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Sustaining and supporting the momentum of enduring pandemic practices

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Abstract

Faculty members impacted by the COVID-19 pandemic inadvertently participated in a historic, widespread, and rapidly occurring educational development phenomenon: the global shift toward emergency remote teaching. We surveyed faculty members (n = 502) at four different institutions (a community college and a small, medium-sized, and large university) and collected self-reported data on faculty members' continued use of educational technology tools or teaching techniques that they adopted for the first time during the pandemic. Faculty respondents also shared their perceptions on why this change to their teaching was valuable. Approximately 62% of the faculty surveyed reported their continued use of an educational technology tool, and 34% reported their continued use of a teaching technique or strategy. Higher education institutions must now consider the implications of these enduring pandemic practices, evaluate their effectiveness, and work to sustain the skill-building momentum of faculty who have invested time in adopting new technology tools and teaching techniques.

Keywords: educational technology, pandemic pedagogy, emergency remote teaching, educational development

Technology served as a lifeline during the COVID-19 pandemic. Those who teach primarily in-person, from K–12 through higher education,

were forced to move to a new teaching modality: emergency remote teaching (Hodges et al., 2020). Despite the enormous learning curve as faculty scrambled to find instructional tools and strategies that would facilitate learning at a distance, many faculty gained a new appreciation for the technologies and pedagogical techniques utilized during this time. Those who provide faculty support and study college teaching are beginning to observe which teaching practices, necessitated by the pandemic, have continued to endure as faculty make their return to campus (Holtzman et al., 2023; Manokore & Kuntz, 2022; Manturuk & Reavis, 2022; Moore et al., 2021). Colleges and universities are beginning to investigate ways of sustaining this momentum by responding with initiatives, such as Duke University's Carry the Innovation Forward, to "engage faculty in new professional development programs and communities that continue to build upon newly acquired skills and practices" (Duke University Learning Innovation, 2021, para. 8).

Faculty members impacted by the COVID-19 pandemic inadvertently participated in a historic, widespread, and rapidly occurring educational development phenomenon in the global shift toward emergency remote teaching. One way of measuring the impact of traditional educational development programming is by collecting data on whether faculty members made changes to their teaching after participating in an educational development opportunity such as a workshop or learning community (Hines, 2018). With this context in mind, we surveyed faculty members at four different institutional types: a community college and a small, medium-sized, and large university. Our central research question asks if faculty made an enduring change to their teaching by continuing to use a tool or technique used for the first time during the period of emergency remote teaching.

Our findings indicate that approximately 62% of the faculty surveyed across all four institutions (n = 502) reported their continued use of an educational technology tool that they adopted for the first time during the pandemic. Approximately 34% of the faculty surveyed across all four institutions reported the continued use of a teaching technique or strategy. We hope that this study will motivate higher

education institutions to investigate ways to sustain the skill-building momentum of faculty members who continue to utilize the tools and techniques they adopted during the period of emergency remote teaching. These faculty members undoubtedly made a significant time investment in their own educational development by learning how to use new technology tools, exploring teaching techniques, and trying new pedagogical approaches during their pivot to emergency remote teaching. To help faculty sustain the momentum of their efforts, we recommend that higher education institutions seek to better understand their faculty population's needs and the tools and techniques they found valuable and respond with appropriate support, programming, and resources.

In considering the implications of these enduring pandemic practices, we close with recommendations that emphasize the importance of partnering with faculty to carefully evaluate the effectiveness of the tools and techniques they adopted, as support for these adoptions were less than ideal during the COVID-19 pandemic. While the data suggest faculty are continuing to utilize the tools and techniques they found valuable, faculty may not have effectively implemented these tools and techniques due to the chaos of the COVID-19 pandemic. Therefore, our work with faculty should aim to further refine and improve upon these adoptions to ensure they are effective for student learning.

Literature Review

Globally, faculty members and centers for teaching and learning (CTLs) contributed literature on their teaching experiences during the COVID-19 pandemic. This is admirable given the need to devote time to the development of course content in a new format, additional administrative duties, and home-based needs such as childcare and self-care brought on by the pandemic. The following literature review focuses on faculty support, responding to faculty needs, and

early observations on the enduring practices faculty members found to be valuable after using them for the first time during the pandemic.

