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Special Section: COVID-19, Learning, Pedagogy, and Educational Systems

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Special Section: COVID-19, Learning, Pedagogy, and Educational Systems

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Abstract:

In March, 2020, the coronavirus disease of 2019 (COVID-19) pandemic affected the information systems (IS) higher education community (along with the rest of the world) profoundly. Higher education institutes across the world had to quickly shift to online courses. In some cases, faculty had to transition their courses in only days. In response, the *Communications of the Association for Information Systems* launched a special issue on COVID-19, learning, pedagogy, and educational systems to provide a forum for IS faculty around the world to share effective practices and opinions regarding the long-term consequences of the COVID-19 pandemic on IS education. This paper serves as the editorial for the special issue.

Keywords: Information Systems Education, Distance Learning, Online Learning, Higher Education.

This manuscript underwent editorial review. It was received 01/13/2021 and was with the authors for zero months for zero revisions. Fred Niederman served as Associate Editor.

¹ The authors of this paper were co-editors of the special section. All co-editors contributed equally throughout the process of putting together this special section.

1 Purpose of the Special Section

The coronavirus disease of 2019 (COVID-19) pandemic changed the world abruptly and (possibly) irreversibly. Higher education has not escaped the pandemic's impacts with virtually all institutions first making mid-term shifts to delivering courses online and now facing the ongoing questions about the right delivery mode portfolio to adopt. In some cases, faculty had to adapt their courses in as few as two days. Although initially jarring and challenging, the adaptation has the potential to ultimately strengthen information systems (IS) education as new, effective practices and ways of thinking emerge. At the same time, the rapid shift may have exposed broader ethical and practical challenges that we need to address.

This special issue provides faculty around the world an opportunity to share experiences and lessons to help transfer knowledge in our community and, perhaps, beyond. As often occurs during significant disruptions, the need to cope with new realities led to significant learning among IS educators. As a result, we formed this special section to provide a forum for capturing and presenting this learning to the IS education community. We all learned from our experiences, but our learning depended on our individual circumstances. The special section gives IS educators a vehicle for transferring our individual learning to expand our collective knowledge.

The special section grew out of conversations between Fred Niederman (then incoming *CAIS* Editor-in-Chief) and Craig Van Slyke. The conversations indicated a clear need for knowledge sharing among IS faculty, virtually all of whom faced significant teaching challenges due to the changes that the COVID-19 pandemic created. Niederman and Van Slyke subsequently invited Mary. J. Granger and Heikki Topi to serve as co-editors for the special section.

The special section sought papers that could provide insights related to all aspects of the complexity the COVID-19 pandemic brought to the IS education community. The special section call for papers invited faculty to submit relatively short and timely papers that would likely provide immediate value to the community. We sought papers in two categories: 1) practice papers and 2) opinion papers. Practice papers focused on sharing effective and useful practices that IS faculty could adapt and adopt to help meet teaching challenges during the time of COVID-19 uncertainty. Opinion papers addressed broader issues that the pandemic created or exacerbated. We received overwhelmingly more practice than opinion papers.

We received 65 submissions and accepted 28. We asked that practice papers:

- 1) Clearly describe the problem, challenge, or opportunity
- 2) Describe the practice in sufficient detail to allow other faculty to adapt and apply the practice to their context
- 3) Reflectively discuss the author(s) experiences, and
- 4) Provide a "lessons learned" section.

Unfortunately, the COVID-19 crisis will not likely be the last situation that will require institutions and IS faculty to react quickly to emergencies. As a consequence, schools and universities, IS departments, and IS faculty need to develop agility with respect to their programs and courses. We very well may be called on again to shift how we teach on short notice—we need to be up to the task. The special section provides a repository of opinions, guidance, and examples of how we, as IS educators, can be ready when the next disruption arrives.

2 Review Process

We had a tight timeline for the special section. We circulated the initial call for papers on 17 June, 2020, with submissions due 15 July, 2020. We sent first-round review notifications to authors in many cases in less than a month and for all by 15 September, 2020. We decided to release accepted papers in batches rather than wait until all we processed them all². Doing so meant we could more rapidly share effective practices and take advantage of the electronic publishing model that *CAIS* follows.

