TEMPLATE FOR SUCCESS: TEACHING TECHNOLOGY AS A LIFE SKILL

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ABSTRACT

In response to the COVID pandemic, there has been a rush to get traditional classrooms pushed into online environments as a means of keeping students safe while moving forward with their educations. There is an exploding need for students to become technologically adept across platforms and devices toward fully understanding and applying high technology as a means of meeting daily operations requirements for employers. This paper presents the COVID-compliant redesign from a teaching team for students who are new to an Information Systems course requiring online interaction as well as competency with workflow product applications. We leveraged technology in a teaching environment to optimize student learning outcomes. The course described here incorporates andragogical best practices for rapid deployment and training transfer.

Keywords: information systems, teaching, life skills

INTRODUCTION

"I can see an application for this in my life! I have never thought about how Excel ties back to my life."
IS2241 Student, Spring, 2021

While the current generation of young college students is noted for being sophisticated about technology, most of the applications (apps) used by teens are not related to the work environment. Instead, teens are adept with apps that promote texting, live streaming/video, microblogs, photo sharing, chatting/dating, and secret chat/share (Common Sense Media, 2021; Pew Research Center, 2012). However, not all new college students are teens. Instead, the pandemic saw adults re-entering higher education to buffer the impact of furloughs and lost career opportunities. While often perceived as not as technologically sophisticated as younger app users, adults are, nonetheless, still well versed in how to use apps for the same reasons teens use them, i.e., to connect and play (Pew Research Center, 2011).

Notably missing from the technology repertoire of many first- and second-year college students is the use of workflow applications, apps that are often used to meet the demands of employment (Valet, 2020). Toward reducing this gap, universities have created information systems courses that are designed to prepare students for jobs that use workflow apps, i.e., Microsoft Word and Microsoft Excel (Longenecker, Feinstein, & Clark, 2013).

The course design being described here was presented by a major university which was an early mover in online education. The first university to provide a bachelor's degree online in 1989 was

a for-profit university. The university referenced in this piece is public and taught its first online class in the mid-1990s. Blackboard (https://www.blackboard.com/) learning management system began in 1997, and this university became one of the beta sites in 2001. The university has a 20+ year history of providing online classes with a substantial international presence. For in-residence classes, this university has a mask mandate for everyone on campus. Per the CDC guidelines, every student is masked during lectures as well as during lab participation and maintains a safe six-foot distance from all others. The course population is primarily freshmen (18-22 years old) for the in-residence environment and adult learners (18-65 years old) in the online environment.

The course has well-defined and assessed course goals and outcomes. The course stresses the importance of a "hands-on" instructional environment as students from various disciplines move through multiple platforms and devices to achieve competency in coursework. While accommodating touch free/social distancing necessities, the course has received substantial positive feedback from students and faculty members. Assessments indicate that a significant majority of all students in this course become competent at using work product software across multiple devices and show a high level of readiness for subsequent courses.

Throughout this article, the moniker IS 2241 is used to denote the course which adopted this pilot project. While the pilot covers multiple sections as well as multiple instructors across terms, the paper alludes to the entirety of the experience as a single event to foster clarity. This is a 16-week course taught on campus that is a requirement for all undergraduate business students. The class is also taught fully online during a 9-week term, and the online course is identical to the 16-week course content with respect to assignments and anticipated outcomes. The 16-week course is taught in a flipped (Nouri, 2016) classroom environment, engaging students to complete the assigned homework outside of class. The in-class work incorporates a hands-on kinesthetic learning environment with instructors and tutors. The nine-week course is taught solely online, incorporating self-study, video, and hands-on projects.

Currently, the pandemic has driven the need for enhanced use of workflow apps as millions of students and employees have moved out of classrooms and offices to work from quarantined quarters. College teachers have been pressed to leave classrooms (Bombardieri, 2021; Li and Lalani, 2020), sometimes over the span of just 3-4 days, to work in a more protected environment, often found online. This paper presents the COVID response for a class which serves hundreds of students each year. Students are new to required course assignments, including online interaction, as well as competency with work product applications.