Faculty Support

At the start of the COVID-19 pandemic, colleges and universities rushed to create resources to address both technology needs and pedagogy. These resources were often informed by lessons learned from established practices in online teaching (Hodges et al., 2020). Many higher education institutions had not established continuity plans—used in emergency and disaster preparedness—specifically addressing the need for online instruction (Hodges et al., 2020; Moore et al., 2021). Indiana University launched a Keep Teaching website to house technology and remote teaching resources (Trustees of Indiana University, n.d.), and, through a Creative Commons license, hundreds of higher education institutions followed their lead (Stanford, n.d.). The spread of the Keep Teaching phenomenon continues to be documented in a Google Sheet created by Daniel Stanford (n.d.) at DePaul University's Center for Teaching and Learning.

Enterprise technology companies and educational technology providers soon began to offer their own resources, guides, and instructions on the tools and techniques of emergency remote teaching. As Krsmanovic (2020) observed, educators began to experience resource overload:

> The shortage of resources for remote teaching and work is certainly not an issue that faculty have experienced during the COVID-19 crisis. On the contrary, it is the magnitude, breadth, and variety of these resources that transpired as a barrier to their effective use. (pp. 56–57)

As faculty began to navigate these resources, they came to rely upon peers (Sumer et al., 2021) and social media communities (Muljana et al., 2022) for information and guidance. Faculty often prefer to hear about teaching experiences from other faculty (Morrison &

Shemberger, 2022), and preferences for faculty-vetted tools and teaching techniques had been observed prior to the pandemic (Kramer & Benson, 2013).

Responding to Faculty Needs

Educational development offerings, such as workshops hosted by faculty and educational developers through established CTLs, experienced high attendance early in the pandemic (Carter et al., 2021). Faculty soon began to feel overworked and overwhelmed, experiencing burnout and anxiety (Carter et al., 2021; Chen et al., 2022; Manokore & Kuntz, 2022; Pautz & Diede, 2022). Educational developers, too, experienced burnout (Chen et al., 2022). Tailoring CTL programming in response to burnout, by offering programming with elements of community (Moore et al., 2021) and self-care (Carter et al., 2021; Sumer et al., 2021), may provide faculty with a space to decompress and rejuvenate as they reflect upon and retool their teaching. Pautz and Diede (2022) recommended providing "space for faculty to talk and reflect" but cautioned that we intentionally "steer the conversation productively to avoid becoming mired in complaints with no forward motion" (p. 78).

In their survey of faculty members' motivation to re-engage in educational development programming, Pautz and Diede (2022) concluded that educational developers and CTLs are uniquely positioned to "help faculty and administrators to think through appropriate, sustainable practices they have developed during the pandemic" (p. 79). Inviting faculty back to our CTLs and providing resources to grow and refine the techniques they found most effective during the pandemic can help ensure that the momentum gained over the past 3 years is not lost. However, failing to respond to faculty fatigue and burnout may hamper institutional progress (Landy et al., 2022).

As we work to sustain the momentum of these enduring practices, it is important that we also work to refine and improve them, as faculty may have made significant modifications to the techniques they tried

for the first time during the rapid move to emergency remote teaching. In a pre-pandemic study on faculty adoption of pedagogical practices, Dancy and Henderson (2010) found that while faculty participants self-reported the adoption of a teaching strategy, follow-up questions indicated that many of those participants were using the teaching strategy in a way that was inconsistent with the key components that made the strategy effective for student learning. When faculty make significant modifications to established research-based teaching strategies, "there is a possibility that one or more components essential to student learning may be eliminated" (Dancy & Henderson, 2010, p. 1058). Given the less-than-ideal teaching conditions presented during the period of emergency remote teaching, Dancy and Henderson's observation may be helpful in informing our approach to working with faculty and guiding our conversations to detect the presence of ineffective or inconsistent approaches.

Early Observations on Enduring Practices

While many faculty relied on live, synchronous Zoom sessions that mimicked the traditional classroom lecture, other faculty moved away from live lecturing (Zakrajsek, 2021) and attempted new practices, often for the first time. These included adoption of flexible classroom management policies (Carter et al., 2021; Hills & Peacock, 2022; Holtzman et al., 2023); flipped classrooms (Manokore & Kuntz, 2022; Manturuk & Reavis, 2022); video production for student review (Holtzman et al., 2023; Manokore & Kuntz, 2022); rethinking how to assess student learning (Manokore & Kuntz, 2022; Maurer, 2022); and utilization of engaging technology tools (Carter et al., 2021; Sumer et al., 2021). Early reports on the tools and techniques faculty have continued to use after their return to campus are making their way into the scholarly conversation.

