Online teaching effectiveness: A case study of online 4-week classes in a graduate information systems program

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Abstract

The COVID-19 pandemic in Spring 2020 caused college classes to be changed from face-to-face classes to online classes. For some students, this was their first introduction to online courses. The pandemic resulted in many summer classes also to be online. Two graduate information systems courses typically taught in face-to-face four week summer classes were changed to online for the summer 2020 session. The courses used both recorded videos for asynchronous instruction and daily class Zoom sessions for synchronous meetings. In addition, breakout rooms, help sessions, group projects, and peer review were also used in these courses. This case study outlines how various aspects of the classes were changed and shares the results of student surveys regarding their experiences.

Keywords: COVID-19, online classes, disruption, asynchronous, synchronous

1. INTRODUCTION

The coronavirus COVID-19 pandemic in 2020 had a profound impact on all aspects of life including higher education. Colleges around the world transitioned to online instruction in an effort to stop the spread of the virus. Most four-year universities in the United States changed to remote emergency teaching. One survey found 93 percent of institutions changed to online instruction in the spring of 2020 (Johnson, Veletsianos, & Seaman, 2020); however, 70 percent of university faculty had not taught a virtual class prior to the pandemic (Hechinger & Lorin, 2020). Researchers and administrators recognized the unusual turn of events and were hesitant to criticize faculty or their teaching during the pandemic (Johnson et al., 2020). Our institution echoed this idea and stressed that faculty needed to be forgiving of themselves and also extend additional consideration and kindness to students during the turbulent time.

Discussions now turn to what is next for higher education. In the fall 2019 term, 15 percent of the total undergraduate population took all classes online (Hechinger & Lorin, 2020), and the percentage will likely be higher in fall 2020. Many see the sudden change to online as an emergency issue (Hodges, Moore, Lockee, Trust, & Bond, 2020). Others view the switch to online for Spring 2020 as a great online experience that will serve as a way to foster better teaching and learning practices (Shinn, 2020). There's little doubt that the pandemic will change higher education practices.

Currently international students make up 100 percent of the students in a M.S. in Information Systems program at a regional state university in

the Midwest. International students are generally restricted to enrollment only in face-to-face classes. This requirement was relaxed for international students, allowing them to take online courses in 2020. The COVID-19 situation led this university to change all summer courses online so the two required summer courses, Project Management in Business and Technology and Professionalism in the Information Systems Environment were quickly moved to an online format. Results of student surveys provide insight into what worked well in these online classes. This case study begins with a brief literature review related to COVID-19 and online course development. Then the format and delivery of the two courses are outlined and the results of the surveys shared.

2. LITERATURE REVIEW

Given the disruptive nature of this change to online learning, higher education is experiencing emergency remote teaching, "a use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated" (Hodges et al., 2020, para. 13). The classes that were suddenly moved online should not be compared to well-designed online classes. The typical time to plan and develop an online course is six to nine months prior to teaching the course with the instructor getting comfortable with the online environment in the second or third iteration (Hodges et al., 2020). While many faculty members are accustomed to teaching solo, good online classes are often developed with a team approach, including instructional design specialists (Shinn, 2020).

Changing from face-to-face instruction to online teaching requires the instructor to alter nearly every aspect of teaching. They should not use a standard lecture and notes and deliver it online (Shinn, 2020). Faculty need to be prepared to alter their content and delivery. This may mean incorporating some flipped classroom practices where students review material before a synchronous class session. Faculty with experience with flipped classrooms may have fewer challenges moving online as those without that experience (Shinn, 2020).

Current articles outline some of the practices that faculty used in the emergency remote teaching Spring 2020 semester. A big question for faculty was whether to require synchronous sessions or allow students to work on their own with asynchronous content. Baker, Unni, Kerr-Sims, and Marquis (2020) found that students did not support Zoom sessions as it reduced the flexibility that students wanted. Another student survey of an anatomy class found that 62.2% of the students wanted asynchronous content such as videos uploaded to YouTube (Roy, Ray, Saha, & Ghosal, 2020). Aragon and Wickramasinghe (2016) determined that the number of videos that students watched positively impacted student performance. Scagnoli, Choo, and Tian (2019) also discovered the use of videos positively influenced learning experiences and that graduate students were more likely to watch videos than undergraduate students were. Others recognize that synchronous sessions are sometimes necessary due to the nature of the activity. For example, a group working on a simulation needs to meet online at the same time (Kreie, Johnson, & Lebsock, 2017).

