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Emergency Remote Teaching Versus Planned Remote Teaching: Narrowing the Gap With Targeted Professional Development

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Abstract

Objectives: This study reviews faculty members' comfort level with remote teaching in the Fall 2020 semester to evaluate the effectiveness of the professional development workshops.

Method: Using survey research, we examined professional development activities and subsequent comfort level and ease of adjustment with remote teaching in Fall 2020.

Results: Following the training, faculty reported high planned usage of various online teaching tools and great comfort with using them. The data reveals some differences between part-time and full-time faculty members.

Conclusions: The experience gained in the emergency semester, combined with the targeted professional development workshops offered eased the stress of planned remote teaching in the following semester.

Implication for Theory and/or Practice: For institutions planning to incorporate educational technology in the future, the implementation and evaluation of the targeted workshops may serve as a replicable model. It may also help institutions be better prepared for emergency remote teaching in the future.

Recommended Citation

Introduction

In Spring 2020, the global pandemic caused by the coronavirus COVID-19 disrupted industries around the world, including higher education. In March 2020, nearly all institutions in the United States quickly moved courses to remote learning. This study took place at a small, private, liberal arts institution in the Midwestern United States. The institution has been a leader in online learning and has been offering classes in this modality for over two decades. Prior to the pandemic, 50% of the courses scheduled for the Spring 2020 semester were planned as online courses (38%) or blended/hybrid courses with some type of online component (12%). Even so, most of the undergraduate curriculum was taught in the traditional face-to-face format. These courses were abruptly launched online for the second half of the semester. Because of the unprecedented speed of the transition, Hodges et al. (2020) proposed the term emergency remote teaching to distinguish this time period from a more traditional planned online or remote teaching.

As the pandemic continued, the institution offered faculty a choice of teaching modalities in Fall 2020. Faculty could choose between modified on-campus courses, the newly popular synchronous online mode, the traditional asynchronous online, and blended/hybrid modalities. At that point in the pandemic, it was assumed that the modified on-campus courses would include some remote or perhaps self-study components whether due to quarantine, social distancing, or other pandemic measures in place at the time. Accordingly, we refer to Fall 2020 as a period of planned remote teaching, in contrast to the abrupt or emergency switch in Spring 2020 when the pandemic first hit.

To assist with the planning and implementation, a faculty committee conducted in-house, peer-facilitated training sessions during Summer 2020. The present study provides an account of the types of sessions conducted, the likelihood and comfort level of implementing learnings and tools, and the frequency of use of various LMS tools. While some faculty may have had experience teaching online in the past, the survey sought information from all faculty members, regardless of experience level. This case study information could be useful for institutions relatively new to online learning that may be planning for professional development post-pandemic.

Literature Review

Distance education is not a new phenomenon, but it has become more mainstream in institutions of higher education (Simonson et al., 2019). With the impact of the global pandemic in 2020, it can be assumed that most institutions have now had some exposure to online or blended/hybrid learning either in an emergency capacity or as a part of regular operations. For those institutions with prior experience in online learning, there is a keen recognition that preparing to teach online takes careful planning (e.g., Conrad & Donaldson, 2012; Ko & Rossen, 2017; Major, 2015; Sharoff, 2019; Simonson et al., 2019). The literature continues to expand post-pandemic due to the new and growing interest in the subject (e.g., Aguilera-Hermida, 2020; Bryson & Andres, 2020; Colclasure et al., 2021; Hebert et al., 2022; Roy & Covelli, 2021).

Planned Remote Teaching

Planned remote teaching includes basics such as defining the learners, identifying content, deciding upon what type of media to use, choosing educational materials, and learning the course management system (Simonson et al., 2019). It should involve using a structured process to develop a course (Sharoff, 2019; Kilis & Yildirim, 2019). Simonson and colleagues suggested that instructors planning to teach online should begin 3–5 months before the start of the course to prepare materials, outline the calendar, establish rubrics, and identify communication pathways. Some institutions had previously developed courses and certificate programs that faculty members were required to take prior to teaching an online course (Hamilton, 2016).

While some of these preparation programs were designed in a deliberate manner, many fell short of the wide variety of skills needed to effectively teach online (Lane, 2013).