Faculty implemented flexible policies for student attendance and assignment deadlines (Hills & Peacock, 2022; Holtzman et al., 2023) by using flexible classroom management strategies to help mitigate

the stressors students were facing during the pandemic (Carter et al., 2021; Maurer, 2022). In a study of student reflections on their pandemic learning experiences, Kelly (2022) found student learning was impacted by lack of structure, engagement, and motivation; personal factors such as inability to find a space to work while quarantining with others, introduction of familial-related stressors, and financial-related issues; and technology-related issues, including internet connectivity or a lack of skills in educational and business computing (distinct from skills in using mobile devices and smartphones).

Early reports suggest that faculty are keeping the flexible classroom management practices they adopted during the pandemic (Holtzman et al., 2023). As described by Hills and Peacock (2022), flexible practices for participation, attendance, and deadlines can lead to a more equitable learning environment for students with special needs or those who encounter systemic barriers to their learning. In their interviews with faculty who implemented flexible attendance and due date policies, Holtzman et al. (2023) reported that their participants found these changes beneficial when the policies "balance structure and flexibility" (p. 6), whereas those faculty who implemented the most flexible policies without boundaries were dissatisfied with their classroom management choices.

In a study of faculty teaching English as a second language, participants reported their continued use of flipped classroom techniques after returning to face-to-face teaching (Moussaoui & Al-Hattali, 2022). However, flipping the classroom during the period of emergency remote teaching would have introduced a new set of challenges, such as facilitating active learning techniques in class using online video conferencing software. In a systematic literature review of flipped classroom experiences during the pandemic, Lo (2023) identified challenges such as students being unable to complete the preclass activities before the live, in-class session and students appearing disengaged during the live, in-class active learning activities, which resulted in poor in-class participation. The implications of the pandemic that impacted student learning—such as the barriers outlined

by Kelly (2022)—may have exacerbated issues with pre-class preparation. Student disengagement during in-class active learning activities could occur in either synchronous online or face-to-face settings, and Roehling (2018) recommended ways that faculty can monitor student engagement: rotating between groups and listening to conversations, soliciting the thoughts of a disengaged student, and providing immediate feedback on a group's progress.

Respondents in a survey distributed by Manokore and Kuntz (2022) identified short videos as useful for student review and scaffolding, and videos were further enhanced with apps that embed quiz questions within the video. Prior to the pandemic, the literature had established best practices for educational video content in online learning, such as the use of short videos chunked into segments of 5 to 7 minutes each (Smith, 2014). Faculty may wish to reuse videos produced during the pandemic, but they should first identify non-enduring content within their video collection—content that references due dates or logistical information from a previous academic term (Smith, 2014).

The pandemic shifted faculty toward utilization of non-traditional assessment techniques (Manokore & Kuntz, 2022), such as open book assessments or authentic assessments (Maurer, 2022). This led some faculty to revisit their learning objectives, think critically about their existing assessments, and decide what, exactly, they were assessing (Manturuk & Reavis, 2022). The use of authentic assessment was well documented prior to the pandemic, and scholars such as Wiggins and McTighe (2005) advocated for better alignment of objectives and assessment by using backward design.

With this background literature in mind, we proceed by first providing brief descriptions on each of the four institutions included in the survey. Institutional selection was driven by the research team who were introduced to one another through participation in a POD Connects group, hosted by the POD Network. Following the site descriptions, we describe the survey methodology used to better understand which educational technology tools and pedagogical techniques faculty adopted during the pandemic and have continued to use. We

then discuss survey findings, list limitations, and close by presenting recommendations and conclusions.

Site Descriptions

Community College

The community college represented in this study is an urban, public institution in a major U.S. city. The college educates roughly 4,000 students annually. The student population consists of students enrolled in career technological education fields and those preparing to transfer to a four-year institution to complete a bachelor's degree. At the time of this study, there were 128 full-time faculty and 378 adjunct instructors employed by the institution. While most students complete their degrees on campus, the community college offers nearly 100 fully online course electives. A remote teaching page was added to the CTL's website with resources and best practices to assist faculty in the pivot to emergency remote teaching. The CTL also serves as the primary resource for the college's learning management system (LMS), Brightspace. All courses offered at the college, regardless of delivery modality, are required to have a current syllabus posted to their Brightspace course shell and utilize the attendance tool. This requirement existed prior to the pandemic and continues to this day.

Small University

The small university represented in this study is a private liberal arts university in the southern United States with 85 full-time and 46 part-time or adjunct faculty members. They offer 70 undergraduate or graduate academic programs and serve approximately 1,800 students, both traditional and non-traditional. Financial assistance is awarded to 90% of their students who come from diverse backgrounds and educational experiences. Two master's degrees are offered fully online. The CTL,

along with the university's technology services department, provided resources to help faculty move to remote teaching. A web page of resources was developed by the CTL that included tips, relevant links, and tutorials created by experienced faculty members.