CAIS editorial board members and one special section editor peer reviewed all papers (see below). A total of 65 papers were submitted and 29 were ultimately accepted and have been published. Three papers met

²We also completed this editorial in phases. The first two sections were published with the initial batch of papers.

established requirements, but the need for extensive revision beyond the time available were requested to submit to the regular CAIS IS education department. We intentionally provided development reviews as we sought to make good ideas publishable rather than to primarily serve as gatekeepers in the initial review round. Due to the aggressive timeline, we expected reviewers to complete reviews within two weeks of the review request. The production process for accepted papers began shortly after acceptance with a goal to make papers available as quickly as was feasible.

We used atypical criteria when making acceptance decisions. We primarily focused on accepting papers that provided value to the IS education community. We cared less about precision than value. Due to the context in which authors developed these papers, they typically did not constitute theory-driven papers but relied on practical experience with, in many cases, support from prior literature. In many cases, the value comes from practical advice or insights that IS faculty can rapidly apply to their own situations. In other cases, the value comes from how they shift our thinking about broader issues. The papers represent a broad array of issues that range from specific techniques to broader societal issues. In all cases, as our overarching consideration, we considered whether we thought the paper carried sufficient value for the global IS education community to merit inclusion.

The review process and aggressive timeline required extraordinary efforts from the editorial review board (ERB) members. We publicly thank them for their contributions. The review board included leaders in the IS education community, such as members of the Association for Information Systems (AIS) Special Interest Group on Education, and education track chairs of AIS conferences. The ERB represented all AIS regions. We list the members in Table 1.

Table 1. Editorial Review Board

Name	Affiliation	Name	Affiliation
Toon Abcouwer	University of Amsterdam	Roderick Lee	Penn State University—Harrisburg
Asli Akbulut	Grand Valley State University	Yaojie Li	Columbus State University
Hala Annabi	University of Washington	Alan Megargel	Singapore Management University
João Alvaro Carvalho	Universidade do Minho	Jeff Merhout	Miami University
Tom Case	Georgia Southern University	Alanah Mitchell	Drake University
Yan (Mandy) Dang	Northern Arizona University	Meg Murray	Kennesaw State
Carina de Villiers	University of Pretoria	Raymond Papp	University of Tampa
Geoff Dick	St. John's University	Jeff Proudfoot	Bentley University
Selwyn Ellis	Louisiana Tech University	Guillermo Rodríguez-Abitia	Universidad Nacional Autónoma de México
Wafa Elgarah	Al Akhawayn University	Jan Seruga	Australian Catholic University
Evren Eryilmaz	California State University, Sacramento	Venky Shankararam	Singapore Management University
Lee Freeman	University of Michigan—Dearborn	Jun Shen	University of Wollongong
Mark Frydenberg	Bentley University	Janice Sipior	Villanova University
Raymond Frost	Ohio University	Gary Spurrier	University of Alabama
Alexandre Graeml	Universidade Tecnológica Federal do Paraná	Riana Steyn	University of Pretoria
Monica Garfield	Bentley University	Rhonda Syler	University of Arkansas
Haijing Hao	Bentley University	Mark Thouin	The University of Texas at Dallas
Al Harris	Appalachian State	Craig Tyran	Western Washington University
Ann-Therese Hedqvist	University West	Andrew Urbaczewski	University of Denver
Blake Ives	University of Houston	Wendy Wang	Trident University
Lakshmi Iyer	Appalachian State	Elizabeth White Baker	Virginia Commonwealth University
Blooma John	University of Canberra	Jennifer Xu	Bentley University
Lesley Land	University of New South Wales	Jae Ung (Jake) Lee	Louisiana Tech University
Sven Laumer	Friedrich-Alexander Universität		

3 Paper Synthesis

The papers accepted for the special issue deal with many different outcomes of the transition to remote learning. Since we cannot feasibly summarize all the papers due to their number, we identify the main issues that the papers address and provide a table (see Table 2) in which we connect the issues with the papers that tackle them. While some papers focus on specific courses, others apply to online programs more broadly and other remote learning contexts. The importance of communication skills—both for faculty and students—represents one pervasive theme that flows throughout the special issue.