Kumar et al. (2019) reviewed award-winning remote teaching practices and found five key elements. The first two elements included creating relevant course materials with the use of multimedia resources. Moreillon (2015) and Sherman et al. (2018) agreed and encouraged remote teachers to use digital tools to increase interaction. Turkay (2016) found that animations using a whiteboard resulted in higher enjoyment, attention, and engagement among students compared to using narrated slides, podcasts, or blogs. Sartor (2020) described "digital age pedagogy" and provided suggestions for free interactive tools available to instructors from internet-based resources (p. 2). Tools recommended included video content creation, whiteboard-type interaction, and the use of assessment tools whereby instructors can set up quizzing or flash card type exercises for students. While Sartor (2020) provided an overview of several tools, as Yoshida (2018) pointed out, technology changes rapidly, and the use of external teaching tools changes over time. Both authors agreed that the use of digital tools is an important element of effective teaching.

The third and fourth suggestions included best practices related to student-driven content creation, group work, and reflection. Berge's (2002) model supported this idea by suggesting a learner-centered eLearning classroom that promotes interaction with content, peers, and instructor as well as feedback and evaluation. The various tools suggested by Sartor (2020) are almost all student-driven content-related tools, and many of these tools can be used for group interactions and reflective activities.

The final suggestion for best practice was that the instructor should be active in their "explanation of the purpose of activities, technologies, and assessments in the online course" (Kumar et al., 2019, p. 160). Sartor (2020) also indicated that faculty interaction with students was an important measurement of student success. Knowing how to be present through faculty interaction in an online classroom requires thoughtful preparation and training (Martin et al., 2019). Wilson and Stacey (2004) came to a similar conclusion that faculty development is vitally important to displaying teaching presence online.

Emergency Remote Teaching

The emergency switch to remote learning in early 2020 required some faculty to begin teaching online or remotely with no prior experience or training (Hebert et al., 2022). In a study of four public universities in the southern United States, data indicated that 35% of faculty had no previous online experience, and they estimated, based on a combination of studies, that "one-third to one-half of U.S. faculty entered the pandemic-induced online transition with no previous online teaching experience" (p. 68). Some of these instructors sought peer mentoring and training programs to assist them during the emergency period. However, it is unclear if this training was sufficient to achieve the same level of quality evident in planned remote teaching.

Several studies were conducted during the emergency remote period that sought to measure the effects of what was occurring in real time (Aguilera-Hermida, 2020; Bryson & Andres, 2020; Colclasure et al., 2021; Hebert et al., 2022; Roy & Covelli, 2021). Aguilera-Hermida (2020) examined student attitudes and acceptance of online learning during the emergency period. Their study showed that students were negative about the experience and that the online learning experience lacked support from university resources and professors. In planned remote teaching, there would be mitigation to at least prepare students to have access to resources and interaction with the professor (Kumar et al., 2019). Colclasure et al. (2021) conducted an interview-based study and found that students experienced challenges related to their learning, their ability to access technology, and personal challenges such as mental health and personal responsibilities. In addition, faculty involved in the study observed many challenges for students who lost a face-to-face learning community, including loss of faculty interaction that may have contributed to an impact on students' motivation and engagement.

Hebert et al. (2022) studied the online experience prior to and during the emergency semester. Their results indicated that more seasoned online instructors had more positive teaching experiences during the emergency semester. Less experienced instructors had less positive teaching experiences; however, they demonstrated greater improvements. Their results showed that faculty who took advantage of mentoring or training programs during this timeframe were more likely to have positive experiences. Colclasure et al. (2021) found that faculty with no online teaching experience were negatively impacted by the lack of planned professional development in online teaching tools.

Bryson and Andres (2020) examined three courses that were converted from face-to-face instruction to online in Spring 2020. Both instructors involved in the study had extensive experience teaching and in using various online teaching platforms, yet they still reflected that synchronous online teaching required an extensive amount of time and effort during this time. As a best practice, they noted that a planned remote course should include extensive (online learning support such as road maps) and intensive (plans for engagement) experiences. As a result of the pandemic, the future of instruction (both face-to-face and online) may require a mixture of teaching techniques. Reflecting on best practices may assist instructors as they plan for this future.

Johnson et al. (2020) surveyed 897 faculty and administrators from 672 institutions in 47 states across the United States to understand how institutions had continued education during the early stages of the pandemic, the techniques they were using, any course modifications they had made from face-to-face to online, and what would have helped them most during this unprecedented time. Their findings noted the need for training. Specifically, they found that:

- Almost 90% of the institutions represented in the study had switched to emergency remote teaching.