Medium-Sized University

The medium-sized university represented in this study is a selective enrollment public research university in the rural south with approximately 400 faculty members and approximately 8,600 undergraduate and 1,000 graduate students. The medium-sized university is known for its affordability and fast time-to-degree while maintaining instructional quality. The university does not have an active CTL or equivalent. Prior to the pandemic, almost all classes were held exclusively face-to-face, though many faculty members had experience teaching some asynchronous online classes (particularly during the summer quarter). A Keep Teaching website was created by the information technology department.

Large University

The large university represented in this study is a public, land grant research university in the southern United States with approximately 3,200 faculty members, 53,000 undergraduate students, and 13,000 graduate students. The university is primarily a residential campus, though online course electives are available at both the undergraduate and graduate level. Master's programs throughout the university can be completed entirely online. Faculty support during the pandemic was available through the university's CTL as well as a campus academic technology support unit. Of the campuses in this study, the large university had the most robust Keep Teaching website with both how-to technical resources and pedagogical resources on moving to emergency remote teaching. The transition to emergency remote teaching was further complicated by the university's planned transition to a new LMS, Canvas.

Methods

We conducted a survey asking faculty to identify educational technology tools and instructional strategies that they used for the first time during the period of emergency remote teaching and which tools and strategies they continued to use during the 2021–2022 academic year. The survey was administered at four different institutions: at a small university during the Fall 2021 semester, a medium-sized university during the Winter 2021 quarter, a large university during the Spring 2022 semester, and a community college during the Spring 2022 semester. The survey was approved by the Institutional Review Boards at all four institutions. Demographic information in Table 1 shows that the survey sample represents mostly faculty teaching primarily in a classroom setting—those who may have needed to make the most significant changes to their instructional practices during the shift to emergency remote teaching.

Participants were recruited via emails sent to faculty email lists. Our target respondents were individuals working at one of the four institutions who taught at least one course from the period between Spring 2020 and the survey field period. Faculty of all ranks and contract types were included, but graduate students who served as teaching assistants or course discussion section leaders and did not independently teach a course were not included. The respondents did not receive compensation for completing the survey. The recruitment text did mention that administrators at each institution would be sent a report describing aggregate survey results at that institution that,

Table 1. Faculty Respondent Representation

Campus	Male	Female	Non-binary	Teaching full-time	Primarily in a classroom
Community college (*n* = 61)	31%	61%	–	43%	84%
Small university (*n* = 44)	30%	59%	–	68%	66%
Medium-sized university (*n* = 58)	36%	53%	2%	79%	79%
Large university (*n* = 339)	48%	42%	–	77%	75%

Note: Some respondents declined to provide demographic data.

we hoped, could lead to benefits for all faculty at the institution. We obtained 502 valid responses, which represented a response rate of about 16% at the community college, 22% at the small university, 15% at the medium-sized university, and 10% at the large university. We felt that an online, anonymous survey with email recruitment was the most appropriate design for this study because email was the most common way that faculty at all four institutions received information.

The survey began by asking about educational technology tool use. Respondents listed educational technology tools that they used during the period of emergency remote teaching (Spring 2020 to Spring 2021), noted which tools they used for the first time during the period of emergency remote teaching, and reported which tools they had continued to use after Spring 2021 (Table 2). We investigated both technology tools and teaching techniques because online instruction often necessitates different pedagogical approaches alongside technology tools to support them.

We analyzed responses to this part of the survey by first categorizing educational technology tools by their primary function and then making frequency tables to examine educational technology tools that were used for the first time, that continued to be used, and that were

Table 2. Pandemic Practices Survey Questions

Focus	Questions
Technology tools	What educational technology tools did you use during the pandemic (between Spring 2020 and Spring 2021)? Please list as many educational technology tools as come to mind.
	Of the educational technology tools you listed above, which tools did you utilize for the first time during the pandemic?
	Of the educational technology tools listed above, please tell us which (if any) tools you have continued to utilize in your teaching.
	Why do you find this tool to be valuable?
Teaching techniques	Did you try a teaching technique, classroom management, or assessment strategy for the first time during the pandemic (between Spring 2020 and Spring 2021)?
	What was the new teaching technique, classroom management, or assessment strategy?
	Have you continued using this new technique/strategy?
	Why did you find this technique/strategy to be valuable?

no longer used. This approach involved each of the researchers reading through all survey responses to these questions and identifying common responses to each question. We then met and agreed on categories in which to code the responses. Table 3 shows that video conference and production software were the most common newly used tools.