The most common concerns included keeping students engaged in the learning process, treating students fairly, and including all students in remote learning contexts. These items ranged from country-specific issues to universal themes, such as insufficient technology and challenges for students with disabilities, and concentrated on the availability of hardware, bandwidth, special software, and appropriate learning spaces. Other important topics included team projects and instructional methods. Every IS curriculum contains team projects, which both created additional challenges for the online environment but also provided students with a realistic view of how globally distributed teams work even without the pandemic. In this context, too, faculty adapted and continued to facilitate student learning despite the difficulties. Faculty experimented with different teaching practices and methods in that they often incorporated what worked in the traditional setting and then make adjustments spontaneously. We felt delighted to see that authors reported both their successes and their disappointments related to team projects, pedagogy, remote technology, and other elements that they faced in transitioning remote learning.

Although the papers build on the authors' experience with the rapid transition to remote learning, each paper analyzes broader lessons learned during the transition that apply to various contexts. These experiences will continue to be beneficial both when we return to the classroom and see students again and when we face potential future disruptions. Furthermore, the papers in the special section can help IS faculty determine lessons from this difficult time that they can use to find new ways to facilitate students' learning in an effective, efficient, fair, and equitable way.

Table 2. Main Paper Themes and Authors

Categories	Authors
Academic integrity	Goldberg (2021)
Active learning/peer learning/flipped classroom	Connolly & Mutchler (2021), Li et al. (2021), Olsen (2021)
Analytics course	Gottipati & Shankararaman (2021), Williams & Elmore (2021)
Capstone course	Stahr & Davis (2021)
Digital divide: equity and inclusion	Prinsloo & Singh (2021), Zha & He ((2021), Li et al. (2021), Rodríguez-Abitia (2021), Singh, Sharma, & Gupta (2021), McCarron (2021), Hvalshage, Nittala, Raman, Sullivan, & Zolbanin (2021), Chapman & Iyer (2021)
Faculty concerns/productivity	AbuJarour et al. (2021), Dunnaway & Kumi (2021), Barber (2021), Sullivan, Raman, Zolbanin, Nittala, & Hvalshagen (2021), Stahr & Davis (2021)
Method/practice/pedagogy	Chen & Roldan (2021) Frost (2021), Toney et al. (2021), Dick (2021), Dunnaway & Kumi (2021), Singh, Sharma, & Gupta (2021), McCarron (2021), Raman et al. (2021), Barber (2021), Mavengere et al. (2021), Abcouwer, Takács & Solymosy (2021)
Programming course	Connolly & Mutchler (2021), Goldberg (2021), Li et al. (2021)
Required IS course	Williams & Elmore (2021), Prinsloo & Singh (2021)
Specific course—diverse	Chen & Roldan (2021), Frost (2021), Drechsler (2021), Mavengere et al. (2021)
Student engagement	Connolly (2021), Toney, Light, & Urbaczewski (2021), Dick (2021), Dunnaway & Kumi (2021), Olsen (2021), Raman et al. (2021), Haslam, Madsen, & Nielsen (2021), Drechsler (2021), Przbilla (2021), Mavengere et al. (2021)
Teams	Chen (2021), Toney, Light, & Urbaczewski (2021), Zha (2021), Li (2021), McCarron (2021), Haslam (2021), Drechsler (2021), Przbilla, Klinker, Kauschinger, & Krcmar (2021), Raman et al. (2021)

4 Issues for the Future of IS Education

The submissions to the special section raised several high-level issues that we believe warrant further discussion. Accordingly, we discuss them in this section. Note that our comments may not draw directly from the papers in the special section, but the papers nonetheless inspired them. Also note that the comments in this section refer to our collective view and may not represent our respective universities' or the Association for Information Systems' position.

