


Practical Considerations for Transitioning a Professional Short Course Online

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Abstract: Higher education programs are rapidly transitioning online in support of a broader geographic base, working professionals, and, recently, emergency contingencies such as COVID-19. The flexibility of online courses makes them attractive to adult learners; as such, there is much academic discussion about online learning for adult learners and the conversion of courses to an online format. However, most of these discussions are based on traditional higher education courses. This article discusses some of the specific practical challenges in the conversion of professional short courses for adult learners. The challenges relate to instructor isolation, student preparedness, and student support. Proposed solutions to these challenges are drawn from direct instructor experience of

converting a STEM professional short course to an online format. Solutions included increasing the number of instructors and providing pre-course sessions to help resolve some technical difficulties before each class began.

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PROJECT FACILITATORS CONSIST OF INSTRUCTORS RESPONSIBLE FOR DIRECT INSTRUCTION AND A SUPPORT TEAM THAT HELPS WITH ADMINISTRATIVE AND TECHNICAL CHALLENGES.”

Keywords: online learning, continuing education, professional learning, short course

Introduction

Online learning requires access to learning experiences via computer technology and it is a more recent version of distance learning (Moore et al., 2011). Online learning improves educational opportunities, especially during extreme events like the COVID-19 pandemic (Jovanovic et al., 2022). The COVID-19 pandemic had a significant impact on the rate of conversion

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of courses and curriculum to online learning environments when up to a billion learners' in-person learning experiences were disturbed (United Nations Educational Scientific and Cultural Organization, 2021). This conversion of courses includes those utilized by adult learners, including professional short courses. Given the pervasiveness of this conversion, there is merit in studying it. This paper focuses on one aspect of adult learning: a discussion of some of the practical challenges in converting professional short courses to an online learning format.

Since online learning came into existence, there has been discussion of its effectiveness and structure in the academic literature (Berge & Muilenburg, 2000; Spencer, 2004). There is evidence, from an assessment performance point of view, that there is little difference between online and in-person learning (Kortemeyer et al., 2023; Neuenschwander et al., 2013). However, there has been an acknowledgment in the literature that material and course design for adult learners benefit from being different for line and in-person learning (Grimes & Walters-Sach, 2024; Mckenna et al., 2020). This paper attempts, in part, to understand these differences in the context of a professional short course.

Online learning presents some unique and complex challenges for adult learners (Nwabuoku, 2020), with Collins (2020) arguing that any challenges adult learners experience should be understood from various perspectives; that is, research benefits from being interdisciplinary and seen through different theoretical or practical perspectives. Through the lens of a short course conversion, this article provides a distinct perspective on online courses for adult learning, separate from the traditional higher education setting.

Online courses provide flexibility that is attractive to adult students (Korstange et al., 2020); as such, it would be expected that online courses would be popular with adult learners, which is evident by the fact that before the COVID-19 pandemic, the average age of online bachelor students was 32 years (Friedman, 2017) which implies that most online bachelor students

were adult learners. Given this prevalence of adult students in online courses, Iloh (2018) suggested that adult learners are the normal type of students to expect in an online classroom. As such, studying adult online learning is a useful activity to provide research that might better help these adult learners.

Studies have considered adult online learning from a wide variety of perspectives, including refugees (Gage, 2021), first-year online experience (Korstange et al., 2020), and mental health (Nwabuoku, 2020). However, such scholarship traditionally focuses on courses embedded in degree programs offered by institutions of higher education. The research presented in this paper focuses on professional short courses. Although our professional context is grounded in engineering and STEM, with previous research being conducted on online transitioning in both areas (e.g., Felder et al., 2021; Lopez et al., 2022; Prada, 2021), for this article, the observed practical challenges of online course conversion are considered more broadly in hopes of adding to the literature on provision of adult learning and the increased presence of online learning.

The Professional Short Course

In this section, a brief description of the course that was transitioned from an in-person to an online format during the COVID-19 pandemic is given. This course, whose subject area was data management, provides the backdrop for our discussion on the transition to online learning. This course is part of a series of four one-week-long professional-level courses for the U.S. Navy that focus on data analytics and modeling. Students explore different datasets using data analytics techniques to gain useful information about the analyzed data. Data analytics encompasses statistics, computer science (especially machine learning), and information systems (especially data management and visualization). It is a relatively new discipline, and, as such, there is no consensus on its definition. A simple definition, which is acceptable for the purposes of this paper, of data

analytics is *applying algorithmic processes to derive insights from the available data* (Leathrum et al., 2020).