LITERATURE REVIEW

Although hundreds of years old (Loeng, 2018), the use of andragogy as a teaching philosophy did not fully emerge until the early 1970s when Knowles (1970) made a direct comparison between andragogy, the art and science of teaching adults, and pedagogy, the art and science of teaching children. In citing Lindeman (1926), Knowles (1984) lays the foundation for andragogy. Lindeman's (1926) approach is predicated on five fundamental assumptions that include:

1) Adults are motivated to learn as they experience needs and interests that learning will satisfy; therefore, these are the appropriate starting points for organizing adult learning activities.
2) Adults' orientation to learning is life-centered; therefore, the appropriate units for organizing adult learning are life situations, not subjects.
3) Experience is the richest resource for adults' learning; therefore, the core methodology of adult education is the analysis of experience.
4) Adults have a deep need to be self-directing; therefore, the role of the teacher is to engage in a process of mutual inquiry with them rather than to transmit his or her knowledge to them and then evaluate their conformity to it.
5) Individual differences among people increase with age; therefore, adult education must make optimal provision for differences in style, time, place, and pace of learning (Lindeman (1926), as cited in Knowles, 1984, p. 31).

Knowles (1984) used Lindeman's work (1926) as the underpinning for his own set of assumptions for the andragogical model. The assumptions are:

1) Adults need to know why they need to learn something before undertaking it.
2) Adults have a self-concept of being responsible for their own decisions, their own lives.
3) Adults come into an educational activity with both a greater volume and a different quality of experience from youths.
4) Adults become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations.
5) Adults are motivated to devote energy to learning something to the extent that they perceive that it will help them perform tasks or deal with problems that they confront in their life situations.
6) While adults are responsive to some external motivators, the most potent motivators are internal pressures (pp. 55-61).

Throughout his work, Knowles (1984) stresses the importance of teaching in a manner that uses the student's experience as part of the lesson, so the student will engage more readily with the information. For example, even if students have limited workflow app knowledge, they can build on knowledge from social and streaming apps to help them connect to the principles of workflow apps, often taught in IS courses, that are used in the workplace. Although Knowles (1970; 1984) has been criticized, because his work lacks an empirical base, his work has served as a foundation for adult learning since the 1980s.

One conspicuous difference between pedagogy and andragogy is the nature of the relationship between instructor and learner. With pedagogy, the instructor is often the center of the learner's activities and is a mature authority figure. This relationship is clearly demonstrated in classrooms full of children. Conversely, with andragogy, the instructor is often a subject matter expert (SME) who is sharing knowledge while relying on the learner to be self-directed and motivated. The SME instructor can often become a peer, particularly for mature adults completing graduate studies or continuing education.

McBride and Hackney (2003) believe that information systems (IS) teachers deal with several opposing forces found in the field that teachers are required to balance throughout coursework. The opposing forces are: 1) IS is both analytical and discursive, 2) IS is both certain and uncertain, 3) IS is both social and technical, and 4) IS is both specialist and public. They posit that these characteristics make IS an especially challenging field to teach and suggest that teachers have a set of principles to provide grounding for curricula. They offer a number of principles of teaching IS to support their perspective while also offering competing roles for the IS teacher to fulfill, i.e. teacher as counselor and teacher as theoretician. They emphasize that historically IS has been taught as formal methodology but has evolved to need students to learn soft personal skills as well as logic.

Case, Dick, Granger, and Akbulut (2019) argue that IS instruction should be centered on transformational business models, products, and services that result from the evolution of digitization. They believe that IS, as a field, suffers from an identity crisis that is often furthered by instructors' focus on new technologies as a direction for IS curricula. While trying to keep students abreast of the next new thing, instructors are contributing to the identity crisis that contributes to falling enrollments or to IS courses becoming associated with other programs, i.e., IS for Accountants or IS for Leaders. Further, they note that potential students often do not understand the differences among similar programs including computer science, information technology, and information science. They posit that this lack of identity contributes to courses that are, perhaps, "out of step with business needs" (p. 288) as well as misallocation of resources, because courses are developed hastily and without appropriate analysis of the company to discern needs. All of this serves to lower the profile of the IS courses/program within an institution.