The second part of the survey focused on teaching techniques and strategies. We asked respondents if they had used a new teaching technique, classroom management, or assessment strategy during the period of emergency remote teaching. Respondents were then asked why they found this strategy to be valuable and if they continued to use it after Spring 2021. We used the same generative coding approach to categorize responses to these questions. Table 4 shows that a wide range of techniques received continued use.

Table 3. Code Frequencies for Technology Tools

Code	Community college		Small university		Medium-sized university		Large university	
	First time	Cont. use	First time	Cont. use	First time	Cont. use	First time	Cont. use
Accessibility	0	0	0	0	1	1	4	1
Cloud productivity	9	7	2	0	2	2	18	9
Collab. suite	5	4	3	1	3	1	32	20
Content development	2	2	0	0	2	0	9	7
Content engagement tools	6	2	1	1	4	4	19	13
Assessment integrity	3	2	1	0	12	8	25	14
Instant messaging	1	1	0	0	3	2	5	1
LMS	1	1	5	5	2	1	85	79
Publisher content	2	2	2	1	1	0	6	4
Collaborative whiteboard	12	8	0	0	5	1	11	9
Video conferencing	30	25	25	16	43	31	184	141
Video production and/or hosting	16	12	18	7	15	10	28	19

Note: The large university had a previously scheduled transition to a new LMS that coincided with the period of emergency remote teaching. This illustrates how faculty chose to list tools that came to mind; most faculty at all institutions use a LMS, but faculty at the large university considered it a new technology tool worth mentioning.

Table 4. Code Frequencies for Techniques

Code	Community college		Small university		Medium-sized university		Large university	
	First time	Cont. use	First time	Cont. use	First time	Cont. use	First time	Cont. use
Flipped classroom	3	3	4	3	2	1	25	15
Formative assessment	0	0	9	6	1	1	13	10
Cont. discussions after class	1	1	0	0	0	0	14	11
Grading/classroom efficiency	2	2	4	3	3	3	18	15
Student well-being and/or equitable	8	6	5	3	4	4	12	10
Engagement-based	19	15	6	2	9	5	65	35
Integrity-based	3	2	1	0	6	2	20	10

This study does not aim to present a list of tools or techniques that are statistically significant. The researchers coded tool and technique frequency to better understand the types of enduring changes faculty made to their teaching. Manturuk and Reavis (2022) approached the analysis of their data, gathered in interviews with faculty who had permanently adopted a pandemic practice, in a similar way: "we were interested in finding the variety of experiences that instructors shared to gain as complete a picture as possible for the effective practices and pedagogies that had emerged from the remote teaching experience" (p. 158).

Findings

This study investigates the self-reported enduring changes faculty participants made to their teaching after inadvertently participating in an educational development phenomenon: the rapid, global shift toward emergency remote teaching. Our findings in Table 5 indicate that approximately 62% of the faculty surveyed (n = 502) reported their continued use of an educational technology tool they adopted for the

Table 5. Faculty Respondents' Self-Reported Continued Use of a Technology Tool or Teaching Technique First Used During Emergency Remote Teaching

Campus	Technology	Technique
Community college (*n* = 61)	44 (72.1%)	30 (49.2%)
Small university (*n* = 44)	20 (45.5%)	14 (31.8%)
Medium-sized university (*n* = 58)	39 (67.2%)	19 (32.8%)
Large university (*n* = 339)	208 (61.4%)	108 (31.9%)
Total (*n* = 502)	311 (61.95%)	171 (34.06%)

Note: Faculty may report one or more technologies or techniques.

first time during the pandemic. Approximately 34% of the faculty surveyed (*n* = 502) reported the enduring use of a technique. We further explore the findings on technology tools and teaching techniques in this section to better understand the tools and techniques that have endured and faculty perceptions on what made these changes to their teaching valuable.

Video Conferencing Tools

Perhaps unsurprisingly, the enduring use of video conferencing technologies was observed across all four of the higher education institutions surveyed (Table 6). Tools cited included Zoom, Webex, Microsoft Teams, and Lifesize. Examples of the continued use of video conferencing primarily referenced holding office hours online and allowing students who were quarantining to attend class virtually. Many of the qualitative comments suggested the continued use of video conferencing may have been a result of social distancing; for example, faculty may not want to meet with students in the confines of their office or to teach an infectious student in the classroom. One respondent shared, "Zoom allows kids who would have missed class to [attend virtually] and it allows people to get to office hours to ask short questions without having to come into campus." Additional uses for video conferencing technology identified by the respondents included inviting guest speakers into the classroom, the ability to hold class while faculty travel for conferences, and holding class during inclement weather.

