when school is taught virtually is not only unnecessary, it's just wrong. It's wrong*. (Biden, 2021)

For the urban and suburban poor high-quality Internet access and digital devices may be cost-prohibitive. This is especially problematic for households that have multiple children learning from home while parents attempt to work from home. For example, according to a 2022 report from the Pew Research Center, 20% of low-income household teens in the United States reported that they did not have access to a laptop or desktop computer at home. This was substantially higher than for high-income households (Schaeffer, 2022).

Internet access is a problem for many rural Americans. For many, the only broadband Internet option is fixed satellite service, which is typically slow (often < 5 Mbps in practice), expensive (> US$100 per month), and subject to data caps. Even very expensive plans costing US$ 300 per month are subject to 150 GB data caps. In addition, due to the technology used, latency is high, typically more than 500 mbs, which can make video conferencing a significant challenge. In addition, these systems are subject to weather-related outages in heavy thunderstorms.

Cellular Internet is a viable option for some rural households for whom wired Internet is unavailable. Although these systems can perform well, they are typically expensive, subject to strict data caps, and are often technically complex. The situation is improving as more mobile communication providers offer fixed wireless home Internet solutions, but currently, these are subject to limited availability. Newer technologies such as SpaceX's Starlink offer great promise but are expensive and are not yet widely available. (Waiting times for Starlink can be well over a year.)

Wired DSL service, which has often been the solution for rural Internet access, is slow (sometimes 1.5 Mbps or less), can be expensive, and is becoming less available as telecommunication companies abandon DSL line maintenance in many areas. Often, large telecommunication providers are continuing to provide DSL service to existing customers but are not allowing new service connections.

Fortunately, the U.S. Federal government is taking steps to alleviate Internet access problems. A recent infrastructure bill provides approximately $65 billion in funding for broadband infrastructure. This funding is intended to narrow the digital divide. Unfortunately, similar programs have been rife with problems and have not met expectations. Early indications are that the current funding encourages increased broadband access in rural areas.

It is important to note that these issues are, of course, not limited to the United States. In fact, digital inequities may be worse in developing countries, as discussed later. For example, according to a 2021 report from Statistics South Africa (2021), only 8.3% of households in South Africa had fixed Internet access at home. The situation in rural areas is especially bad, with less than 1% having fixed Internet access at home. Most South Africans use mobile devices for Internet access. Unfortunately, such Internet access is less than ideal for online learning.

Currently, the long-term effects of COVID-19 on universities are unclear. What is clear, however, is that many schools face a bit of a dilemma. For many years, residential institutions have touted the advantages of face-to-face learning, claiming that online education was inferior. But, during COVID-19 restrictions, many of these same universities claimed that online education was adequate for the continuation of learning activities. The good news for these universities is that for many students the time spent off campus reinforced the value of a residential university experience. It is important to recognize that formal learning activities are only part of this experience. Social interactions are also important; these are difficult to duplicate online.

However, some schools are expanding online offerings for on-campus students. The convenience of online courses is attractive to many students, even those who prefer a residential experience. A mix of face-to-face and online courses may allow these students to take advantage of the physical campus environment and gain from selective online courses offered (Lockee & Clark-Stallkamp, 2022). This is not new, of course, but is expanding due to the experiences students and universities gained during COVID-19 restrictions. A move to increasing online course offerings is not without risk, however. The importance of compatibility between students and online courses is well established as a factor in distance learning acceptance (Van Slyke, et al., 2010; Clary et al., 2022).

Another potential long-term effect of the online experience universities gained during COVID-19 involves better integrating technology into face-to-face courses. For example, out of necessity many universities increased their capabilities to record video lectures and tutorials. Similarly, many professors gained experience in creating digital content for their courses. More refined uses of digital content can go beyond simple lectures and tutorials to apply teaching methods such as scaffolding that blends theory and practical application (Frost, 2022). Many faculty also went through great lengths to develop online learning materials and to better organize learning management systems to facilitate online courses. These materials and structures can easily be adapted and used to supplement face-to-face instruction.

Universities may also need to deal with another consequence of the abrupt shifts brought on by COVID-19, a legacy of leniency. In the early days of the pandemic, there were calls for faculty to "… practice patience and leniency with our students" (Barton et al., 2020, p. 183). Standards were often relaxed, due dates became more flexible, and many faculty rightfully tried to be accommodating to students struggling with the effects of the pandemic. Although increased leniency certainly was critical during the COVID-19 crisis, at some point it will be important to return to pre-pandemic notions of rigor and quality. Tightening educational standards will be challenging. Some students will have become used to looser standards and increased leniency; they may resist a return to earlier standards. It will be important for faculty and administrators to present a united front when returning to higher standards. Otherwise, individual faculty are likely to face considerable resentment from some students. Note that we are not calling for an end to

compassion and understanding. Rather, we are advocating for thinking about the long-term impact of low rigor on students. We believe that appropriate standards are beneficial for students in the long run.

A less obvious potential long-term effect on universities will come from increased agility. Institutions across the world had to make radical, rapid adaptations in response to the implementation of COVID-19 restrictions. As noted earlier, it may be naive to think that this will be the last time universities have to quickly adapt in order to continue operations. The range of possible disruptive events is long, from pandemics to natural disasters; there are many external events that may bring yet another shift to online courses. Universities would be well advised to use what they have learned from COVID-19 to build effective continuity plans that can be implemented to respond to future disruptions. It is important to note that it is not only educational processes that must be continued; administrative processes are also critical. "Never waste a good crisis" is a philosophy that has been attributed to political leaders from Machiavelli to Hilary Clinton. One potential benefit of a crisis is the organizational learning that can occur. University administrations and faculty should take some time to reflect on what they have learned during COVID-19, and to use that learning to increase resilience to future disruptive events.

Universities and faculty must also be aware of the potential "downstream" effects on secondary school students who are entering or will soon enter the university. Student learning suffered during the pandemic. According to a report from McKinsey (Dorn et al., 2021) students in primary and secondary schools in the U.S. are an average of four months behind in learning in reading and five months in mathematics. Given that the academic year is typically nine months, these figures represent approximately one half of a year's learning. This "unfinished learning" will make its way to universities that must be prepared to offer remedial education to students who are behind due to the pandemic. As was the case with access to digital resources, the effects of unfinished learning are unevenly distributed. Students of color and students from low-income households have longer mean learning deficits than white, more affluent students (Dorn et al., 2021).