Many used breakout rooms in Zoom as well as online collaboration tools such as Google Docs for student teamwork (Yager, 2020). In a survey of 897 university faculty, 83 percent used their institution's Learning Management System to distribute material, 80 percent used synchronous video tools such as Zoom, Google Hangouts, and GoToMeeting, and 65 percent generated their own content by created videos and allowing students to access on their own time (Johnson et al., 2020). Sixty-four percent stated they changed the assignments or assessments that were previously planned, and 48 percent lowered their course expectations (Johnson et al., 2020).

Clearly, lots of changes were necessary to accommodate the emergency remote teaching required. Many faculty faced the additional challenges of holding student attention in an online environment. It is not surprising that online education deals with attention span issues as students are tempted to multitask while attending online classes (Govindarajan & Srivastava, 2020). Academic integrity also is an issue for a class that is suddenly moved online as teachers need to determine how to protect exams and use tools to deter cheating (Hechinger & Lorin, 2020).

The switch to online learning for students may have provided some positive impacts. Yager (2020) said that students can grow into more independent and self-regulated learners, and quiet students might find their voice through the

online environment. In addition, the pandemic allowed some students more time to study and become more reflective in their school work. One of the biggest challenges for students was the availability of dependable, high-speed Internet service. Faculty should be aware of this and find out from their students what kind of technology challenges they may face (Johnson et al., 2020). Disrupted Internet connectivity in India was the largest constraint in the online anatomy class (Roy et al., 2020). Unfortunately, online education tends to amplify the digital divide as some students have computers, devices, broadband connection, and a quiet place to work on online classes while other students lack these necessities (Govindarajan & Srivastava, 2020). Faculty need to be aware of these challenges that students may face when they are not in the classroom.

3. FORMAT FOR PROJECT MANAGEMENT

Spring 2020 courses all finished online. Immediately following spring courses, the summer Project Management 4-week course began. The Project Management course covers the skill set needed to successfully lead an information system development team in effective project management using the constraints of scope, time, cost, and quality. Current behavioral and technical tools of project management were presented within the context of the information systems development process. Some of the work required the use of workgroups and teams.

Before the course started, video lectures for all chapters and software tool tutorials were recorded in VidGrid and posted in the Canvas course site. VidGrid is an external tool available through Canvas that allows for easy screen recording with voice and an option to have machine-translation done for the required closed captioning. The length of videos were between 5 and 30 minutes. The goal was to keep most lectures under 15 minutes so that students would maintain interest when watching the videos. For the longer videos, the chapter function in VidGrid was utilized. Students were able to quickly go to the part of the chapter they were be interested in reviewing.

The class used a team-based learning structure where students were assigned to teams of 4-5 members. The teams remained the same for all projects and discussions. Daily study plans were sent to all 37 students at the beginning of the course. Students were required to review the lecture slides and reading materials and watch the videos before the class meeting. In the daily 40-minute Zoom class meeting, the instructor summarized the knowledge points and answered students' questions. Pop quizzes were randomly given during the daily Zoom sessions to assess the students' study progress; the quizzes were administered through the LMS, Canvas. Then students were grouped into breakout rooms for team discussion and to work on their team project. The Zoom platform has breakout rooms which allow the leader to randomly or deliberately assign students to smaller groups. In the breakout rooms, students can only see the other members in their room. Students in breakout rooms can request to have the instructor join their room. The instructor visited different rooms and joined team discussions.

In addition to the mandatory daily Zoom class meeting, there were two separate Zoom help sessions led by teaching assistants (TAs) every day. It was optional for students to join these sessions. To ask for further assistance, students could send emails to the instructor or TAs. Individual students or teams could also invite the instructor to an additional Zoom meeting to discuss assignments or projects.

Students were expected to complete many group activities. Teams were given daily discussion questions, and they submitted discussion reports right after the Zoom class meeting. There were two group assignments, requiring students to practice different group coordination and communication tools. Teams applied all these tools to their group projects, following five milestone requirements. Team presentations were done via Zoom. Every team recorded its Zoom presentation and submitted to the course Canvas site.

Three exams were given to students for course assessment. Students were required to use Respondus LockDown Browser plus Webcam to take the exams. This tool worked well for remote proctoring.

This online course required students to practice both self-study and teamwork. By applying different online tools, all students successfully completed this course within 4 weeks. Course assessment methods were almost the same as the face-to-face course version. The only difference was the presentation. Students did not have chance to present in front of the whole class.

All presentations were completed via Zoom recordings by teams.