As indicated by McBride and Hackney (2003) and Case et al. (2019), IS presents very real challenges for teachers, and there is no greater challenge than teaching ethics as they relate to IS. Stahl (2011) recommends a framework bounded by "moral intuition, explicit morality, ethical justification, and higher-level reflexivity" (p. 254) to create a foundation for teaching ethics in IS. He stresses the importance of awareness of potential for ethical dilemmas early in the life of information and communication technologies. His perspective posits that ethics are a matter of reflection and without guidance on the nature of ethical issues, it is easy to see how students can become overwhelmed, not to mention compromised, without an ethical framework. He believes that reflection begets reflection such that students will learn to become not only aware of their own ethical positions but also those of others.

Two notable omissions in Stahl's (2011) work must be considered. The first is that he does not make recommendations for how to teach the complex and emotionally laden topic of ethics. His work is positioned as a call for work on developing teaching methods to address ethics in IS classes. The second omission is the lack of consideration of personal values as primary predictors of any student's ethical position. Discussions of values are a cornerstone for ethics education.

Unlike Stahl (2011), Scialdone and Connolly (2020) prescribe a way for IS students to study "fit", the human-computer interaction (HCI), through the use of paper prototyping. Their experiential exercise, grounded in a Constructivist approach, uses common materials to teach students how to foster learning and practice in usability concepts. This exercise was deployed in an early HCI course but is applicable for all levels of IS education to address a shortage in HCI education. Their

exercise includes not only designing a check-in kiosk but also requires role-play between students working in teams of two. As with McBride and Hackney (2003), the focus on soft skills along with hard skills, was considered an important learning point. Role play was followed by discussion. Finally, a focus group was conducted by another professor whereby students were provided the opportunity to express honest feedback without the biasing effect of the classroom teacher. Through focus group feedback and course evaluations as well as personal reflection, the authors claim evidence, albeit anecdotal, supports the use of this exercise for an IS classroom.

Barber (2021) modified courses to address the distress suffered by her students as universities began to close in response to the pandemic. In addition to loss of the face-to-face learning environment, some students lost jobs, housing, and, sometimes, family members as the pandemic spread. Barber (2021) notes that stressors bearing on the problems continued to multiply, and she identifies some of the issues which she faced as an IS teacher:

- Creating a hands-on experience in an online environment
- Moving students beyond memorizing content to applying concepts in the online environment
- Making sure that students themselves (and not someone else) did work or completed an assignment, and
- Managing exams on online proctoring services for students who felt that having a stranger watch them online and see where they live violated their privacy. (p.17)

She cites three important learned points from her experience: 1) Students wanted to learn, regardless of delivery method, 2) Technology is not always going to work the way one needs it to work, and 3) Students have very real concerns about privacy, even with trusted others, e.g. proctoring services. This study is particularly germane to this paper, because we designed the course described here to address many of the issues encountered with IS students since March, 2020.

Taken together, this literature provides a theoretical underpinning for the current design of IS 2241, given that a pandemic forced many issues into the open. The literature tends to be descriptive rather than prescriptive, but worthy of deeper investigation that is beyond the scope of this paper.

COVID-COMPLIANT REDESIGN OF IS2241

IS 2241 is a kinesthetic course with continuous hands-on opportunities throughout class. The instructor lectures only for the first three weeks of the sixteen-week semester. The rest of the time in class is “flipped” and spent doing in-class, hands-on projects. The traditional format requires students to be passive acquirers/users of knowledge while the flipped format requires that students engage with the course for the duration of the course. To do otherwise results in poor course grades.