This same report found that primary and secondary students suffered from greater anxiety and depression during the pandemic than prior to COVID-19. In addition, students exhibited greater social withdrawal, self-isolation, lethargy, and irrational fear. Chronic absenteeism approximately doubled from pre-pandemic levels. Interestingly, the increases were similar across demographic groups. So, universities will be dealing with the effects of psychological and learning problems for some time to come. Given the already stretched budgets, it will be a significant challenge for institutions to find the resources necessary to provide services for students who suffered during the pandemic.

3.2 Distance Education as a Means for Inclusion or Exclusion

Online learning provides the potential for great benefits in education. First, the use of infrastructure can be optimized by creating models that require a lesser physical presence in a classroom and more relevant work from home, either to prepare for class or to reinforce the acquisition of knowledge. Thus, time is released for a classroom or laboratory, allowing capacity to increase enrolment and impact a greater number of students. Also, digital libraries can be much more abundant in resources, and even shared among educational institutions. Second, educational technology may prove very useful for creating innovative ways to deliver content, by means of gamification, virtual reality, and other interactive and attractive means to achieve student engagement. Third, it is possible to reach people in remote communities, where commuting can be cumbersome or infeasible. Finally, online learning eliminates physical limitations, allowing recruitment of teachers from a greater pool, not limited by place of residence. As a result of these benefits, online learning can prove effective in promoting inclusion in education.

However, it would be naïve to think that these benefits would be possible to realize at no cost. Paramount in effective online learning is access to the appropriate information technology. This condition is not easily met, especially in emerging countries, where contrasts are more evident. In Mexico, as in other less developed economies, there are many factors that challenge the feasibility of inclusive online learning. There is a great contrast between public and private universities, both because of the different availability of resources in different institutions and because of the difference in the economic level of the students. As a result, there are great differences in the use of information technology to support the education process. Some institutions have a long and robust tradition of taking advantage of Learning Management Systems (LMS), virtual laboratories and other tools, simulations, educational games, digital libraries, etc., while others simply use IT for basic administrative processes. In some other universities, the norms do not allow the use of technology to be mandatory, hence leaving it up to the professor to decide how much she or he relies on it for classes. A related factor is a disparity in the level of digital literacy present in the

faculty members, making it hard to implement technology deployment plans. On the other hand, many students are happy in their comfort zone as passive learners, not wanting to change to a more active-learning model. With all these deterrents, the use of online learning can become a means for exclusion of those students and professors who do not meet the conditions to fully engage in it.

The lack of the appropriate infrastructure at home is a great inhibitor of effective online learning. A recent survey of 702 university students in Mexico (conducted by one of the panelists for a study currently underway), shows that the average number of people in the household is 4.32, and the average number of devices available is 5.12. This could be misinterpreted as a good sign. Yet, this number includes mobile phones, which are far from ideal for online instruction, and are limited in their ability to receive a class via steaming. However, most mobile phones in the country are in a pre-payment modality, making them unaffordable to use without Wi-Fi connectivity. In that regard, more than 37% of the respondents indicate that their Internet access at home is either inexistent or slow and insufficient. During the lockdown, having all members of the household competing for bandwidth and an appropriate private physical space to attend a class or work from home created great problems, especially because there was a minimal possibility to vary the times of use.

As mentioned before, the contrast between public and private universities is a breeding ground for exclusion. One of the most important and largest private universities in Mexico has used technology as a part of the education process for a great number of years. Students are required to have their own laptops and connectivity at home. Wi-Fi is widespread on campus, and there are many complementing IT services. Both professors and students have a high level of digital literacy, and LMS coverage is close to 100%. On the other hand, the largest and most important public university has traditionally had an optional technology use policy. It is estimated that LMS coverage before the COVID-19 pandemic ranged between 5 and 10%, and between 10 and 20% of the students had no Internet or computer at home. Even though great efforts were made to go online as a result of the pandemic, greatly increasing the number of courses supported by LMS, up to 70,000 students simply did not have access to them (Rodríguez-Abitia, 2021).

In addition to not having access, privacy, or sufficient resources, other barriers to effective online learning included the fact that professors were not prepared for the use of technology and online educational models, thereby simply replicating their in-person classes through a videoconferencing tool. This behavior was actually enforced by administrators, who required the faculty to run online sessions equal in duration to those that existed as face-to-face before the crisis rather than promote different ways to interact and achieve the same educational goals. Additionally, there was no access to specialized software that was normally available in computer labs on campus facilities. Finally, many administrative processes were not designed to be online, making it difficult to break the bureaucracy and move forward with activities like thesis presentations and the like.

Students seemed to like not having to commute, particularly in a large and complicated place like Mexico City. Nonetheless, they expressed missing their peers and living their campus experience. Also, the online classes were not perceived as exciting or engaging in general, and they were eager, to a certain extent, to leave the crowded space at home. Many of them, however, feared that being in the same classroom with 80 other students was not safe. Most of them would have liked the flexibility to choose some classes online and others in person.

COVID-19 undoubtedly represented an abrupt leap forward, forcing students and professors to adopt online learning and explore available technologies. Nevertheless, moving quickly to an online environment without securing the appropriate and necessary access and infrastructure conditions may increase the digital gap rather than close it. There is a great risk of increasing exclusion, at least for the most marginalized groups.

3.3 Opportunities and Threats

During the pandemic, we as academics have often encountered many empty chairs at empty tables, a poignant visualization of just how deeply it affected our day-to-day lives. We have also seen hallways of empty faculty offices. On the bright side, these are reminders of how well the higher education system coped during COVID-19 – we actually managed to teach most of our students at least something during that time, in circumstances very different to the usual (and of course in many cases very different to what was signed up for). Nevertheless, COVID-19 showed us what was possible – perhaps we would be able to benefit from this exposure or perhaps we would see the disruption as fleeting and aim. The pandemic

provided us with both opportunities and threats. The forced testing of online classes forced upon us all by Covid-19 highlighted for us both the good and bad,

Let's begin with the opportunities. There are clear opportunities for both faculty and university administrations. There is little doubt that for some, online classes are an attractive proposition. For faculty, they mean the opportunity to avoid or reduce a commute, better organize one's time for research or consulting projects, work at a time that suits family or household commitments and pressures, and for some, the opportunity to work in a completely different state or even country (although administratively this can be complex). University administrations can see potential advantages in expanding student enrolments (now that all students have been exposed to online classes and lived through them, we can expect that an increased number may be interested in taking at least some this way). Prospective savings in classroom expenses are bound to be on the agenda – it will be much cheaper to build and maintain a "Zoom-room" than a traditional classroom. Not only does remote work broaden the potential recruitment base but diversity in faculty hiring will be more possible if professors can work at a distance – indeed some program chiefs may like to advertise their programs as having international faculty teaching in them.