4.1 Ethical Issues

The papers in the special section raise several important ethical issues. We focus on two related ethical perspectives: 1) the digital divide and 2) equity, inclusiveness, and justice. First, although information technology and the Internet seem ubiquitous in our digitally driven world, many students and faculty members lack high-quality, reliable information technology and Internet access. Several special section papers deal directly with issues related to the digital divide, while several others deal with these issues tangentially. Interestingly, these papers come from authors in different countries, including India, Mexico, South Africa, and the United States. Although researchers commonly speak about “the” digital divide, multiple digital divides exist (Tsatsou, 2011). Three papers in the special section deal with the digital divide related to the lack of access to adequate information technology. Citizens in many developing countries use mobile phones as their primary (sometimes only) device to access the Internet. Although one can use mobile phones for many purposes, they may not strongly suit online learning activities, such as assignments and exams. In addition, data usage may be relatively expensive, which may limit access to learning materials such as instructor videos.

Access issues also exist in developed countries. For example, despite initiatives by both the Obama and Trump administrations, people who live in remote areas in the United States often cannot access affordable and reliable high-speed Internet access. Furthermore, such access in these areas costs relatively more than elsewhere in the country and has data caps. In some areas, satellite Internet access—expensive, slow, and unreliable compared to the options in more densely populated areas—constitutes the only alternative. Typically, the more affordable satellite Internet access plans have strict data caps. When one exceeds these caps, the service provider may throttle one's download speeds, which inhibits one's access to such services as streaming lectures. This digital divide disadvantages the rural poor in particular. Although urban and suburban citizens typically have better and lower-cost options for Internet access, some may not be able to attain these services as well.

While the digital divide represents an important issue “normal times”, the problem became much worse for many students (and some faculty) when schools and universities moved online in response to the COVID-19 pandemic. For some college students, the restrictions meant leaving campus with its reliable, convenient, high-speed Internet access and returning home where they lacked reliable, quality access. Students who now had to share bandwidth (and potentially limited quiet spaces at home) with siblings and parents who also had to take classes or work online worsened the problem. Administrators and faculty should keep these issues in mind and make allowances for students who must take online classes despite their lack of suitable Internet access.

Another aspect of the digital divide concerns technology skills (van Deursen & van Dijk, 2015). Despite the thinking that many college students today are digital natives, many lack the ability to perform seemingly basic operations such as creating PDF files. Not only will they struggle with remote learning, students who have not experienced technology before reaching the university may have even fewer IT skills and encounter greater difficulty with the new learning environment. Accordingly, faculty and administrators should not assume that students have sound technology skills.

An interesting emerging element of digital divides concerns the availability of physical space suitable for accessing and engaging with course materials. Singh et al. (2021) address this issue directly in the Indian context in this special issue, but the physical space problem exists for many students no matter where they live. Again, the need for students to return home and share physical space with their siblings and parents exacerbates this issue. Less economically advantaged students will likely experience physical space challenges at a higher rate than their financially well-off peers. The intersection of digital divides and economic challenges sheds light on problems about equity and justice, which we discuss below.

As we note above, equity and inclusion form another major ethical challenge that many special section papers discuss. In most cases, these papers observe that the pandemic's affected students' learning

experience and outcomes differently depending on several factors that, in practice, the students could not control. Some papers took a country-specific perspective (such as Rodriguez-Abitia (2021) with a focus on Mexico and Singh et al. (2021) on India) but still recognized that the challenges are universal. Several papers that emphasized equity and inclusion identified a direct link between these challenges and a large existing body of literature on the digital divide (e.g., van Dijk, 2020) and other topics (such as healthcare; see Ramsetty and Adams, 2020). Even though the papers in the special section do not directly address diversity, the challenges related to equitable access also affect the success of long-term but still fragile (Barr, 2017) efforts to ensure that IS degree programs attract students from diverse backgrounds.