- More than half (56%) of faculty reported using new teaching methods. This included two-thirds of faculty with no prior teaching experience and half of faculty with prior experience teaching online.

- Distribution of materials using the institution's learning management system (83%), synchronous video (80%), and asynchronous recorded video lectures (65%) were the techniques predominantly used to continue education during the pandemic.

Information on how to best support remote students (64%) and greater access to online digital materials (61%) were the top two areas in which faculty indicated they needed assistance. Approximately 38% indicated that assistance with technology to support online education might be beneficial.

Roy and Covelli (2021) found that in the emergency remote teaching (without preparation) phase, interactive tools were infrequently used in synchronous online sessions. The use of these tools seemed to be more the exception than the rule during the emergency remote teaching phase.

Planned Remote Teaching Preparedness for Fall 2020

The literature on planned remote teaching post-pandemic is still developing. Top Hat (2020) released an early report in August 2020 on faculty preparedness for Fall 2020. Based on interviews of 808 individuals (82% faculty and 18% other higher education staff) mostly in the United States, the findings reinforce the need for training faculty for remote teaching. Specifically, the study results showed:

- Less than 20% of faculty respondents were receiving institutional support to use educational technology for their classes.

- 58% were concerned about their ability to create engaging learning experiences.

- 81% were concerned about their ability to keep students engaged outside class.

- Half of the respondents reported receiving minimal support in learning how to use tools to engage students in synchronous and asynchronous remote environments.

Purpose of the Study and Research Questions

A faculty survey was administered in the authors' institution in Spring 2020 to evaluate the emergency remote teaching experience (Roy & Covelli, 2021). After the emergency semester ended, professional development was implemented during the Summer 2020, and a faculty readiness plan was created for Fall 2020. The current study documents this intervention and seeks to assess its effectiveness. Professional development included a series of peer-facilitated workshops to help faculty prepare for Fall 2020. Following the professional development initiative during the summer, a survey was administered to faculty members to assess comfort level, ease of adjustment, and comfort using various online tools.

Several research questions were addressed.

- How helpful were the professional development sessions for faculty? How likely were they to implement what they had learned? What factors influence the likelihood of implementation?

- Which were the most attended sessions? What insight does it provide into COVID-induced training needs? How helpful were these sessions?

- In the Fall semester, how comfortable were faculty with applying the tools demonstrated during the training sessions? Are there any differences in comfort level between full-time and adjunct faculty?

- How often were various LMS tools used in the four different teaching modalities in Fall?

Methods

Setting/Context
The study was conducted at a small, liberal arts institution in the Midwestern United States. Institutional Review Board (ethics) approval was received prior to distribution of the survey (#2020-21-0026). The institution has offered online courses for two decades while also maintaining a large array of on-campus traditional face-to-face and blended/hybrid courses. Prior to the pandemic, 50% of the courses scheduled for the Spring 2020 semester were planned as online courses (38%) or blended/hybrid courses with some type of online component (12%). The other 50% of the courses scheduled were traditional face-to-face lecture style courses (31%) along with other traditional face-to-face experiences such as clinical, internships, labs, or in-person experiences (19%). As the pandemic began, all Spring 2020 courses were transitioned to emergency remote.

We refer to Fall 2020 as a period of planned remote teaching. The institution offered faculty the option to teach in their preferred modality in Fall 2020. Classes were scheduled in four different modalities in Fall 2020: modified on-campus lecture or lecture/lab (face-to-face) (24%); blended/hybrid (15%); livestream video (synchronous online) (5%); and traditional (asynchronous) online (43%). There continued to be other modified face-to-face experiences (13%) such as clinical and internships that were in-person, blended, or online on a case-to-case basis. Note that the on-campus lecture or lecture/lab (face-to-face) sessions were modified based on government-mandated social distancing rules, and many classes included a remote or self-study component for students who could not be present due to quarantine or other reasons.