Now, let's turn to the threats. Those empty offices? It will not be long before the bean-counters start asking the question "If you are not coming into the university on a frequent basis to do your work, why do you need an office?" We will soon see sharing of office space, or hot-desking in a manner similar to what we provide adjuncts, maybe not right away, but at least a move in this direction is coming soon. And apart from the office work-space, consider the actual faculty member. A broadened recruitment pool means more competition for academic positions and tenure and probably (at least in the short term) a greater use of adjuncts. As university budgets continue to tighten, governments and university administrations have not shown any reticence in moving down this path to date. It must be remembered too that online classes are not for everyone. Student engagement is all important (Dick, 2021). Students who have poor self-efficacy (are not good at time management, do not work well without some degree of supervision), need technological support or some other form of hand-holding, will not succeed here – perhaps this will lead to a dichotomized student body, or even worse, pressure to run the same class as a form of hybrid where some attend online (allowed to) and some in person (required to). This is not a path anyone would wish to go down except for the emergency brought on by a repeat pandemic.

We are already seeing movements in the directions I have outlined above. CETYS, a small private university in Mexico, armed with their students' willingness to continue to take some of their classes online, has modified an undergraduate International Business program to include a small number of classes taught on Zoom by professors outside the country – this is built into the promotion of the program as "classes taught by international professors". The higher education system in Pennsylvania has sold the building that housed the Chancellor's Office (no less!) and made the occupants remote workers in an attempt to be innovative and in touch with the changing work expectations and realities. It used the money to help pay for the consolidation of several campuses (D'Agostino, 2022).

How can we move to where we might like to be? In one sense, COVID-19 presented with a real-life example of the process of change coming from local improvisations responding to deliberate variations in practice (Orlikowski, 1996). While faculty, aided by university administrations, tried their best to improvise, it was obvious that not all classes are suitable for online delivery. If we want to push online classes further, we should not risk jeopardizing the online education image by trying to make them so. We need to recognize this up front. The same applies to students – we will need to develop something like our identification of "at risk" student systems to identify those whom we might wish to dissuade. Perhaps we need to recognize that online delivery may be a better option for graduate students or seniors. Student engagement is so important here… wanting to be there and take part in the online classroom is a huge step in that direction. The COVID-19 experience equaled not wanting to be there for many who were forced into that environment. COVID-19 also identified inequities across socio-economic groups and failures or shortcomings in technology availability. Student attributes are important, and we will need to identify those who will not or will be unlikely to, cope – issues such as time management and self-efficacy become critically important. Technology and the associated support take on new importance – if we are offering anywhere/anytime classes we need to offer anywhere/anytime support too. Those Zoom-room classrooms mentioned above maybe more expensive than they first appear. The students need to be technically capable and possess reliable connections – otherwise frustration and anger will well up. And we will need to design our courses to identify students having problems, provide shorter presentations than we are used to and ensure access to resources (Dick, Akbulut, & Matta, 2020).

But none of this will come to pass unless we ensure one particular outcome. As professors, program administrators, and anyone involved in teaching, we must be in a position to ensure that the student getting credit for the work handed in is the one who actually completed it. For a long time, many online classes have been seen as somewhat inferior to their face-to-face counterparts partly due to this issue. Many of us have even promoted this view for our programs and now find ourselves in the invidious position of saying we were able to offer acceptable teaching during the pandemic, after all, flying in the face of our previous pronouncements. It is essential that we will build a robust learning and assessment environment to achieve this outcome. There are many horror stories around cheating and plagiarism brought on, or exacerbated, by COVID-19 – dramatic rises in student grades, widespread use of writing and answer factories, use of phones in Zoom exams, etc., etc., etc. Clearly, this is untenable for any program aiming to be successful and to have its graduates sought-after. Many solutions have been tried – bringing students in for proctored exams, use of technology to monitor the students taking exams, honor pledges – each may have some use and be more appropriate in certain environments but this cannot be allowed to continue.

The future? COVID-19 has provided us with a terrific opportunity to revamp higher education offerings – but we need to put some serious thought (and dare I say it?) research into how we do this. We also perhaps need to sit back a little and reflect on what we have learned and how we can best use that knowledge.

3.4 Lessons from Transitioning between Academic Environments during COVID-19

The transition from a distance education university to a residential university during the COVID-19 pandemic provided a unique experience. Some context is necessary. The distance education university has a student population of about 450,000, while the residential university has about 50,000 students. The most notable difference is the age profile of the students. The ‘residential students' were in their early adulthood, on average 19-21 years of age, while the ‘distance students’ were quite older sometimes as old at 60 years. The distance students were mostly working professionals and hence had to be intentional about their study routines. The professions of the distance students were as varied as taxi driver, (not the Uber kind but the kind of taxi that transports 13-15 people usually from the outlying areas) to top executives. The role of the ‘distance academic’ is therefore much more focused on ensuring that distance students complete assigned tasks as efficiently as possible while offering content support when needed. Efficiency for the distance academic is more about ensuring that all content is uploaded on time and exactly as agreed in the study schedule. Any deviations, or attempted innovations to the predefined tasks are frowned upon by the distance students mainly because of the interruptions to their strict schedules.

Therefore, when the lockdowns began, the only changes were the location and the assessment approach for the distance academic and the distance student. The location was now from home, while the assessment approach changed from summative to continuous assessment. For some subjects, the continuous assessment approach was also in place and for those, only the location changed. The planning, curriculum development and the schedule remained the same. This meant that distance learning institutions were naturally better prepared and more resilient to the disruptions caused by the lockdowns.

Contrastingly, teaching at the residential University had moved from face-to-face to online. The online schedule was the same as that of face-to-face. It was however noticeable that the attendance of the online classes was often at about 25%. Some residential students joked that they would tune into the class and then go back to sleep. Trying to get active participation in the online classes was often a challenge. Some residential students had gotten themselves full-time jobs and would therefore watch the recorded sessions at their convenience. The residential university was working in a much more dynamic fashion and entrusted the academics to make the best decision on how to conduct their teaching and assessments.