The papers with an equity and inclusion focus clearly demonstrate the concrete and practical issues that prevent equal access to education in both normal and times that feature major disturbances such as the COVID-19 pandemic. Singh et al. (2021) discusses the impact that available physical space(s) have on students' studies and the clear inequalities in students' access to the. Hvalshage et al. (2021) go beyond physical space and show how family dynamics and expectations can more broadly affect a student's learning experience negatively. The availability of and access to technical infrastructure remain major challenges (Prinsloo & Singh, 2021, Rodriguez-Abitia, 2021). Students with special needs remain particularly vulnerable (Li et al., 2021) and require accommodations that, in many contexts, the law mandates.

4.2 Institutional Issues

The COVID-19 pandemic and associated responses also brought several institutional issues to the fore. One fundamental issue that universities will confront for some time to come concerns the distinction between the educational experience and the residential experience. One area of great concern for universities—and, frankly, one driving force behind many decisions to resume face-to-face classes—concerns the need for housing revenue. Many schools have fixed expenses related to housing and residential student services—these expenses continue whether or not there students actually live on campus. Students often care more about the on-campus experience than the specific discipline or program they choose, and universities have increased their offerings to attract such students. Food courts and well-appointed exercise facilities come at a high price. These and other fixed costs combined with enrollment declines put some schools in precarious financial positions. Poorly resourced colleges may not survive. In situations where students no longer use these high-cost ancillary facilities, should administrators question their relevance and reassess their universities' goals?

The pandemic has also exposed a serious lack of discretionary resources in many schools (and IS departments) due to long periods of shrinking or stagnant budgets. While the lack of financial reserves represents a serious problem, we lack the scope here to discuss institutional budgets. Here, we focus more on the shortage of human resources. Even before the pandemic, many IS departments ran with few faculty such that they almost reached the breaking point. That leanness has led to single points of failure for specialized courses. In a pandemic, this situation becomes even more tenuous. In a pandemic, this situation becomes tenuous. Adjunct faculty whom many IS departments employ to address faculty shortages may not wish to expose themselves to COVID-19 by coming to campus or may be reluctant to take on the considerable work involved in shifting to an online class. As a result, some IS departments may lack qualified teaching faculty. Older faculty who have a higher risk of serious complications from COVID-19 may decide to retire rather than risk their health. Hiring freezes may mean that IS departments cannot replace retiring faculty (at least in the near term). Indeed, some schools may not survive due to the pandemic's effects.

IS courses may also be especially vulnerable to the consequences from overtaxed IT support staff. Many IS courses include hand-on components that require specialized software. Often, IS faculty rely on IT support staff to install and maintain this special software in labs or on classroom computers. Students may need IT specialists to configure their laptops and set up the Internet connection and use specialized software that one cannot easily install on individual machines. At some universities, tuition includes a fully equipped computer, and students receive a computer when they come to campus. Schools may have a dedicated department to assist students and faculty with these issues. The rapid shift to distance learning has often required IT specialists to deal with additional technological challenges. Campus closing also meant that IS faculty had to find new ways for students to access necessary software, such as through virtualization. Such efforts require IT staff members' attention. Despite the increased demand for IT support services, few schools could add or retain IT specialists due to budget uncertainties. As a result,

they could sometimes not prioritize IS faculty's and students' needs, which compromised IS curriculum content.

However, the pandemic has had positive institutional effects as well. For instance, it may have overcome institutional inertia related to many opportunities for transformation. Few who have spent any time in higher education have failed to hear the words "We've always done it that way". The COVID-19 response proved that higher education institutions can, in fact, change quickly and (arguably) effectively. As one can see from the papers in this special section, faculty constitute an innovative, agile lot. At least for these papers' authors, the image of tradition-bound, staid faculty who resist any change simply lacks validity. These faculty and many others rose to the challenge and found new ways to help their students learn effectively amid a turbulent pandemic. They willingly innovated and experimented for their students' benefit.