A series of peer-facilitated professional development workshops was launched in Summer 2020. The faculty development group that planned and organized the workshops included faculty representatives along with an

administrative support representative familiar with academic technology. The faculty development group first administered an informal survey to gauge faculty interest and need. Based on the responses gathered from this needs-assessment survey, a two-pronged strategy was developed for faculty training and preparedness. First, an online teaching resources course was created in the learning management system (Canvas) as a repository of content that faculty could access on an as-needed basis. All full-time and part-time faculty as well as administrators teaching at least one course (N = 340) were enrolled. By the start of the fall semester, 193 (57%) had logged into the course at least once. Second, a four-week series of synchronous online workshops was developed. Topics covered included use of features and tools within Canvas, digital tools for screen recording and quizzing, and best practices in online pedagogy such as classroom management in remote environments, creating engaging lessons, reimagining social interaction and connection, and teaching onsite with remote participants. These were organized thematically from basic to advanced and included such topics as uploading a course syllabus to the LMS, testing security, and setting up the online grade book.

Table 1 presents a list of faculty development workshops. Some topics covered multiple sessions and various options available to faculty. For example, the topic involving creating quizzes was broken down into uploading test banks to the Canvas LMS and creating quizzes using the different types of questions that Canvas permits (such as multiple choice, multiple response, matching, and essay). External quizzing apps were also demonstrated.

Table 1. *Faculty Development Workshops*

Week/Theme		Select topics
Week Setting up your Canvas course	1	Creating modules Uploading syllabus Creating engaging remote lessons Screen recording
Week Adding activities and assignments	2	Creating assignments Creating quizzes Setting up the online grade book Canvas collaborations
Week Teaching your course; interactions	3	Attendance Zoom Testing security Canvas Inbox
Week Advanced topics	4	Reimagining social interaction Digital tools to enhance learning Teaching onsite with remote participants Classroom management in remote environments

The choice of advanced topics in the faculty development workshops was guided by the needs imposed by the pandemic. Physical interaction in class was limited by the social distancing guidelines in place at the time; also, a face-to-face class could have students attending via an online platform or self-study if they were quarantined or taking care of a sick family member. This provided the impetus to reimagine social interaction, for instance, and learn how to keep remote participants engaged in a class that had most students attending in person.

Sessions were offered via Zoom by faculty who were experienced in using the tools and volunteered to share their expertise. Some sessions were offered multiple times and thus led by different facilitators. Recordings of all sessions were posted to the online course in Canvas to also serve as on-demand tutorials if required.

A total of 55 sessions were offered of which 457 total attendances were recorded. Attendance at individual sessions varied from a minimum of two to a maximum of 23.

Population and Sample

A total of 457 attendances were recorded. The number of attendances differs from the headcount of faculty members in the summer roster since some attended multiple sessions while others did not attend any. Feedback on these sessions was collected via an online feedback form that was sent to all who attended. Those attending multiple sessions could fill out the form multiple times, indicating on each response form which session they were evaluating. A total of 156 responses were received from 47 faculty comprising 13.8% of the summer roster. The survey for the fall online teaching experience was administered online to 384 full-time and part-time faculty on the fall roster. Eighty-two (82) responses were received, representing 21.3% of the population.

Procedures and Instrumentation

To gather feedback on the professional development sessions, we provided a six-question feedback form for attendees to complete online. Five questions (see Table 2) used a 5-point Likert-type scale from 1 (*not at all likely/not confident*) to 5 (*very likely/very confident*). The first two research questions draw on the responses to these five questions. The sixth was an open-ended question asking respondents what they would like to learn in future training sessions, an issue not covered in the present study.

In addition, near the end of the fall semester, a 12-question survey was administered to all full- and part-time faculty to assess comfort level, ease of adjustment, and overall satisfaction with a semester of planned remote teaching. The survey instrument included "multiple select" questions as well as quantitative questions using a 5-point Likert-type scale from 1 (very uncomfortable) to 5 (very comfortable). The questions that relate to the third and fourth research questions are provided below.

- On a five-point scale from 1 to 5, how comfortable are you using the following features/tools in a Zoom session hosted by you? (A list of features/tools was provided).

- On a five-point scale from 1 to 5, how comfortable are you using the following features/tools in Canvas? (a list of tools was provided).

- Select all modalities of courses in which you are using the following Canvas features/tools (the four modalities were provided, along with checkboxes).

Questions were asked separately for features within Zoom, the video conferencing platform that was expected to be used primarily for synchronous online classes, and Canvas LMS could be used for all class modalities and especially for asynchronous online classes.

On the list of tools/features in a Zoom session, "annotate" was provided as a separate option from "whiteboard" anticipating that faculty would interpret them differently. A "whiteboard" is typically interpreted as a blank screen that *faculty* would use simultaneously with a writing instrument to explain course content. "Annotate," on the other hand, would mean any background in screen-sharing mode on which *students* could be invited to illustrate something using a pen or a sticker.