With the above context, there are three observations that stood out from the dual experiences; there are mixed attitudes towards online/distance learning, online learning leaves a bigger digital trail, and the education sector missed a great opportunity for digital transformation and reform.

The first observation is that not all students appreciate online/distance learning. While some students prefer it, others loathe it. The low completion rate, even for free online content from the best institutions, is a testament to the differences in interest. Online/distance learning requires a greater deal of self-discipline.

The second observation is that online education allows for more access to data about student learning behavior, which can be linked to other academic performance and even individual characteristics. The digital trail created by online learning can allow for data analytics to be used to improve the teaching and learning experience. This provides an opportunity for academic staff to tailor their teaching to individual student needs and improve the overall learning experience.

The third observation was that academic professionals exhibited remarkable adaptability and readiness to implement changes to facilitate student learning, which speaks to their dedication as frontline staff in academic institutions. However, this adaptability stands in contrast to the institutional inertia that frequently besets these institutions. Despite the flexibility displayed by academics, academic institutions struggled to embrace change as the lockdowns eased. Instead, there seems to be a persistent push to revert to pre-pandemic norms with little consideration for the improvements that going online brought, nor considering important educational reforms. This raises the question of whether we missed a crucial opportunity to institute necessary changes in education.

3.5 Adapting to a Blend of Online and Face-to-Face Learning

There needed to be more clarity at a major South African public university set to commence classes in January 2022. The uncertainty centered around whether classes would be on campus or online, the duration of the classes, and the required expectations. Faculty members and administrators were constantly in flux, grappling with what steps to take next.

To give a feeling for the difficulties many were under and how some coped, consider a class of around 250 final-year students. Like many other universities, a partial return to campus was permitted but at reduced (30%) capacity. This module was scheduled as a two-hour lecture. Questions emerged, such as, "I've got this venue that can accommodate 60 students on a Friday afternoon". "I need to try and get 60 students into the class; who do I choose? Where do we start?" and "It's soft skills. How do we examine soft skills?" A larger venue was eventually located (due to other classes being moved online) but it could only accommodate 150 students according to the allowed capacity. Splitting the class in two meant that most of the students could attend one of the sessions, albeit only 50 minutes face-to-face. But it is difficult to reduce class teaching time by half. A different approach was called for and in this case the administration was willing to try alternatives. The module was thus changed to continuous assessment, also known as programmatic assessment (van der Vleuten et al., 2012), was the obvious choice, where various learning activities were introduced throughout the semester, 33 in total, taking away formal exams and tests. This approach, although not new, is undoubtedly a way for faculty to constantly evaluate students, whether online or in the classroom, to ensure students keep up to date and continually work through the necessary content, even after the pandemic has subsided. This meant considerable effort by the students in pre- and post- activities meaning they had to stay up to date with the class material for the whole semester – failure to complete the pre-activity meant no access to the post-activity. The activities included quizzes, video assessments, wikis, and reflective journals (a reflection of what you learned, so what, and now what), to name a few.

Student engagement became paramount. The class was enhanced by piloting the badging systems for the university, which was an excellent motivator for students. Students answered a survey with some of the following responses. "I loved attending classes on campus and then reading the articles" "I loved that each week we had pre-activities that helped ensure that I come to class prepared and ready to engage." "The continuous assessments and reflections. It helped ... think about what I learned and why." "Attending classes on campus and reading the articles [were helpful]." and lastly. "The interactive aspect of the module." The interactive aspect of the module was super engaging, it was enjoyable, and the activities were fun.

Asking what was not fun, "reaching the conflict point of the module was not fun, but it was necessary, and that was in the team." (A conflict topic that helped quite a bit is included in the class). "Too many assessments" on the one side as unfavorable and asking what they wanted to see in the future "more assessments." Underlining the suitability and relevance of this approach (at least for some) this email was received from a student to say thank you:

"First of all, I would like to thank you and the INF 315 team for making this module fun. We started the semester with contact lessons for the first time in 2 years, it was scary and daunting for all of us, but you made us look forward to coming to that Friday afternoon class and enjoying it. It was not easy, but your hard work and dedication to the module propelled us to give our best. I have always dreaded working in

teams, but as a result of this module, I was able to identify areas in which I can improve and benefit from working in a team. I looked forward to class even when I was battling depression and anxiety episodes on some days. It was a great escape for me mentally."

When bringing students back to campus, for how many of them will the above statement be similar?

Expanding the original discussion brought about another study, of which the panel members are all currently working on a distance learning in South Africa study. Below is a summary of responses from three questions from the study. It is relevant that of the respondents (450 from two South African universities) most students have never put their foot on campus. But we wanted to know how they feel about learning in the future, whether face-to-face or online.

- "When we're no longer required to do so, I will take distance learning classes in the future"; respondents split almost 50/50.
- "I feel burnt out from my online class activities." Most said they felt burned out (more than 62%) across the universities, spanning many faculties.
- Lastly, “In the future, when given a choice, I would rather NOT take classes online”. The majority said no (55%), and 10.82% did not agree or disagree. They want to come to campus and see their fellow students and their professors, the question remains, how are we teaching?

In retrospect, it’s evident that not all the latest technology features utilized in the programmatic assessment may be adopted going forward. Students had many emotions and perspectives on online teaching. Academics are tired and have exerted themselves mightily to ensure that education happens amidst the middle of a storm. However, we need to take note of the lessons learned from COVID-19 to ensure that it does not go to waste. We cannot have new innovative teaching methods, and when campuses open, we go back to lecturing in the “old” traditional fashion. We must adapt our teaching without retaking a 180-degree shift back to boring conventional classrooms. It is crucial to preserve the skills we acquired during the pandemic and not revert to the traditional classroom setting.

Our panel presentations identified some general themes – we have learned a lot and the lessons learned (summarized below) are not going away. We have seen an uneven playing field partly based on access to technology, socio-economic conditions, national infrastructure and student (and academic) abilities to cope. We have also seen problems around academic leniency and plagiarism. But we have also seen the introduction around the world of online education, albeit for the wrong reason. The question remains – where do we go from here?

3.6 Summary of Lessons Learnt

Our panelists shared several lessons that must be kept in mind as IS education moves into a (hopefully) post-COVID world. These are summarized below.