The course discussed in this paper is part of a series of courses that were developed over four years for the project (a project year ran from one October to the next), with a new course in the series being developed each year. Once a course was developed, multiple course offerings were scheduled throughout the year and subsequent years. Hence, each course would be taught multiple times to different classes over the four years. Each class contains approximately 20 professionals. These professionals were all adults, as defined by Hill et al. (2023) as “people who have assumed responsibilities of adult life, as upheld by their culture.” Pre-COVID pandemic, the courses were taught on-location within different cities in the United States, and with the onset of the COVID pandemic, the courses shifted online.

The scheduled development of the courses was data analytics first, followed by predictive analytics, then data modeling, concluding with data management. During each project year, a new prototype course was developed and evaluated before it became part of the course offerings. Some courses require other courses as prerequisites, and some are offered as stand-alone courses. Project facilitators consist of instructors responsible for direct instruction and a support team that helps with administrative and technical challenges. This paper’s background scenario is based on our experiences from redeveloping one of these four courses to an online format.

Teaching in the data analytics courses centers on introducing and practicing data analytics-related education and training. The course material was developed and tested with a prototype course, which is iteratively updated based on the evaluation feedback from course participants and the customer (the U.S. Navy). Teaching materials were primarily based on teaching R (a statistical programming language) (Matloff, 2011) and various data analytics approaches to explore the data.

Both the in-person and online versions of courses covered approximately the same learning objectives, and both were conducted synchronously over a single workweek (5 days), with each day running from 0900 to 1700, with multiple breaks and a lunch hour provided (resulting in a 6 hour work day). All students were expected to attend all the days’ sessions, and all learners covered the same educational material and exercise in each class. Thus, the only major difference between the two versions of the course was the physical location of the students and the technology used to present the material and communicate with the students.

Transitioning to Online Teaching and Learning

Our discussion focuses on three challenges pertinent to the transition of professional short courses to an online environment. These three challenges were selected due to their relevance to professional short courses and the fact that they required a different solution than those found for semester-long, university-style courses. The three challenges are instructor isolation, student preparedness, and student support. The three challenges in this article provide insight into the non-technical aspects of transitioning a professional learning short course online.

We believe these challenges are pertinent to short courses because of the time frames involved. A short course is usually run using an intense, continuous schedule that has limited time between sessions. For example, in our course, which ran for five consecutive working days, the only outside class time was in the evenings. This intense schedule severely limits the ability to handle issues that arise during the class. For example, the instructors had very limited working hours to discuss issues with the course; if a student was unprepared for the course, they would only have Monday evening to address any issues; and if a student required extra support, this could only be provided in the lunchtimes or evening times reducing the break

time available to both student and instructor alike.

Recognizing these challenges, solutions were identified to overcome these obstacles (Freire, 1970/2000). Solutions to these problems were developed through brainstorming meetings, ongoing reflection, and instructional team debriefs.

Instructor Isolation and Belongingness

The academic literature provides discussion on feelings of isolation and belonging during an online course (Brooman & Darwent, 2014; Gage, 2021; Iloh, 2019; Nistor & Neubauer, 2010). However, these previous papers focused on the student perspective. We discovered that these feelings could also affect the instructors. During the original week-long in-person courses, instructors spent significant time together, discussing the course's progress in huddled corners during course breaks or over evening meals. The online format removed both of those options. This lack of face-to-face interaction removed opportunities to quickly address minor problems and discuss each instructor's perception of the class; this increased feelings of isolation among the instructors. This is especially true when a team of instructors teaches a short course because of the compact nature of the course schedule.

During online teaching sessions, unless an instructor explicitly asked for assistance, it was difficult for other instructors to recognize if they needed to provide support. As such, it was vital to provide as many avenues for communication as possible. Several strategies were employed to do this. First, it was found beneficial to have at least two instructors online at any given time, with one actively teaching. A dedicated "instructor only" instant messaging channel was created in the Learning Management System (LMS), which was easily accessible by all instructors. Additionally, at the end of each teaching day, instructors convened for instructor-only discussions. This was not as effective as the previous in-person interactions,

but it did allow time and space for the instructors to remotely engage with one another. Finally, one-to-two weeks after each course concluded, instructors met to debrief course enactment and the student learning experience.

Though the implementation of these strategies enabled instructors to support each other during the class, the structure did not allow for informal bonding between instructors. It is known that this informal bonding produces a more coherent and effective team (Henttonen et al., 2014). The management team tried to conduct social events; however, the instructor team was not receptive to such social events or team-building exercises in a digital environment. As such, one-to-one social interactions were relied upon to build bonds between the instructors.