The survey was administered online to all full and part-time faculty teaching in Fall 2020. The last two research questions were answered through analysis of data from this survey.

Data Analysis

Spearman's rank correlation analysis was conducted, pairwise, on the numerical responses to the five Likert-type questions on the training feedback form. ANOVA tests were conducted on the Likert-type questions on the end-of-semester survey to assess whether full-time and part-time faculty members' responses differed significantly. These analyses were performed using SPSS.

Results

Research Question #1

How helpful were the professional development sessions for faculty? How likely were they to implement what they had learned? What factors influence the likelihood of implementation?

Mean ratings for the five Likert-type questions on the feedback form are presented in Table 2. The training sessions received very positive feedback in general. All five parameters used to evaluate the sessions received an average rating greater than 4 on a 5-point scale.

Table 2. *Means Associated With the Five Faculty Feedback Questions*

N = 156

	Mean
1. How likely are you to implement the things you learned in this training session?	4.44
2. How confident are you in your ability to use the tool(s) presented?	4.13
3. How likely is the content of the training session to support your teaching goals?	4.35
4. How likely are you to recommend this training session to a colleague?	4.56
5. How likely are you to participate in follow-up/advanced training on the topic?	4.24

Spearman's rank correlation analysis for question pairs (1,2) and (1,3) indicates that the likelihood of implementing a tool is significantly correlated with both confidence in the ability to use the tool (ρ = .47; $p <$ .001) and the extent to which teaching goals are supported by it (ρ = .74; p < .001). Analyses of pairs (1,4) and (1,5) indicate that the greater the likelihood of implementation, the more likely a faculty member would recommend the training session to a colleague (ρ = .48; p < .001) and would be interested in a follow-up session (ρ = .46; $p <$ .001). Similar analysis of pair (2, 5) reveals that interest in a follow-up session is correlated with confidence in the ability to use a tool (ρ = .16; p = .04).

Research Question #2

Which were the most attended sessions? What insight does this provide into COVID-induced training needs? How helpful were these sessions?

Table 3 presents the six most attended/evaluated sessions along with mean and standard deviation of ratings provided by faculty who completed the evaluation form. Keywords from the five questions listed in Table 2 are used as column labels.

While topics such as screen recording would have been useful even prior to the pandemic, to create material for online or blended courses, faculty interest was primarily in teaching tools that became a necessity for remote teaching during the pandemic. Creating Engaging Remote Lessons and Zoom were the two most attended sessions. The former would be helpful for all faculty, but especially for those choosing online and blended/hybrid formats for fall. The ability to use Zoom would be critical for those opting for the synchronous online modality. The pandemic likely drove interest in online proctoring software as well, as faculty switched from pen-and-paper-based exams to online exams. Interest in digital tools and collaborations, similarly, would have been fueled by the recognition that student engagement had become a challenge during remote teaching.

Table 3. *Faculty Feedback Statistics for the Most Evaluated Sessions*

Topic	Implement	Confidence	Goal support	Recommend	Follow up
Creating Engaging Remote Lessons		*Attended: 44; Evaluated: 19*			
Mean	4.74	4.05	4.58	4.74	4.58
Standard deviation	.56	.91	.69	.65	.86
Zoom		*Attended: 44; Evaluated: 14*			
Mean	4.79	4.07	4.36	4.07	4.71
Standard deviation	.58	.92	.75	.73	.61
Online Proctoring		*Attended: 34; Evaluated: 10*			
Mean	4.20	3.50	4.00	4.40	3.80
Standard deviation	1.03	1.27	1.25	.70	1.40
Digital Tools		*Attended: 29; Evaluated: 11*			
Mean	4.27	3.36	4.09	4.18	4.64
Standard deviation	.79	1.36	.94	.87	.51
Canvas Collaborations		*Attended: 25; Evaluated: 16*			
Mean	4.19	4.06	4.25	4.50	4.13
Standard deviation	.98	1.12	.93	.82	1.09
Screen Recording		*Attendance not recorded; Evaluated: 15*			
Mean	4.20	4.07	4.13	4.47	3.80
Median	.78	1.03	.84	.64	1.21

With a few exceptions, all sessions received an average rating greater than 4.0 on all five training evaluation questions. Faculty were moderately confident (average rating between 3.0 and 4.0) in their ability to use online proctoring software and moderately interested in a follow-up session on the topic. The other exceptions were confidence in the ability to use the digital tools demonstrated and interest in a follow-up session on screen recording. Thus, we conclude that faculty found the training sessions helpful as they prepared for fall.