- The changes brought on by COVID-19 lead to challenges and opportunities.
- COVID-19 exposed inequities, especially related to technology access and infrastructure, and these must be addressed. These inequities were especially pronounced in developing countries, but were also present in developed countries.
- Most universities will expand digital learning opportunities, but additional investments beyond the emergency measures must be made.
- Standards that were relaxed during COVID-19 need to be re-instituted.
- Down-stream effects are and will continue to be significant.
- Student engagement is a persistent problem with distance learning.
- Some students will continue to take courses online and others will not.
- Students varied widely in their readiness for distance learning. Universities need to guide students towards the learning modality that best suits their needs.
- Universities missed an opportunity for educational reform.

4 Audience Questions and Insights

After the panelists finished their initial remarks, several audience members brought up additional points and issues, which were then discussed by the panelists. We provide an overview of these discussions in this section.

4.1 Need to Reorient Students to being on Campus

In many locations, including South Africa, students have been away from campus for much of the last two years. In fact, some students who left campus due to COVID-19 graduated without returning to campus. Returning students may have some difficulties in adjusting back to living and attending classes on campus. Because of this, universities may need to take steps to help students reorient to campus life and may also need to be sensitive to potential problems arising from adjustment difficulties. These problems are exacerbated by some of the downstream effects mentioned earlier. Students who graduated from their secondary schools and are now coming to campus may face additional challenges due to the year(s) of face-to-face learning they missed due to COVID-19 restrictions. These are important times in students' development and maturation. Universities need to be aware of the potential difficulties these students may experience and should prepare ways for students to make up for the important experiences they missed during COVID-19 restrictions. Although the scope of these problems varied across the different countries, with some universities only being off campus for a short time, and others for two years, all institutions should be aware of these potential problems and begin developing ways to alleviate the difficulties.

4.2 COVID-19 era Graduates Missing Important Skills

An attendee related that industry contacts had indicated that recent (COVID-19 era) graduates were weak in two important area – self-confidence and communication skills, both of which are important for professional success. Discussions with students found that many had not applied for post-graduation positions due to a lack of self-confidence. COVD-19 era students were thrust into a highly fluid, uncertain, unfamiliar situation. For some, the rapid, ongoing shift to online courses was upsetting and challenged their self-confidence. These students were used to a certain form of education and social interaction and were required to change rapidly to new methods of learning and interacting with little notice or preparation. It is hardly surprising that these circumstances led some to doubt their capabilities. Students vary widely in their abilities to effectively navigate and learn in distance learning environments. Students who were less suited to online learning may have found themselves less effective and performing below their standard. For these students, it is not surprising that self-confidence suffered.

Another factor that may have affected students' self-confidence is a fear of the unknown. Students (and all of us) had the proverbial rug pulled out from under them with practically no notice. Their worlds were disrupted suddenly and dramatically. So, it is only natural for them to wonder what might come next. For many, it is difficult to have a high degree of self-confidence when facing an uncertain, chaotic future. Their worlds changed in an instant, so how should these students think about their futures and what they should be doing to prepare themselves? These circumstances have left many students quite fragile. Universities must be aware of this and be prepared to help students deal with the anxiety brought on by their uncertain futures, and also to assist them in rebuilding their self-confidence.

Students also abruptly lost one of the major ways in which they learned and practiced effective face-to-face communication. Despite advances in digital communication technologies, many jobs still require considerable face-to-face communication. In face-to-face learning environments, students are able to develop their face-to-face communication skills. This opportunity was taken from them with the shift to online learning. Again, universities may need to provide programs and methods to help students gain (or regain) their face-to-face communication skills. Further, universities must recognize that not all students are well-suited to online learning and therefore should be careful when considering moving all sections of a course or entire programs online.

The burden for helping students and recent graduates overcome these difficulties is not the obligation of universities alone. Over the last few decades, many employers have abdicated much of the responsibility for workforce development to universities. Perhaps it is time for these employers to take on some of the burden of developing young people into effective professionals.

Despite the above, we should also recognize that students also gained many skills that they may not have otherwise. They have learned to operate in virtual environments; many have become skilled in using

advanced digital collaboration environments such as Slack. They may also have increased their ability to navigate the challenges of remote work. The workplace is being transformed to more flexible work arrangements. The current batch of students may be especially well positioned to operate effectively in virtual work environments.

4.3 Academic Integrity Challenges

The rapid shift to online learning seems to have brought about an increase in academic integrity problems. Attendees indicated that they have experienced notable increases in the use of “ghost-writing” services, and homework “tutoring” services such as Chegg.com, which makes solutions to many homework and test questions available to students (for a fee). In addition, advances in artificial intelligence have brought about services that provide AI-written responses to many essay questions and prompts. As has long been the case, students can be exceedingly clever in defeating academic integrity checks. For example, one attendee related that some students place white colored underscores between words to defeat plagiarism checkers. These underscore characters are not immediately apparent, being the same color as the document’s background. While ingenious, this demonstrates that faculty must go through extra effort to detect such methods.

Although academic integrity problems existed long before COVID-19, the shift to widespread online learning seems to have exacerbated the problem of using technology to cheat. Long term, this is not a viable situation. Universities that are unable to certify that students have met program learning objectives may lose credibility in the marketplace as graduates are unable to perform job duties. The increasingly capable analytics functions of some learning management systems may offer ways to more effectively detect academic integrity violations. Some universities have turned to more draconian methods. For example, a university in the Middle East (which was known to one of the panelists) brings all distance learning students to campus to take physically proctored examinations. Although not all universities will be willing or able to go this far, virtually all must find ways to effectively deal with the increasing array of highly effective cheating systems, services, and methods.

4.4 Limitations of Current Platforms

An attendee commented that some of our judgments about what is and is not working might be a function of the limitations of current generation of online learning platforms. Current systems have not implemented such capabilities as virtual and augmented reality. These technologies offer great promise for providing a much richer online learning experience. Attendees and panelists agreed that it is time to think “outside the box” to develop novel ways to use emerging technologies to enhance student learning and create a more engaged online learning experience. We must think beyond technology as a delivery method to develop innovative uses that enrich the learning environment. For example, educators may be able to leverage the metaverse to provide a more effective, engaged experience for students.

However, institutions need to be careful not to push faculty beyond their capabilities. Faculty are being asked to do more and more; adding yet another technology to learn and use may lead to increased faculty exhaustion and burnout. At some point, faculty may say “enough” and refuse new demands or simply leave the profession. Institutions must offer solutions can provide low-effort ways for faculty to make use of emerging technologies. Otherwise, many faculty may simply not have the time or energy to leverage the technologies’ capabilities.