The move from the traditional class with the “sage on the stage” has been shown to provide a less positive experience for some students while many students report high satisfaction with the flipped format (Nouri, 2016). Nouri (2016) found that students were especially positive about the impact of videos used with the flipped format. Students are expected to complete chapter readings and out

of class assignments before attending the class where, generally, they receive a few minutes of instructions and then spend the rest of the class working in the software applications.

Because the course is normally taught in large sections of 60 to 100 students in computer labs, creating learning pods, e.g. peas in a pod, was necessary to limit class size at any given time to meet social distancing requirements. Each student is assigned into a smaller group that meets with the instructor once a week for the purpose of instruction, feedback, and support while working problems.

Each computer lab holds approximately 100 students; however, during the COVID pandemic the lab capacity is cut in half, such that the maximum capacity is 50 students. The students are divided into POD A and POD B, where each pod contains half the students. The lack of capacity has driven the need for technological interface with students. In the computer lab, each student has access to a computer using Windows 10 desktop, Word, Excel, PPT, Access, Teams, Canvas, and the Internet. Every student has access to OneDrive for online storage through their university accounts. These are all subjects taught during this course. The multiple software platforms required for students to navigate and succeed in the course are explained below.

Canvas

Canvas is the learning management system (LMS) used by the university. An LMS is the foundation or the backbone of a solid student communication system. An LMS contains learning tools that support instructor innovation and student engagement. *Canvas* is designed to be student oriented. The system contains Rubrics, Modules, Calendars, Email, Schedules, Quizzes, Syllabi, Analytics, Grade Predictor and a Speed-Grader. Students use a single sign-on to access Canvas for exams, projects, videos, and other tools. The Canvas Application Programming Interface (API) integrates seamlessly with tools like Google Classroom, MSTeams, MSBookings, Zoom, Adobe, McGraw-Hill Publishing and hundreds of other technology partners to deliver a centralized learning hub.

Microsoft Teams (MSTeams)

MSTeams facilitates the instructor's ability to teach and lecture to both PODs simultaneously. The instructor records the lecture and makes it available to POD members who have difficulty attending the class. POD A attends in person on Monday, and POD B attends on Wednesday. When not in the classroom, the POD has access using Teams concurrently with the in-class Pod. *MSTeams* was chosen, because it consistently rated as an excellent product that is customizable. Students have access to the *MSTeams* App via the university information technology network. *MSTeams* is included as part of the technology fee for all students and layered within Canvas which enables enhanced security.

Instructors use *MSTeams* to hold virtual meetings with students and faculty. Office hours are prominently displayed in the Syllabus, and students can call via MSTeams to initiate a meeting. Generally, students schedule conferences ahead of time using Canvas or Bookings.

MSTeams Chat

Students frequently use the *Chat* feature to communicate with each other and the instructor. Students with an urgent question can speak during class. We find it helpful when the students can stop the demonstration to request a particular task be repeated for clarification. *Chat* allows timely interaction between the student and instructor. Often, students who are struggling need immediate remediation. This feature takes away the frustration of questions being held to the end of a class demonstration.

Early in the move to the *MSTeams* lecture format, the authors discovered that students were logging into *MSTeams* but checking out of the class at the same time. To encourage students to be more engaged and attentive during class times, the authors use a variety of tools. Once the students log into *MSTeams* a list of students is generated to pull attendance. Only students who are scheduled into the POD remote learning or have a university valid excuse are counted in attendance. We use *Chat* with a lecture secret word to be typed in within a specific time frame to confirm attention. Mini quizzes, usually one to two questions on topic, are deployed in *Canvas* to confirm subject retention. Topic surveys with quick responses are also deployed in *Chat*. Students who pose substantive questions or respond to a question with a cogent response are awarded participation points.

The students attend three fifty-minute sessions on Monday, Wednesday, or Friday. Alternatively, the students attend two ninety-minute sessions on Tuesday and Thursday. However, this does not allow time for the students to have in-class testing. We prohibit the use of outside resources during an exam; therefore, a controlled environment is used to administer exams.