Table 6. Enduring Use of Video Conferencing Technologies

Campus	First-time use	Continued use
Community college	30	25 (83.3%)
Small university	25	16 (64.0%)
Medium-sized university	43	31 (72.1%)
Large university	184	141 (76.6%)
Total	282	213 (75.5%)

Future studies should investigate the increasing or decreasing use of video conferencing technologies, how these may relate to campus life and social norms when interacting with ill students (e.g., those with COVID-19 or influenza), or how these norms evolve over time.

Video Production Tools

Following the continued use of video conferencing technologies was the enduring use of video production tools at each of the four higher education institutions surveyed (Table 7). These included tools such as Mediasite, Camtasia, WeVideo, YuJa, and VidGrid and associated hardware such as Wacom tablets and multiple camera switchers. Respondents overwhelmingly referenced the ease of using Zoom to provide video recordings. A respondent also gave praise to the automatic captioning features: "Zoom is great at screen-capture and pre-recording lectures if I will be out sick or traveling, plus it has built in closed captioning which greatly reduces the time to incorporate that for ADA requirements." Faculty also referenced the use of video production tools for creating libraries of video clips as described in this response: "Easy to take topics and capture them, create video playlists and remix video playlists as needed, [and] works well in in-person, hybrid, and remote teaching situations." As recommended by Smith (2014), faculty should be on alert for any outdated references within their existing videos, such as due dates or outdated announcements. Other survey comments referenced the use of both planned video

Table 7. Enduring Use of Video Production Technologies

Campus	First-time use	Continued use
Community college	16	12 (75.0%)
Small university	18	7 (38.9%)
Medium-sized university	15	10 (66.7%)
Large university	28	19 (67.9%)
Total	77	48 (62.3%)

collections and the creation of just-in-time videos to address students' needs, as one participant described: "Videos are a much better way to explain some content than a worksheet or long email." Whether faculty follow through on their self-reported plans to reuse their video collections remains to be seen, and future studies should explore the extent to which faculty have reused the video collections they created throughout the pandemic.

Uses for video production also included the recording of long-form classroom capture content for student review and excused absences (such as student athletes traveling to games). One respondent found the recording capabilities of Zoom was a better match for their needs compared to the classroom capture hardware installed in their classroom:

> Before the pandemic, I used technology in some of the classrooms to record class. . . . Once I started using Zoom for remote classes, [I] realized I had far better control over creating and managing the videos. I continue to use Zoom during class to record lectures for students to rewatch, even though students are no longer using Zoom for remote attendance.

Collaborative and Productivity Tools

Other examples of enduring technology tools included the continued use of collaborative suites, whiteboarding, and cloud productivity

Table 8. Collaborative and Productivity Tools Identified on the Community College and Large University Campuses

Tools	Community college		Large university	
	First-time use	Continued use	First-time use	Continued use
Collaborative suite	5	4 (80.0%)	32	20 (62.5%)
Collaborative whiteboard	12	8 (66.7%)	11	9 (81.8%)
Cloud productivity	9	7 (77.8%)	18	9 (50.0%)
Tools total	26	19 (73.1%)	61	38 (62.3%)

Note: Faculty may report the use of one or more tools.

tools, though these appear to be most prevalent on the campuses of the community college and large university (Table 8). Cloud productivity examples included students collaborating on documents in Microsoft 365 and Google Drive. One participant found these tools "allow students with minimal experience to work in a practical way, to enhance their ability to practice collaborative dependencies, and [to learn] to work within a team." Collaborative suites included the use of Slack and Microsoft Teams. It is worth noting that, while Microsoft Teams also has video conferencing capabilities, responses were coded based upon qualitative data that provided context on the use of Microsoft Teams in a manner comparable to other collaborative suites, such as Slack. Collaborative whiteboard tools included Padlet, Miro, and Jamboard, and although whiteboard capabilities within video conferencing systems are available to presenters, these qualitative responses were coded based on the context of collaboration among multiple students. For example, this participant described their students' use of a collaborative whiteboarding tool: "I like Google Jamboard for collaborative learning exercises where all the students can log in, add content, build a visual and then use [the content] as a study tool." These collaborative whiteboard tools were also useful for allowing students in the classroom to collaborate with students joining the class remotely due to quarantine, as one participant shared: "Miro allows for greater interactivity for students

in-class, and allows for students who have to attend remotely to do so (and still participate)."