We can align some of these comments with those made by the panelists. Table 2 shows these alignments.

Table 2. Topic Alignments

Topic	Audience insights
Digital Inequity	Students are missing some important skills. These may be especially pronounced for students that suffer from digital inequities.
Opportunities for change	
What is required of university administration	Administrations need to be proactive in helping reorient students to being on campus, and to helping students gain important missing skills. Coordinated responses to academic integrity challenges also requires administrative effort.
Technology is changing higher education	There are still numerous limitations to current platforms.
Social contact as part of the university experiences is important, indeed may be paramount for some	Students will need help in reorienting to campus.
Opportunities from more online: Attractive for some Expanded enrolments Cost saving	
Threats from more online: Faculty conditions Students engagement	
Need for a robust learning environment	There are still numerous limitations to current platforms.

5 Integration

Our discussion covered a wide range of topics. However, there are some high-level conclusions we can draw. We report these in this section.

5.1 The Future Remains Unclear

Will universities return to a pre-COVID "normal" or will there be lasting changes, leading to a "new normal"? If there are lasting changes, what will they be and what will be the consequences? Higher education remains in a state of uncertainty. There are arguments for embracing the digitization of teaching and learning, but exactly how to best utilize the new technologies and practices brought on by COVID-19 is an open question. Will IS education evolve, or will there be more of a revolution? Regardless, our panelists and audience members seem to believe that IS faculty should be prepared for potential changes, and more importantly be prepared for the challenges that come. Our panelists seem united in their belief that IS education will continue to embrace digital tools, although the extent to which this will occur is unclear. As a result, we believe that IS educators should not be passive actors but should actively advocate for changes that will benefit our students.

5.2 The Transition Back to "normal" will be Challenging

Transitioning back to campus will be challenging for many students, faculty, and institutions. Participants made frequent mention of some emerging challenges they are observing and experiencing. These ranged from burned out faculty to fragile students and uncertain university administration. For many, the "new normal" will not fully resemble the pre-pandemic normal. It is unclear whether university investments made in learning infrastructure will remain, especially if we continue to face economic challenges. Students and faculty have become used to great flexibility in when and where they learn and work. Going back to traditional, relatively rigid on-campus courses and work may be at odds with newly developed expectations and routines. Change is hard, even when the change is back to the way things used to be.

5.3 The Transition Exposed Long-standing Problems

The rapid transition to online learning exposed several inequities that had largely been under the surface. There are significant disparities in the extent to which students have access to the resources needed to fully participate in online learning. Institutions need to keep this in mind as they consider making online learning permanent for some courses and programs. As reported in this panel, this challenge may be

more pronounced in developing countries, but even in wealthy countries some students may lack access to basic technology resources such as high-speed, reliable Internet access and computers. Institutions and governments must work together to overcome these challenges. We can expect to see continued scrutiny and evaluation of teaching practices, support, and available technologies, particularly on socio-economic grounds. Innovations in technological products, services and business models will greatly determine the ability of governments and society to reduce the digital accessibility gap, just as it happens when mobile telephony allowed communication in areas where fixed lines were not available.

Similarly, students vary considerably in their fitness for distance learning – another constraint exposed and underlined by the pandemic. Universities need to be aware of these differences so that they may properly advise students who face the choice of online or face-to-face classes.

5.4 There are Positive Consequences and Opportunities

The transition brought on by the pandemic has a bright side. Students, faculty, and institutions were forced to become more well-equipped and adept at technology-mediated learning. Universities made huge investments in learning infrastructures, not only with respect to technology, but also in terms of support staff. In addition, many faculty put considerable time and effort into developing video lectures, online tutorials, and other technology-based learning activities. These investments may provide returns for years to come, but only if schools think strategically about how technology tools and distance learning fit into their institutions in the long run. Of course, many traditional institutions may try to simply return to the past rather than fully taking advantage of online and technology-mediated opportunities. Further, some administrations may fail to support ongoing investments in technology and personnel, which may hamper attempts to gain from the efforts put into the transition to online learning. Administrators and faculty should think carefully about how the knowledge gained during the pandemic can be applied for long term benefit. Universities should carefully consider whether it is worthwhile to continue to offer multiple course modalities. Flexibility is often beneficial, but it comes at a cost.

Some students may have become more comfortable with self-directed learning during the pandemic. They became more skilled in using technology to communicate and collaborate. Many students also became more comfortable with atomized learning, such as tightly focused YouTube-type tutorials. It remains to be seen if universities and faculty will adapt to and leverage these emerging ways of learning and interacting. It also remains to be seen if these new approaches enhance higher education.

In addition, students, faculty, and institutions may have become more resilient as a result of responses to the pandemic, but there is a wide variance in this resilience. Some individuals and institutions may be less resilient to rapid, large-scale changes. Leaders of these institutions would be well advised to work towards helping individuals and the organizations they lead become more resilient.

5.5 There may be Lingering Negative Consequences and Dangers

Although there may be bright spots from the pandemic transition, there are numerous dangers and negative consequences. The effects of the pandemic on students are extensive. Comments to this effect were common during our session. After extended times away from campus in relative isolation, we heard reports that students lacked good face-to-face communication skills. In addition, anxiety over an uncertain future seems to have sapped the self-confidence of returning students. There may also be significant learning gaps for incoming students who were in secondary education during the pandemic. Institutions may need to make significant investments in programs and services directed towards helping students overcome these limitations.

Another noteworthy challenge related to the return to some degree of normalcy concerns the leniency extended by faculty during the somewhat chaotic transition to online learning. It seems reasonable for administrators to call for, and in some cases, require such leniency. But it is important to return to a higher level of rigor. Being overly lenient does our students no favors; their education will suffer if we fail to enforce proper standards. This situation will be especially troubling during the transition back to campus. It is likely that there will be a wide range of leniency (even wider than normal), which is disadvantageous for faculty who attempt to return to pre-pandemic standards.

This will only add more burden to already taxed faculty. As institutions attempt to leverage the investments made in technology-based learning, they may make excessive demands on faculty, for example by requiring multiple modalities, or enhanced use of learning management systems. Administrators must be careful to not overload faculty to the point that they burn out and possibly leave the academy. Besides

offering new courses in new and varied modalities, some faculty will gain experience and knowledge in online education models rather than simply recreate their classes in a virtual environment. This will be a significant and lengthy process.

6 Research Agenda

Several research questions were inspired by our discussion. This list is not exhaustive, of course, but is intended as a starting point for researchers who are interested in better understanding the topics touched on in this report.