It could be argued that the new tools could have been used to build bonds between the instructor team and decrease the social isolation felt by the instructors; for example, social media or instant messaging tools. Others have effectively used social media to improve the social part of the teaching experience; for instance, Northey et al. (2015) increased engagement in undergraduate marketing students during an online class by incorporating a Facebook page as a supplement to the lecture material. However, such an approach does not necessarily translate to different personality types (Kroeger et al., 2002) commonly found in an engineering classroom. None of the instructor team regularly used social media apps, and most instructors ignored the attempt to introduce a new platform for communication (a "slack" channel). Social media tools were not useful for our instructor pool. To re-emphasize this point, the lead author's main professional engineering society, with 50,000 members, recently removed their social media instant messaging and list server capabilities due to lack of use. Though social media has been effective in other teaching domains as a means of engagement (e.g., Northey et al. (2015)), it does not mean it is applicable in our particular circumstance because it is not commonly used by the instructor pool.

There was a serendipitous event that did allow for some instructor bonding. A subgroup of instructors conducted a self-study, a form of reflective research (Bullough & Pinnegar, 2001; Lynch et al., 2021), to better understand the transition from in-person to the online version of the data management course, under the guidance of a critical friend (Collins et al., 2023); with this paper being one of the artifacts produced from that self-study. An unforeseen benefit of the self-study was that it enabled the instructors to interact outside the class and discuss deeper teaching issues beyond the usual logistical concerns. Partaking in the self-study allowed for instructor bonding to occur, which was an unforeseen benefit of that effort.

Due to the instructors' unwillingness to engage in instant messaging/social media platforms, there was limited out-of-class communication between instructors. However, the project management teams scheduled several meetings and, personally, visited the instructors between courses to provide a means of discussion and connection.

Student Preparedness

An online teaching environment requires students to be better prepared for the class itself, especially regarding technology access (Grieves et al., 2022). One important aspect of this preparedness is being prepared to use the technology required for the class. Being online, the students no longer had access to the technology provided by the project team. Instead, they had to rely on personal technology tools or those used at work, which often did not align with the ways in which instructors had initially designed the learning experience. There was now a further requirement to ensure that students could use the LMS and have all the necessary technology prerequisites (i.e., a working camera). Resolving technology challenges from the students tended to occur at the start of an online class. The primary issue was that for an instructor to intervene with computer technology challenges, the students' means of accessing the course were removed as their computer issues

were diagnosed. Thus, students missed important introductory course information and, in severe cases, got behind on the technical context of the course material. In a fast-paced week-long course, getting behind at the start can be troublesome. The high technology prerequisites of an online course, compared to an in-person course, mean that, inevitably, there are more technical challenges that need to be overcome to ensure an effective learning environment is created.

There were four strategies employed to mitigate these student support challenges: a robust setup document, better communication with student recruiters in the customer's organization about the nature of the course, a short lecture at the start of the course about using the LMS, and increased preemptive support.

The introductory setup document for the course was heavily revamped to ensure it was both clear and comprehensive. The intent was to provide students with a document they could follow without instructor support, and it was well-received by the students.

A prior series of meetings with the instructors meant that the customer/student coordinator could relay requirements to the students before the start of each course. This additional time burden was challenging to place on our adult learners because even though adults are defined as people who have assumed responsibilities in their lives (Merriam & Baumgartner, 2020), adults must prioritize those responsibilities, and preparing for a company-paid course might not be a high priority to them. The alternative was to reduce the material covered in the course to accommodate more time to handle this unpreparedness; however, the customer was unwilling to consider this.

A short (10-min) lecture was provided at the start of the class, which reviewed all the material and technology usage expected of the students to know beforehand. The expectation was that this would act as a reminder to the students of that material. The lecture was also designed to

establish the fast pace of the course, which required students to focus on the material.

The most significant change made to help with student preparedness was the introduction of preemptive support. Two pre-course sessions are now run in the weeks before any course. These sessions allow students to understand the course format better, meet a member of the instructor team, test their connectivity, get a walk-through of the LMS environment, and address basic technology challenges. In theory, students should be familiar with the LMS system used, as this was why the LMS was chosen in the first place, but this was not always the case, so basic introductions had to be occasionally made in these preemptive sessions. These preemptive support sessions are like the “town hall” approach advocated by [Bhatti and Heffner \(2020\)](#).

Though useful, unfortunately, these pre-course sessions do not address the numerous technical challenges students encounter that require instructor intervention. Other problems persist. For example, even though pre-course sessions are offered and highly encouraged, it was found that some students assumed that the first day would be an “easy day” and that they could resolve their technical difficulties then; as such, they did not attend these sessions. The instructor team tried to nudge ([Halpern, 2015](#)) the students to attend these sessions, that is, by including in one of the introductory emails to the students that “90% of students that have technical difficulties did not attend the pre-course sessions.”