4. FEEDBACK TO PLAN SECOND CLASS

Towards the end of the Project Management course, a survey was sent to all students to get some feedback to help plan the second course, Professionalism. Since Zoom sessions were used in the Project Management course, the students were asked about the number and length of those sessions. Most students (58 percent) thought one session should be required daily while 42 percent thought 2-3 Zoom sessions should be required daily (Monday through Thursday). The majority (61 percent) of the students thought Zoom sessions should last 30-40 minutes each.

The students were also asked an open-ended question about how the Zoom sessions with approximately 40 students were working. Over 87 percent of the students said Zoom sessions with 40 was okay; some cited that the number of students didn't matter while others mentioned that they liked hearing everyone else's questions. Most students did not have concerns ahead of the class. Another open-ended question asked about what was most important for them to have a good learning experience. The most common responses (in order with highest first) were course interaction with students and teacher, recorded videos, ways to get help, details on assignments, and good communication.

5. FORMAT FOR PROFESSIONALISM

Using the data from the survey, the content and delivery for the Professionalism course was moved to online. The course includes IT ethics, job search materials, and business communication. Prior to the course beginning, video lectures were recorded for each of the 10 chapters in the Ethics book. These were done in VidGrid in the Canvas LMS and included a script for closed captioning. Each lecture was about 20 minutes. Students were to watch these on their own. Two quizzes and one exam were given that included questions about ethics. In addition, some class discussion and essay questions also used the ethics material.

In the one required daily Zoom session, the instructor reviewed resumes, cover letters, interviews, and oral and written communication topics. Nearly all students had perfect attendance at these sessions. A graduate assistant was also in the session to help with attendance and keep up with the class material and announcements.

Breakout rooms were used for three activities: peer review of job materials, practice writing business messages, and discussion of ethics situations. During the peer review sessions, the entire class started together in one Zoom session where the requirements were covered. Then students were randomly put in breakout rooms with 4 or 5 students. The instructor visited each breakout room and often reviewed a cover letter or resume so all students in that group could hear feedback. The students shared their screens with each other during peer review. When practicing writing business messages, students were given a situation and had to respond with an email. They wrote their email in their breakout room and then submitted it to Canvas. These were graded and the best ones reviewed in the following day's Zoom session. For the ethics discussions, each breakout room was assigned a situation to discuss. Then the students would return to the main session and share their answers or they would submit their written answers to Canvas. The breakout rooms often took longer than anticipated and the Zoom sessions lasted longer than the planned 40 minutes. Most Zoom sessions lasted approximately 75 minutes.

The etiquette luncheon with a meal and a speaker to discuss the rules and allow the students to practice changed to a Zoom session with a guest speaker on dining etiquette. Mock interviews were also done via Zoom. The students had a pre-interview Zoom session with a graduate assistant right before their mock interview to make sure they had appropriate dress and materials ready and to answer any last minute questions. Then the student met with a business professional for a mock interview.

Students were able to get help with assignments in various ways. They could send emails to the instructor or graduate assistant. They could have individual Zoom sessions with the instructor. Several of these sessions were conducted for resume and cover letter review. There were also two daily Zoom help sessions led by the graduate assistants.

The class presentations were probably the most challenging to adapt to online. Students did two elevator pitches and one ethics presentation. For all three videos, the students had someone else video them giving their presentation and then the file was uploaded to Canvas. Students were

graded on presentation skills so they had to be in the video. The ethics presentation required a PowerPoint so the students had to show the PowerPoint on their computer, another monitor, or a TV as they gave the presentation.

While some activities worked similar to the face-to-face class, some suffered in this online format. The peer review of cover letters and resumes was not as effective. Students usually print these documents so others can write on them. The instructor typically moderates this entire session, telling them what to look for and change as they are reviewing each other's documents. In the breakout rooms, they were not able to write on other's files and seemed hesitant to make suggestions. The students were not required to watch the other student presentations so they missed giving and receiving feedback from their peers and incorporating audience interaction as well as the actual experience of giving a presentation to an audience. Also the students missed the chance to practice dining etiquette with an etiquette luncheon.