- What factors will affect students' preferences for online, face-to-face, and hybrid courses? This question has been researched, but we are entering a new environment in which there may be extended options within traditional institutions. In addition, students have been exposed to online learning due to the pandemic. Their experiences may affect their preferences.
- Are faculty experiencing work overload and burnout due to increasing workloads brought on by technology-mediated learning? If so, what are the long-term consequences? Anecdotally, faculty report increased workloads due to administrative pressures to further adopt technology-mediated learning in their face-to-face courses, and to provide multiple learning modalities. So, it is important to understand the extent to which this is occurring and the effects on faculty.
- How effective are programs and interventions aimed at helping students overcome learning and skills gaps caused by the pandemic? Students face numerous challenges as we return to campus. Universities are putting programs in place to help students overcome these challenges. It is important to understand the effectiveness of these programs.
- What improvements are necessary or desirable in the further development of LMS? Promotion of student engagement, better communication tools, a more robust learning and assessment environment all appear to be in need of further work?

We believe that these questions can be adapted to other contexts that use technology to mediate interactions. Taking that perspective, we see several broader questions and issues that flow from our discussion and agenda.

- How do experiences during significant societal or organizational disruption affect ongoing behaviors and practices after a return to relative stability? The extent to which COVID-19-induced preferences, attitudes, and practices will endure over the long term remains open. This issue pertains not only to distance education but also to other information systems applications. Examples include video conferencing, telehealth, electronic government, touchless and mobile payment systems, and public health surveillance. Understanding the persistence of emergent factors may require more nuanced views than simply considering applications and systems as monoliths. For example, considering affordances (CITE) may allow us to understand the potential for long-term changes better. Telehealth serves as an example. Patients may favor telehealth for routine care, such as dealing with seasonal allergies or the flu, but may seek traditional face-to-face care for more severe or unusual cases.
- How do disruptions and their aftereffects affect humanistic factors related to technology use? The ongoing human costs of COVID-19 are enormous. We see at least two major ongoing implications that should be considered by information systems researchers, the future of work and the mitigation of technology-related stress. These two factors are not unrelated. Some ways in which COVID-19 affected the future of work are relatively clear. For example, the rise in remote and hybrid work is unlikely to completely reverse. In addition, many organizations turned to automation to deal with COVID-19 restrictions and related labor shortages. The rapid increase in the capabilities of artificial intelligence (AI) will likely accelerate this trend. Information systems researchers should not only investigate how organizations can strategically and ethically implement automation but should also consider the effects of increased automation on information systems professionals. As AI increases in capabilities, it is likely that the nature of information systems work will change dramatically. This may affect how new information system workers enter the profession. Researchers should examine the extent to which this is happening and how the field should evolve as a result. AI-human partnerships are also likely to increase. This raises

many interesting issues, including the humanistic impacts on workers. Will AI become our trusted partners or our overlords?

- How can organizations understand and adapt to skill shifts and gaps brought on by disruption? COVID-19 brought serious skill challenges for organizations and individuals. For example, many workers needed to adapt their communication skills to account for new ways of interacting at a distance, such as video conferencing and group communication systems (e.g. Slack and Discord). This raises several issues, including how these gaps can quickly be identified, how to help workers gain new skills quickly and effectively, and how to determine the appropriate investments in what may ultimately be temporary skill needs. Over the longer term, organizations may need to consider ways to mitigate potential skill gaps related to COVID-19. As noted earlier, some students suffered significant skill deficiencies due to COVID-19 and these may not be completely made up when they enter the workforce. On the other hand, one should caution against increasing the skills gap using technology, which could widen the skills gap even further. The changes prompted by COVID-19 and the rise in AI will likely lead to the need to upskill and reskill workers. Information systems can help organizations monitor and deal with these changes, but further research is needed to determine the best ways to accomplish reskilling and upskilling in ways that are both ethical and effective. An important ethical aspect related to skills concerns whether negative effects will disproportionately affect particular social groups.
- How should we adapt our theories in light of abrupt societal disruptions? Times of disruption offer opportunities to reconsider our core theories. Although information systems research has theories that are appropriate for studying disruption, these tend to be focused on individual organizations, industries, or markets. COVID-19 was a severe example of a societal disruption. For example, punctuated equilibrium (mentioned earlier) may need to consider accelerated punctuation as a special case that may bring about different effects, such as more chaotic returns to equilibrium. In addition, we should consider how abrupt societal disruptions act as boundary conditions for our traditional theories. Consider traditional theories of adoption and acceptance, such as the Technology Acceptance Model, Unified Theory of Acceptance and Use of Technology, and Diffusion of Innovation theory predict that certain beliefs and attitudes are the main determinants of technology acceptance, adoption, and use. The predictions and explanations provided by these theories may not hold in times of widespread, dramatic disruptions. Researchers should consider what aspects of external events serve as the specific boundary conditions. For example, organizations faced few viable alternatives for continuing operations during severe COVID-19 restrictions. Perhaps the lack of available options may be a boundary condition for traditional theories. Virtually any information systems theory that considers the impacts of attitudes and beliefs may be a viable candidate for reconsideration. There is also a need to develop theories that can help us understand disruptions in the moment. Retrospective examinations and explanations of what has happened are useful, but theories may need to be developed to help organizations better understand the effects of disruptions as they occur. We should also look to the field of futures studies for methodologies that can be used to forecast potential future disruptions and their effects.

7 Conclusions

The COVID-19 pandemic disrupted higher education to an extent never before experienced. As we return to some semblance of normal, many questions remain regarding the role of online courses, technology-mediated learning resources, and the long-term effects of the pandemic on students, faculty, and institutions. Our panel discussion explored many of these questions and drew several conclusions regarding the challenges, opportunities, and lingering effects of COVID-19 on higher education.

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References

Barton, A. J., Murray, T. A., & Spurlock, D. R. (2020). An Open Letter to Members of the Nursing Education Community. *Journal of Nursing Education*, *59*(4), 183.

Biden, J. R. (2021). Remarks by President Biden Announcing the Framework for His Build Back Better Agenda and Bipartisan Infrastructure Bill [Press release]. Retrieved from https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/10/28/remarks-by-president-biden-announcing-the-framework-for-his-build-back-better-agenda-and-bipartisan-infrastructure-bill/

Camilleri, M. A. (2021). Evaluating service quality and performance of higher education institutions: A systematic review and a post COVID-19 outlook. *International Journal of Quality and Service Science, 13*(2), 286-281.