Engagement-Based Techniques

Faculty reported their continued use of student engagement techniques they found valuable, such as the inclusion of student-centered activities throughout a lecture (Table 9). Some of the techniques reported by faculty were quite simple, such as worksheets with a list of questions for students to answer during the lecture. One participant shared the benefit of providing a question list of this kind: "Students need to pay attention to the lecture to get the answer and it encourages [them] to ask questions." Engagement-based changes reported by faculty sometimes dovetailed into rethinking student assessment, as this participant described:

> I have been moving away from formal assessments (tests and quizzes) for a while, but the pandemic convinced me that those tools are worthless. Once you convince students that you are more interested in the experience of learning and not assessing what they remember later on, they really start to engage with the material with enthusiasm.

Manturuk and Reavis (2022) also observed faculty adoption of more authentic assessments due to the impracticality of exams during the pandemic.

Table 9. Enduring Use of an Engagement-Based Technique

Campus	First-time use	Continued use
Community college	19	15 (78.9%)
Small university	6	2 (33.3%)
Medium-sized university	9	5 (55.6%)
Large university	65	35 (53.8%)
Total	99	57 (57.6%)

Table 10. Enduring Use of Flipped Classroom Technique

Campus	First-time use	Continued use
Community college	3	3 (100%)
Small university	4	3 (75%)
Medium-sized university	2	1 (50%)
Large university	25	15 (60%)
Total	34	22 (64.7%)

Flipped Classroom Techniques

Some respondents specifically referred to the flipped classroom model in their responses (Table 10), while others provided a description of what could be considered flipped classroom techniques (students were assigned a video lecture to watch before class; time together during the live, synchronous online class session was used for active learning). It is unclear whether those respondents self-reporting the use of flipped classroom techniques were following the flipped classroom model as described by Roehling (2018) or if concessions and modifications to the model were made. Examples of flipped classroom techniques also demonstrated the use of formative assessment techniques by embedding quiz questions within the assigned pre-class video, as described by this participant:

> We used Edpuzzle for inserting questions into video instruction and 'chunking' long videos into shorter segments. Long instructional videos needed to be broken down with formative assessment built in periodically to ensure learning was taking place at an acceptable level.

One participant responded that they had wanted to try flipped classroom techniques in the past, and the period of emergency remote teaching provided the motivation to try it for the first time: "The pandemic gave me the motivation to record my lectures so that [I] could follow a flipped classroom approach and use class time for discussion and group activities. I had long wanted to pursue this approach."

Table 11. Enduring Use of a Student Well-Being or Equitable Technique

Campus	First-time use	Continued use
Community college	8	6 (75%)
Small university	5	3 (60%)
Medium-sized university	4	4 (100%)
Large university	12	10 (83.3%)
Total	29	23 (79.3%)

Student Well-Being and/or Equitable Techniques

Faculty reported a variety of techniques they have continued using for student well-being and creating a more equitable learning environment, such as modifying due dates, attendance, and participation points (Table 11). Changes of this kind benefit all students but especially those students most likely to encounter systemic barriers to their learning (Hills & Peacock, 2022). Some faculty reported substantial changes that have the potential to address systemic barriers, such as the use of grading contracts and more transparency in assessment. One participant shared:

> I began using grade contracts. It makes the criteria for earning a particular grade clearer. The grade is based on process/labor rather than outcome. I teach writing, so students who are native English speakers have an advantage in the class. This levels the playing field for students. While I didn't adopt it to make my class more equitable, I am continuing to do it [because] I see it as an antiracist teaching practice.

Another participant discovered learning analytics tools in their LMS, which they used to identify potentially problematic quiz questions: "I appreciated the ability to quickly analyze the statistics of questions. The tools show how the students are engaging further than the final grade. These tools have helped me understand how the wording of some questions can be inequitable."

Limitations

The central research question for this study asks if faculty have continued to use a tool or technique in their teaching that they tried for the first time during the period of emergency remote teaching. This study is not without limitations. The study was not designed to gather long-form qualitative data on faculty experiences with the tools and techniques they self-identified, and further exploratory study is needed in this area. The study was not designed to determine the effectiveness of these enduring changes, nor was it designed to determine if the faculty self-reported an accurate description of the tools and practices they had adopted. The qualitative data collection asked participants to provide brief descriptions rather than lengthy explanations of their practice, and these brief descriptions were used to provide context to help the researchers better understand the use of a tool or technique for more accurate coding.