Research Question #3

In the Fall semester, how comfortable were faculty with applying the tools demonstrated during the training sessions? Are there any differences in comfort level between full-time and adjunct faculty?

Table 4 presents mean comfort levels of the two groups of faculty members with various synchronous interaction tools. The tools are listed in descending order of full-time faculty comfort level.

Table 4. *Comfort With Synchronous Interaction Tools*

Tool	Full-time	Part-time/adjunct	*F* (significance)
Chat	4.35	4.25	.13 (.724)
Breakout rooms	3.72	3.29	1.78 (.186)
Polling	3.58	3.36	.49 (.488)
Whiteboard	2.95	2.89	.00 (.986)
Annotate	2.74	2.75	.03 (.854)
n	43	28	

A distinct difference is noted between the high comfort level (>4) for chat, moderate comfort level (3–4) for breakout rooms and polling, and low comfort level (<3) for annotate and whiteboard for both groups of faculty. Results of ANOVA tests, reported in the last column, reveal that the differences in comfort level between full-time and adjunct faculty are not statistically significant.

Table 5 presents the average comfort levels of the two faculty groups for the various LMS tools, broadly categorized by their purpose. Comfort level was high (>4) for most LMS features. Comfort level for the video recording tool "Studio," and collaborations within the LMS using Google docs and/or Office 365 were moderate (3–4) or low (<3) for both groups.

Adjunct faculty reported higher comfort levels than full-time faculty for 8 out of 11 features. Results of ANOVA tests, reported in the last column, indicate that comfort levels were significantly different between the two groups at the 5% level for Announcements, Inbox, and Gradebook.

Table 5. *Comfort with LMS Features*

Purpose/Tool/Feature	Full-time	Part-time/adjunct	F (significance)
Content Organization/Creation			
Modules	4.33	4.46	.21 (.650)
Pages	4.26	3.82	1.90 (.17)
Studio	3.16	2.61	2.50 (.118)
Interaction			
Announcements	3.93	4.57	4.16* (.045)
Collaborations	3.14	2.93	.42 (.521)
Inbox	4.00	4.68	4.81* (.032)
Discussions	3.91	4.39	2.50 (.118)
Assessment/Engagement			
Attendance	3.88	4.32	1.69 (.198)
Assignments	4.35	4.75	1.98 (.164)
Quizzes	3.86	3.96	.10 (.753)
Gradebook	4.19	4.79	4.51* (.037)
n	43	28	

* Indicates statistical significance at the 5% level.

Faculty were also asked whether they were using any external applications in conjunction with the tools available within the Canvas LMS. Twenty-one (21) faculty, representing 25% of respondents, reported using Nearpod, and 15 (≈18%) said they were using Kahoot, a game-based learning application.

Research Question #4

How often were various LMS tools used in the four different teaching modalities in Fall?

Our final research question analyzes the frequency of use of various tools and features within the LMS. Faculty were asked to select all modalities in which they were using various tools and features listed in the survey question.

Over 90% of responding faculty reported using assignments, gradebook, and modules. Between 80–90% indicated they were using external videos, supplementary reading material, and "Inbox" (an email tool in Canvas). Between 70–80% were using announcements, attendance, discussions, pages, and quizzes.

Usage of tools by modality is summarized in Table 6, listed in descending order of frequency of use (reported in the last column). Conditional proportions are reported, with proportions calculated as the number of faculty reporting using the tool in each modality ÷ number of faculty reporting using the tool. For example, 80 faculty reported using assignments, of whom 41 reported using it in their asynchronous online classes, yielding a conditional proportion of 51.3%.
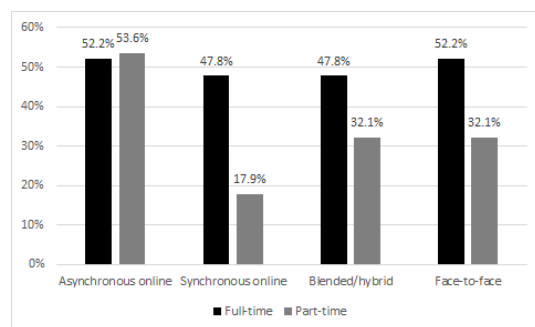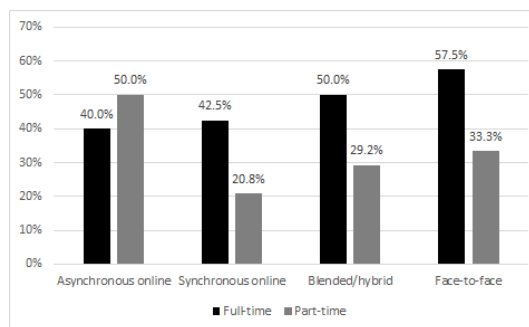
Table 6. *Use of Tools by Modality*