Clary, G., Dick, G., Akbulut, A. Y., & Van Slyke, C. (2022). The After Times: College Students' Desire to Continue with Distance Learning Post Pandemic. *Communications of the Association for Information Systems, 50*. p. https://doi.org/10.17705/1CAIS.05003

D'Agostino, S. (2022). Consolidating Campuses, Reconceptualizing Workspaces. *INSIDE Higher Ed.* Retrieved from https://www.insidehighered.com/news/2022/07/29/building-sale-remote-work-helped-pa-system-redesign#.YvSWWXLVCBE.link

Dennis, M. (2020, 6 May 2020). Higher education opportunities after COVID-19. Retrieved from https://www.universityworldnews.com/post.php?story=20200507152524762

Dick, G., Akbulut, A. Y., & Matta, V. (2020). Teaching and learning transformation in the time of the Coronavirus crisis. *Journal of Information Technology Case and Application Research, 22*(4), 243-255.

Dick, G. (2021) "Teaching Online: Creating Student Engagement" *Communications of the Association for Information Systems 48, https://doi.org/10.17705/1CAIS.04809*

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.

Dorn, E., Hancock, B., Sarahatsannis, J & Viruelg, E. (2021). COVID-19 and education: The lingering effects of unfinished learning, McKinsey & Company Report, https://www.mckinsey.com/industries/education/our-insights/COVID-19-and-education-the-lingering-effects-of-unfinished-learning.

Elfirdoussi, S., Lachgar, M., Kabaili, H., Rochdi, A., Goujdami, D., & El Firdoussi, L. (2020). Assessing Distance Learning in Higher Education during the COVID-19 Pandemic. *Education Research International, 2020*, 8890633.

Frost, R. (2021). Stealth theory through instructional scaffolding in the COVID-19 era and beyond. *Communications of the Association for Information Systems*, *48*(1), 2.

García-Morales, V. J., Garrido-Moreno, A., & Martín-Rojas, R. (2021). The Transformation of Higher Education After the COVID-19 Disruption: Emerging Challenges in an Online Learning Scenario. *Frontiers in Psychology, 12*.

Gersick, C. J. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of Management Review*, 16(1), 10-36.

Gilbert, C. G. (2005). Unbundling the structure of inertia: Resource versus routine rigidity. *Academy of Management Journal*, 48(5), 741-763.

Kandri, S. (2020). How COVID-19 is driving a long-overdue revolution in education. Retrieved from https://www.weforum.org/agenda/2020/05/how-COVID-19-is-sparking-a-revolution-in-higher-education/

Lockee, B. B., & Clark-Stallkamp, R. (2022). Pressure on the system: increasing flexible learning through distance education. *Distance Education*, 43(2), 342-348.

Martin, M., & Furiv, U. (2020). COVID-19 shows the need to make learning more flexible. Retrieved from https://www.universityworldnews.com/post.php?story=20200324115802272

Martínez-Pérez S. & Rodríguez-Abitia G. (2021) A Roadmap for Digital Transformation of Latin American Universities. Chapter in: Burgos D., Branch J.W. (eds) Radical Solutions for Digital Transformation in Latin American Universities. Lecture Notes in Educational Technology. Springer, Singapore. https://doi.org/10.1007/978-981-16-3941-8_2

Mantere, S., Schildt, H. A., & Sillince, J. A. (2012). Reversal of strategic change. *Academy of Management Journal, 55*(1), 172-196.

Orlikowski, W. J. (1996). Improvising organizational transformation over time: A situated change perspective. *Information Systems Research*, 7(1), 63-92.

Rodriguez-Abitia, G. (2021). Coping with COVID-19 in Mexico: Actions for Educational Inclusion. *Communications of the Association for Information Systems*, 48.

Sarker, S., Chatterjee, S., Xiao, X., & Elbanna, A. (2019). The sociotechnical axis of cohesion for the IS discipline: Its historical legacy and its continued relevance. *MIS Quarterly*, 43(3), 695-720.

Schaeffer, K. (2022). In CDC survey, 37% of U.S. high school students report regular mental health struggles during COVID-19. Coronavirus Disease (COVID-19). Retrieved from https://www.pewresearch.org/fact-tank/2022/04/25/in-cdc-survey-37-of-u-s-high-school-students-report-regular-mental-health-struggles-during-covid-19/

Statistitics South Africa (2021). *General Household Survey 2020*. http://www.statssa.gov.za/publications/P0318/P03182020.pdf

Sydow, J., Schreyögg, G., & Koch, J. (2009). Organizational path dependence: Opening the black box. *Academy of Management Review*, 34(4), 689-709.

Tripsas, M., and Gavetti, G. (2000). "Capabilities, Cognition, and Inertia: Evidence from Digital Imaging," *Strategic Management Journal* (21:10/11), John Wiley & Sons, pp. 1147–1161. (http://www.jstor.org/stable/3094431).Van der Vleuten, C.P.M., et al., *A model for programmatic assessment fit for purpose.* Medical Teacher, 2012. **34**(3): p. 205-214.

UNESCO (2020) "1.3 billion learners are still affected by school or university closures". Retrieved from https://en.unesco.org/news/13-billion-learners-are-still-affected-school-university-closures-educational-institutions.

Van Slyke, C., Clary, G., & Tazkarji, M. (2022). Distress, Eustress, and Continuance Intentions for Distance Learners. *Journal of Computer Information Systems*, 63(1), 149-161.

Van Slyke, C. V., Dick, G., Case, T., & Ilie, V. (2010). The importance of compatibility and pressure on intentions to engage in distance learning. *Communications of the Association for Information Systems*, *27*(1), 22.

Wang, Q., & Huang, R. (2021). The impact of COVID-19 pandemic on sustainable development goals - A survey. *Environmental research, 202*, 11637.

Weldon, A., Ma, W. W. K., Ho, I. M. K., & Li, E. (2021). Online learning during a global pandemic: Perceived benefits and issues in higher education. *Knowledge Management & E-Learning: An International Journal, 13*(6), 161.

Zheng, Q., Lin, X., He, L., Freudenreich, T., & Liu, T. (2021). Impact of the Perceived Mental Stress During the COVID-19 Pandemic on Medical Students' Loneliness Feelings and Future Career Choice: A Preliminary Survey Study. *Frontiers in Psychiatry, 12*, 666588.

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