The survey did not attempt to explore aspects of campus life such as social distancing, quarantining, mask mandates, or vaccine acceptance, which were very much a part of the teaching experience during the survey field period. These social factors and evolving social norms likely impacted the continued use of tools or techniques during the survey field period and may be considered a limitation of this study. Future studies are needed to investigate the longevity of enduring pandemic practices and how those practices may continue to evolve alongside the evolving post-pandemic social norms. The survey did not specifically seek to gather data on the co-occurring social justice and misinformation crises in the United States, where this study was situated, but rather on the effect of the global COVID-19 pandemic and the period of emergency remote teaching.

Recommendations

Our first recommendation is for higher education institutions to survey their own faculty to identify which specific tools and techniques

utilized for the first time during the pandemic have continued to endure on their campus. Pautz and Diede (2022) recommended the distribution of a survey and/or needs assessment as one action educational developers can take to keep faculty moving forward. They also cautioned that, "while it is often advantageous, perhaps tempting, to see what others are doing, now more than ever, faculty developers have to meet the needs of individual campuses" (p. 79).

Next, we recommend inviting faculty back to our CTLs through workshops and programming tailored to address enduring tools and techniques identified on our campuses while also investigating the ways in which CTLs and academic technology support units can continue to support faculty in their use of these tools and further refinement of adopted practices. For example, workshops on active learning could be offered in response to faculty members' newly acquired video production skills and enduring use of flipped classroom techniques. This might include inviting individual faculty members to share their effective pandemic practices (Maurer, 2022; Morrison & Shemberger, 2022) or through a community of practice (Chen et al., 2022; Manokore & Kuntz, 2022). Chen et al. (2022) outlined how programming such as communities of practice can "provide the emotional, professional, and social support" (p. 120) needed by both faculty members and educational developers and "rejuvenat[e] our mental and emotional energies" (p. 146). Beyond better connecting CTLs and faculty, the pandemic highlighted the need for CTLs, educational developers, faculty pedagogical support, and communities of practice—support structures that have not been universally implemented across institutions. For those institutions without such support, we recommend implementing these support structures in concert with addressing faculty needs highlighted in campus surveys.

We recommend being mindful of the less-than-ideal conditions our faculty were working within while teaching with these tools and techniques for the first time. It is also important to reiterate how quickly the shift to emergency remote teaching occurred, and faculty were likely rushed as they newly implemented tools and techniques. CTLs would

be wise to view future programming as an opportunity for further refinement and improvement of pedagogical practices adopted during the pandemic. Even under the most ideal conditions, faculty often make modifications to established teaching practices that may neglect key components necessary for student success (Dancy & Henderson, 2010). Educational developers should be aware that undesirable and ineffective modifications may have occurred during adoption, and these ineffective aspects of a teaching practice may continue to endure. Educational developers working with faculty in one-on-one consultations or group settings should bring this point to the conversation, work with faculty to identify ineffective modifications, and develop a plan for remediation.

Our final recommendation is to think critically about the types of momentum we wish to sustain on our campuses when reviewing survey results. We may observe faculty reporting teaching practices that are largely punitive or exhibit policing behavior. Emergency remote teaching, and the recent public release of generative AI tools, introduced opportunities for academic dishonesty. Workshops, programming opportunities, and information sharing may be helpful in responding to recently adopted practices that are not in line with the teaching and learning culture of a campus. Educational developers, therefore, can invite their faculty to revisit assessment practices that could alleviate the need for policing behavior.

Conclusion

Faculty respondents self-reported the enduring changes they made to their teaching as a result of the shift to emergency remote teaching during the COVID-19 pandemic. CTLs and educational developers must now consider the implications of these enduring pandemic practices, evaluate their effectiveness, and work to sustain the skill-building momentum of faculty who have invested time in adopting new technology tools and teaching techniques. While an online, opt-in anonymous survey cannot tell the complete story of faculty needs, survey

results can provide insight on trends and topics of interest that can be used to inform educational development programming. Reports on teaching practices necessitated by the pandemic and those which have continued to endure are beginning to appear in the literature. We expand upon these early works by reporting on the enduring use of technology tools and instructional strategies across the institutions we surveyed, which included insights on why faculty found these changes to their teaching valuable. These tools and strategies will hopefully provide a foundation upon which educational developers can build as they roll out programming on their own campuses.

Biographies

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Conflict of Interest Statement

The authors have no conflicts of interest.

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