Of course, not all these experiments worked as intended. Some faculty certainly failed, but, as the "lessons learned" sections in the papers indicate, they critically reflected on their efforts and the results they brought about and used such reflections to improve for the future. (In fact, the special section papers' authors acknowledged their failures more willingly than most and, thus, have contributed significantly to our opportunity to learn as a community.) We hope that universities' response to the pandemic will result in a higher tolerance for what one might call smart failures—well-reasoned trials that simply did not work out. Innovation requires a willingness to fail. Perhaps the pandemic will finally teach faculty that we can fail as so long as we see that failure as a step on the path to new, useful, effective educational practices. However, whether this agile mindset will endure long term or we will return to our old inertia remains to be seen. In short, we hope that higher education's response to the COVID-19 pandemic will result in a lingering thirst for experimentation and a tolerance for failure.

4.3 The IS Discipline

What lasting effects will the COVID-19 pandemic and the responses to it have on the IS discipline? One positive impact concerns the fact that the responses to the pandemic clearly demonstrate the value of information systems and information technology. For the foreseeable future, when we need to demonstrate the IS discipline's relevance to students in introduction to IS classes, we will only need to say: "remember COVID?".

Although it seemed like the world ground to a halt in early 2020, it only briefly paused before organizations turned to information systems and information technology to continue their operations. According to National Center for Education Statistics (n.d.), 64.7 percent of postsecondary students in the United States had never taken a distance education course in 2018. That percentage dropped to almost zero when the pandemic began. Universities (and many other organizations) would have had to shut down without the information systems and technologies that enabled distance learning and telework. E-commerce experienced huge gains. Video conferencing became the norm (even for virtual happy hours). In short, the world relied on information systems and technologies in a way it never had before—what else could more clearly demonstrate the IS discipline's value?

In this context, the IS discipline provides organizations that operate in an extreme distributed mode (i.e., few if any staff members work on company premises) with specialized expertise about 1) understanding how to manage data and integrate data into organizational systems and 2) integrating both traditional and emerging technology resources into systems that enable an organization's core structure and functions. Compared to other computing disciplines (computer engineering, computer science, cybersecurity, information technology, software engineering, data science), statistics, operations management, and other disciplines that have an interest in applying quantitative approaches to organizational problems and opportunities, the IS discipline focuses on the integrative systems perspective and provides a solid foundation in a systematic approach to organizing and managing organizational data. Such knowledge grows in importance when an entire organization operates in a highly distributed mode without the integrating forces of shared physical presence.

5 Conclusions

As you read the papers in the special section, we urge you to reflect on some critical questions. Times of great upheaval also provide opportunities for great learning, which raises the following question: what lessons should we, as IS educators, should keep in mind during the pandemic and when it finally passes? This question leads to a second question: how will we implement the lessons we have learned? Most

faculty have experienced situations in which there was great enthusiasm for some new practice or technology, but, due to a lack of follow-through, these great new ideas and the improvement they might have enabled fell by the wayside. We hope this special section provides a push to encourage faculty to more frequently share effective practices in a way that leads to lasting change.

Because of the pivotal role of information systems and information technology, we believe that the IS discipline should be able to lead in much of the transformation. At its core, the IS discipline studies system-level change. If an IS does not lead to change, what good is it? So, as experts in technology-enabled change, IS academics have a unique position to lead positive change in higher education.

Finally, we leave readers with a call for compassion: if ever we needed it, we do now. We urge you to find compassion for your students, your colleagues (including administrators), and yourselves. We face unprecedented challenges and uncertainty. At some level, we have all had to and will continue to have to feel our way through and do the best we can. As we navigate this new COVID-19 world, we should be satisfied with each other and ourselves for recognizing and tackling the challenges. In doing so, we will be able to enable the IS discipline to continue to thrive.

Acknowledgments

We thank CAIS Editor-in-Chief Fred Niederman for inviting us to put forth this special section and for providing his excellent guidance throughout the process. We also thank him for his openness to the unusual (dare we say innovative) process of putting together this special section. We also express our gratitude to the special section editorial review board members for their extraordinary diligence in providing useful, timely reviews.

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