	N = 82 Online	Live video	Blended/ hybrid	Face-to- face	Total
Assignments	51.3%	31.3%	40.0%	45.0%	80
Gradebook	50.0%	32.5%	41.3%	45.0%	80
Modules	52.7%	36.5%	41.9%	44.6%	74
External videos	52.9%	37.1%	41.4%	38.6%	70
Inbox	55.9%	32.4%	36.8%	44.1%	68
Supplementary material	52.2%	36.2%	37.7%	40.6%	69
Announcements	49.2%	29.2%	43.1%	46.2%	65
Attendance	29.5%	31.2%	41.0%	45.9%	61
Discussions	60.3%	27.0%	33.3%	36.5%	63
Pages	53.9%	38.5%	41.5%	43.1%	65
Quizzes	43.8%	34.4%	42.2%	48.4%	64
Studio	43.2%	24.3%	32.4%	37.8%	37
Collaborations	36.7%	33.3%	26.7%	36.7%	30

Use of tools varied widely between modalities. This is not unexpected, as the relevance of a particular tool is related to the modality in which a class is taught. Discussions, for instance, are widely used for student—student and student—content interaction in asynchronous online courses but may be viewed as redundant in face-to-face or synchronous online classes in which discussions can take place in real time. Discussions were used by over 60% of faculty in the asynchronous online mode but only by 27% of faculty in the synchronous online mode.

The finding that usage of all tools was the least in synchronous online classes was surprising. The only exception was attendance, usage of which is comparable in the two online modalities—31.2% in synchronous online and 29.5% in asynchronous online. The less frequent use of all tools in the synchronous online mode compared to face-to-face is puzzling since the only difference between these two modalities is in how class sessions meet; the rest of the class structure expected to be similar.

Differences in usage by faculty status are also noted. The largest difference was in the usage of modules and quizzes (illustrated in Figure 1). Usage of these tools/features was comparable for both groups for asynchronous online classes but much lower in all other modalities by part-time faculty.

Figure 1a. *Usage—Modules*

Figure showing bar chart data: Asynchronous online Full-time 52.2%, Part-time 53.6%; Synchronous online Full-time 47.8%, Part-time 17.9%; Blended/hybrid Full-time 47.8%, Part-time 32.1%; Face-to-face Full-time 52.2%, Part-time 32.1%.

Figure 1b. *Usage—Quizzes*

Figure showing bar chart data: Asynchronous online Full-time 40.0%, Part-time 50.0%; Synchronous online Full-time 42.5%, Part-time 20.8%; Blended/hybrid Full-time 50.0%, Part-time 29.2%; Face-to-face Full-time 57.5%, Part-time 33.3%.

Discussion

Integration Into the Literature

Educational institutions all over the world made the emergency switch to remote teaching in March 2020 in response to the pandemic. The studies by Alquabbani (2020), Ardiyanto et al. (2021), and Müller et al. (2021) indicated that the transition was relatively easy for institutions that had basic experience with online learning and/or some prior experience using an LMS. Prompt institutional response also helped ease the transition (Benito et al., 2021). However, the emergency remote teaching time period provided limited opportunities for some best practices to occur, and the result included some negative experiences (Aguilera-Hermida, 2020; Colclasure et al., 2021; Roy & Covelli, 2021).