6. DATA ANALYSIS

Question 5 = Strongly agree 4 = Agree, 3 = Neutral 2 = Disagree 1 = Strongly disagree	PM Mean 1-5 scale n = 37	Pro Mean 1-5 scale n = 27
Like online more than F2F	2.92	3.07
Zoom class meetings were effective	3.84	4.33
Chapter videos helped me understand course content	3.70	4.04
Online Zoom help session was necessary for class	4.08	4.26
It was not difficult to get help from instructor or GA	4.31	4.22
Could always reach out to instructor or GA for help	4.38	4.41
Effective to do group work w/ online collaboration tools	4.11	3.89
Liked using breakout rooms for class discussion	N/A	4.48
Breakout rooms for peer review were helpful	N/A	4.26
Breakout rooms for group or team work were effective	4.26	4.26

Table 1: Mean scores by class

The instructors gave an optional anonymous survey at the end of each 4-week summer course. Thirty-seven students (100 percent response rate) took the Project Management survey and 27 (73 percent response) took the Professionalism survey. Means for the various questions were generated to see which ones were highest. Two of the questions regarding breakout rooms were only included in the Professionalism survey.

The mean scores and scale are listed in Table 1. The first question asked whether students liked this course as online more than face to face. The scores were neutral, indicating they did not have a strong opinion about this. Overall, students in both classes liked the Zoom class meetings, were able to get help from instructor and GA, believed online Zoom help sessions were necessary, and liked using breakout rooms.

Instructors were interested in knowing whether students actually used the videos that were created prior to the beginning of each class. The analytics for the videos were not available so the researchers had to ask the students about their use. The responses are shown in Table 2.

Response	PM	Pro
Watched all videos	38%	22%
Watched most of videos	30%	41%
Watched some videos	13%	29%
Watched a few videos	19%	4%
Did not watch any videos	0%	4%

Table 2: How many videos students watched

The students were also asked how they interacted with the videos. Of the students who watched any videos, Table 3 shows how they watched them.

Response	PM	Pro
Watched parts interested	27%	31%
Randomly skipped	5%	15%
Watched begin to end	68%	54%

Table 3: How students watched videos

The videos in the Project Management course utilized the chapter function, allowing students to quickly get to a certain part of the video. The students were asked about their use and opinion of this feature. The results are in Table 4 and clearly show that the chapter feature should be considered for use in future videos.

Response	PM
Did not know about chapter feature	3%
Did not use chapter feature	13%
Chapter feature was useful	81%
Chapter feature was not useful	3%

Table 4: Chapter feature in videos

Students had the option to share comments about what they liked about class and what they would like to have changed. The answers to these questions were analyzed to determine the most frequent comments.

In the Project Management course, students commented that they liked learning knowledge and gaining practice in handling a project, but many wished the course could have been longer than four weeks. In the Professionalism course, student comments were generally positive with several mentions of learning a lot about professional topics, good class activities, and the improvement in their resume, cover letter, and mock interview skills. There were only a few random comments about things to improve including making sure all students participate in breakout rooms, exams, and providing more feedback.

7. DISCUSSION OF FINDINGS

The data analysis results provide insight into important factors for future classes. First, well-prepared online materials are necessary for students to conduct self-study. Video lectures, daily study plans, and detailed instructions can provide students with comprehensive help.

Second, appropriate online coordination and communication software and tools should be applied to help students complete course activities. Zoom, VidGrid, Respondus Lockdown Browser, Google tools, etc. were successfully used in this case. Using these tools, students completed all coursework with little or no communication or coordination difficulty.

Third, flexible instructional methods can meet the needs of online students. Synchronous Zoom class meetings and asynchronous activities were both conducted, and students responded that they were effective. In addition, the use of breakout rooms was rated positively and should be continued and/or expanded in the future.

Fourth, communication is important for the online course success. Students have less chance to directly meet with the instructor in an online course setting, but they may need more assistance to complete course work. The set of communication methods including synchronous class meetings, help sessions, group discussions, individual meetings, announcements, and emails can help meet communication needs. The results showed that students were satisfied with the various communication opportunities.

While the results of the case study may provide some insight into the effectiveness of various components of our compressed online summer classes, these results cannot be generalized to apply to other institutions and to courses taught in a regular 15-week semester.

8. CONCLUSION

Students in this case study did not demonstrate a strong preference for online or face-to-face classes when asked in the survey. In the open-ended comments, a few said they "always want face-to-face classes" and "in-person classes are always better" so there is likely a preference for face-to-face instruction for at least some of the students. These comments are not surprising as other studies have found students preferring face-to-face classes. Peslak, Kovalchick, Wang, and Kovacs (2018) studied students from three universities and found students preferred the face-to-face course delivery method was over online. Yager (2020) agreed that face-to-face teaching will be favored over online due to the human connection.

The motivation for moving these classes to an online format was due to population health concerns. In one recent study, 80 percent of the students were not in favor of continuing online after the pandemic subsides (Roy et al., 2020). Regardless of the format of the courses in the future, lessons learned from this case study will help in setting up and implementing future courses.

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Editor's Note:

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