One of the significant issues that we faced in the week-long course was that students would have work commitments they needed to handle; therefore, we would periodically lose a student for a short period of time. It was discussed that the course could be split over several weeks. The main objection to this split was the concern (and fear) that the students would “forget” the material due to their refocusing on usual work requirements, and, thus, they would need a refresher on the previous material at the start of each session (we felt, based on previous experiences, that the student would not be motivated enough to conduct their own reflection

and refreshment). For student learning, this review of the previous material at the start of each session could be considered spaced repetition and, as such, from an andragogy point of view, we would have welcomed the format change; however, this approach would have required either less educational content to be taught or more sessions required; neither option was acceptable to the customer (nor was it feasible due to contract restrictions).

Student Support

There are several advantages to providing technical support during in-person classes as opposed to virtual support. In-person, the instructors can provide previously set up computers for students to use, provide direct hands-on support to help students resolve technological issues, or take direct control of the students’ computers if they have severe technological challenges. If the supporting instructor takes control of a student’s computer, the student can still follow along with the current lecture. These advantages to technical support were not possible in the virtual environment, so we relied on better preparedness for the instructors and students.

Even with better preparedness, challenges still occurred during the course. These included technology challenges, as well as learning support challenges. To handle these challenges, extra instructors were made available to help the students one-on-one. This approach to handling challenges, unfortunately, meant taking students away from the main lecture to a private online conference meeting (which was called a breakout room) because there was concern that dealing with one student’s challenges would disturb other students. Where possible, instructors pushed these private support meetings to break times to avoid the students missing out on course lectures. Having conducted the course several times, it became apparent that certain parts of the course were prone to requiring more student support than others. As such, more instructors were scheduled to be present during these critical times, such as

during the beginning and practicum sessions. Having multiple support instructors meant that some of the instructors could float between breakout rooms to check if the instructor giving support also required support themselves. The use of breakout rooms was effective in most cases. But, other technical difficulties, such as connectivity, could not be addressed using breakout rooms. For instance, during a recent course, a storm passed a student's location and negatively impacted their online connectivity for a time.

Given these limitations, a decision was made to further reduce the content of the class to remove some of the submodules that were likely to cause problems. For example, a module that used an interfaced Python program was removed, as this would require the student to install the Python programming compiler onto their computers, and installation of any new software is a likely source of technical problems.

Conclusions

This article presents three challenges faced when transitioning a short course to an online environment from the point of view of instructors to adult learners, and it presents our approach to handling these challenges and the practical implications of these solutions. It is hoped that highlighting these challenges and potential solutions will help others if they must convert a professional short course to an online version, for which there is a demand at present (Larson & Farnsworth, 2020).

Some fundamental changes to the course, based on these challenges, were increasing the number of support instructors present at key points during the course, ensuring instructors interacted amongst themselves online to support instructor bonding, providing separate private online meetings with instructors and any students having technical or epistemological difficulties, and providing pre-course sessions to help resolve some of the technical difficulties. These changes were vital to ensure the short course remained at its fast pace and was not mired in technical

difficulties. By acknowledging these considerations, the project highlighted in this article was awarded the 2022 Department of the Navy (DON) Information Technology (IT) Excellence Award in workforce development and empowerment for its converted online courses.

The circumstance of the project, with which the classes were funded, allowed some of the solutions to be enabled, for example, channeling more instructors to a course. We accept that not every course developer will be in such a privileged position to enact this change, and that is a limitation of our approach.

Another limitation of our approach was the technology of the LMS satisfied the needs and requirements for our online transition; however, the whims of the LMS provider determine the functionality of the LMS, and there might be some loss of functionality due to provider changes. For example, the reliability of our LMS has degraded with time.

The three challenges discussed in this paper (instructor isolation, student preparedness, and student support) were not the only ones encountered during the conversion, as others existed that were either highly technical or unique to our circumstances.

The implication of this paper is that our approach to course conversion required more resources, and even with those new resources, there were difficulties due to unforeseen issues beyond those that are just technology-based, for example, instructor isolation. We would suggest that these challenges would need to be considered in any plan to convert a short course from an in-person format to an online one. Critically, many of the challenges faced were due to, or exacerbated by, the limited downtime mandated by our short courses' schedule; this limited downtime compounded the adverse effects of students having technology issues. Technology issues are even more problematic in the online teaching environment because a student is unlikely to be able to view the lecture while support instructors resolve their computer issues (this is not the case in the in-person

format). From an instructor's perspective, isolation and belongingness can be an issue in the online environment; though solutions involving social media/instant messaging platforms might seem obvious, they will only work if the instructors are willing to engage with them. In our case, the instructors did not regularly use social media and were unwilling to engage further on them, except for direct course-related discussion; this resulted in the need to create new avenues for engagement outside the short course class time, for example, a reflective research exercise. Based on these points, we hope that this paper further highlights the new difficulties that must be overcome to convert a short course to an online format.

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