Eventbrite

Classroom occupancy restrictions prevent bringing all 100 students back together on Friday at their regular class time. Therefore, the instructors divided the classes into PODs, testing 50 students at a time only on Friday. The instructors use *Eventbrite* (Eventbrite, 2021) tools to create a ticketing system which allows students to choose a test time during the five Fridays designated for testing during the semester. Exams are administered 8:00 am to 3:00 pm, starting on the hour, every hour until 3:00 pm. Each testing period event ticket is broken down into an exam subject, date, and time. Students can register for any available time-period that best suits their schedule. E-tickets are sent to the student via email which serve as confirmation and entrance into the exam period. The exam schedule is published in the Syllabus, published in *Canvas*, announced during class, and appears as the exam due date within the LMS course shell. Students have responded positively to this exam scheduling system.

Students can register for the exams until 4:00 pm of the Thursday before the scheduled exam. This time frame gives the instructors time to produce attendee reports. Students who fail to schedule appropriately are given the Friday 3:00 pm time frame and have a 30% penalty assigned to the exam. Students who do not show for their registered exam time can take the exam during a make-up session with a 30% penalty for submitting the exam late. Make-up exams are not given during the Friday testing periods. Students with appropriate University excuses can schedule for a make-up session with no penalty assigned.

Bookings

Microsoft Bookings (Bookings) is a scheduling tool and is part of the Microsoft Office products. Generally released by Microsoft in March 2017, *Bookings* is an online mobile app. (Microsoft Support, n.d.) *Bookings* makes scheduling and managing appointments seamless, because it includes a web-based calendar that integrates with *Outlook.* There are four graduate assistants providing online tutoring for students. *Bookings* is also used to schedule a tutoring time. The software gives the students and graduate assistants (GA) flexibility in booking a convenient time. Students utilize this software to set up tutoring appointments and schedule make-up exams. GA availability is coded into the *Bookings* software by the administrator. *Bookings* sends the student an automatic email confirmation and a reminder.

Bookings also allows for re-scheduling and cancellations and keeps appointments history up to 120 days. During the COVID pandemic, the *MSTeams* app is used along with *Bookings* to maintain a safe distance during tutoring sessions. *MSTeams* allows for shared screens and provides a personalized experience. We use *Bookings* to provide office hours and schedule online meetings with students and colleagues. A link is embedded in each *Canvas* shell.

SIMNet

SIMNet (McGraw Hill, 2021) is an online training and assessment, auto grading software used with Microsoft Office. *SIMNet* provides students with *lifelong* access and unlimited practice with the Office 365.This platform provides a virtual Microsoft Office environment that is entirely available online using multiple Internet browsers. Students learn and practice Microsoft Word, Excel, Access and PowerPoint in addition to file management, and operating systems content (mheducation.com, n.d.) This gives students the opportunity to work in the actual Office application. This platform is easy to use, interactive, and available with deep LMS integration, and it also mobile friendly. An interactive textbook is paired with simulation activities. Together, these integrate interactive "Teach Me", "Show Me", "Guide Me", and "Let Me Try" exercises that help students with different learning styles to practice and master the Office skills. (SIMNet, n.d.)

These exercises allow the student to work within the applications to create and edit documents. The Teach Me is the content of the page that the student needs to read. If students do not know how to complete steps pertaining to projects, the student can use the "Show Me or Guide Me" to obtain step by step instructions for completing the exercise. The Show Me is a video demonstrates to the student how to accomplish the task and Guide Me is interactive with the instructions.

SIMNet was chosen because of the breakdown of subject matter by task. Kinesthetic learning is incorporated when a student reads a section and then completes a "Try-it" for that small task. Also included are videos for students who are visual learners using the "Show-Me" application. "Guide-Me" breaks down the task and the student must follow the step by step-by-step instructions along with the presenter. The authors only require the "try-it" for a grade therefore students who already know the material can progress quickly through the assignments. Immediate feedback is provided by the software.