Crespín-Trujillo and Hora (2021) outlined that instruction at community colleges was severely impacted by the pandemic. Based on their review, the authors recommend that (a) factors influencing community college faculty's use of instructional technology be documented and addressed and (b) that new and accessible professional development matching faculty interests and needs be provided. They also noted that the current system at community colleges focused on support and resources for full-time faculty and that the sudden pivot to remote teaching had made it clear that this is not sustainable. Many four-year institutions may have come to the same realization. This institution made all training sessions available to both full-time and adjunct faculty. It also provided all faculty access to the Canvas course created as a repository of online teaching resources. Comparison of comfort levels indicated some differences between full-time and adjunct faculty. A follow up study could conduct more comparisons between adjunct and full-time faculty use and comfort with these tools as well as the possible link to student outcomes.

The multi-week schedule of professional development sessions and creation of an online repository were not unique to this institution. Some have continued to offer their workshop series once or twice a year (Kuntz et al., 2022). The availability of tools is continually changing (Yoshida, 2018); Zoom, for instance, added a whiteboard tool to its video conferencing platform in April 2022.

Concerned about the lack of engagement with students during the emergency remote teaching phase, faculty at higher education institutions, in general, felt more confident about the learning experience they would deliver in Fall 2020 (Lederman, 2020). How faculty have continued to use and develop their skills would be interesting to document in a follow-up study.

Results showed low faculty comfort level with some tools, especially in video conferencing platforms. Heldt et al. (2021) similarly found that an hour-long training in a medical residency program resulted in greater use of less technologically advanced tools—trust generators and storytelling—than clicker systems, real-time

collaboration and breakout rooms. It is possible that over time, comfort level with the more advanced tools would increase. It would be interesting to study the connections between continued professional development and the use of more advanced features. As Kumar et al. (2019) indicated in research before the pandemic, the use of these types of tools were helpful for students. How did the pandemic change users' familiarity with these tools and their desires to interact with these types of tools?

Prior to the pandemic, literature supported the idea that planning is required to effectively teach online (Kumar et al., 2019; Simonson et al., 2019). The findings documented in this study can provide a baseline for how faculty skills can continue to grow going forward. Experienced faculty at this institution were willing to provide a "by faculty, for faculty" professional development experience. Colleges lacking in-house expertise could invite faculty from other institutions to conduct the training.

Limitations
The generalizability of the findings of this study are limited to the extent that the type of targeted professional development required for planned remote teaching, as well as its effect, will vary by institution. Our findings are generalizable to comparable institutions that already had an LMS and had some faculty with online teaching experience while a large proportion primarily taught face-to-face prior to the pandemic. Also, we did not collect information on prior experience with online teaching or educational technology and thus cannot offer insight into differences in comfort level or use of tools based on prior experience.

The biggest limitation of the study is that it cannot separate out the effects of experience gained from half a semester of remote teaching in spring from those of the training. From an institutional perspective, whether such separation is necessary or would yield much insight is unclear. What is more relevant is that the resulting increase in human capital can be expected to enhance the quality of teaching post-pandemic.

Implications for Theory and Practice

This study contributes to the growing body of literature about the lessons learned during the pandemic. While some institutions may have been resistant to online teaching prior to the pandemic, as the pivot to online occurred around the world, there are some positive changes that likely should remain. As Bryson and Andres (2020) discussed, the future of teaching may involve blended teaching techniques in both face-to-face courses and online (e.g., synchronous learning).

Professional development programs can include basics such as defining the learners, identifying content, deciding upon what type of media to use, choosing educational materials, and learning the course management system (Simonson et al., 2019). However, further training on ways to engage students and add in multimedia resources, student-driven content, and teacher-driven explanations are also helpful (Kumar et al., 2019).

While this study is certainly institution-specific in its delivery of professional development post-emergency, the results do create generalizable knowledge and lessons learned that might be applicable to like-institutions and other organizations implementing online learning. Institutions that already had an LMS and some faculty with online teaching experience may find value in replicating the cost-effective method of conducting in-house, "for faculty, by faculty" faculty development workshops to train more faculty in the pedagogy and technology of online teaching. The study would also be particularly beneficial for higher education institutions in developing countries who had no prior experience in online learning before the pandemic but may wish to capitalize on the experience gained (Roy & Brown, 2022).

Conclusion

Two years into the pandemic, the likelihood of another campus closure may be low, as COVID-19 seems to be on its way to becoming endemic. Still, for institutions that may have grappled with repeated campus closures over the last two years and/or those planning to incorporate more educational technology in the future, the implementation and evaluation of targeted workshops may serve as a replicable model. It may also help institutions be better prepared for another emergency remote teaching in the future should such need arise.

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