Because *SIMNet* is an online tool, students can study and practice from almost anywhere on any device. The instructors focus on working within the application during class time and allowing the students to demonstrate what they learned from class preparation in SIMNet. During the COVID19 pandemic, *SIMNet* has allowed students to continue learning with virtually no interruptions. Students were accustomed to working with an online software, and they progressed seamlessly with their assignments. Through the use of this software, remediation is provided immediately upon submission of an assignment. Students are not waiting for an instructor to grade up to 100 students' projects before getting feedback.

This software provides instructors with quantitative reports for measuring students learning outcomes as well as access data on the cumulative time students have spent on task categories and which areas need more focus. This information gives instructors a snapshot of how much time each student has spent in *SIMNet* practicing and completing individual assignments. The software allows for the creation of exams that can target concepts, as well as exhibit the actual applications. The instructors have created up to five exams for each subject for each semester. The exams administered are rotated each semester, one exam is administered on the regularly scheduled exam date and the second exam is used as a make-up exam. At the beginning of the semester these authors decide on which exams to use. One becomes the regular exam and the second exam become the make-up exam. This keeps students from conferring about what is contained on each exam.

The instructors have received numerous testimonies from students, whereby they attest to being better prepared for other classes and jobs because of the training they received from the class and *SIMNet.* See below:

I'm not too sure if you remember me, but I just wanted to say that I am more than glad that I took your class because it has honestly helped me so much in my Intro to Spreadsheets class!
And

I wanted you to know that because of the tools I learned in this course, especially in Excel, I received a promotion.

Connect

Connect (McGraw Hill, 2021) is a publisher-supplied software used for the introduction of technology concepts. Connect provides a platform for students to read, make mistakes and remediate. The software is a digital version of the course textbook and is accessed online through a laptop or tablet.

Connect works by allowing students to access different topics within their e-text. Once an assignment has been launched, *Connect* shows an estimated time for completing the assignment and the number of questions that is contains, this allows the student to allocate proper time to study. Students read the material within the topic; then, students answer questions. If the student answers incorrectly, *Connect* will remediate the student and then go forward with the next question until they have completed the topic question set.

The instructors encourage the students to move directly to the question instead of reading the entire text. Student come to the class with some technology experience; however, the technology experience varies with each student. Therefore, topic remediation differs for each student. The question section for the text is divided by subject topic for example "Networking and connecting to the Internet". The software is intuitive, and if a student missed a topic question phrased three different ways, the software facilitates learning by remediating the student on that topic only. If the student gets the answer correct three times, the software moves on to the next topic question. All topics are included for all students. The system is using an adaptive technology, which enables students to retain the concepts they know and identify the concepts they do not know.

Connect enables instructors to develop course curriculum from a library of resources prepared by subject matter experts and academic researchers. Instructors can access reports and insights to understand the learning curve of their classes and students. The toolkit allows them to share course content and assignments with their colleagues. The shell provided to all instructors for IS 2241 is developed by a committee which determined the technology terms which must be included per the student learning objectives (SLO) for the course. The common course shell in the LMS enables educators to modify content promoting consistency across all sections and classes. (McGrawHill Education, 2021.) *Connect* was implemented in the summer of 2020 to online students in seven different sections (40-70 students in each sections). The student's reviews were extremely positive. Students found it very easy to use, and the instructors also took special note of exam scores. Exam scores were significantly higher than before using the Connect software. Pre-implementation exam scores averaged 74% while post implementation of scores averaged 84%. This software is now being implemented in the flipped classroom setting. During lectures, students are more engaged and understand how the material is applied into the workplace.

DISCUSSION

The promise of improved outcomes that results from using an andragogical approach is found in the flipped design of this course and its heavy reliance on technology to keep the instructors and students in touch with each other while accomplishing coursework, a system that mimics many modern workplaces. In particular, this system helps students step into real world responsibilities with respect to making appointments, keeping appointments, building competency and comfort with online work systems, penalties for failure to meet time constraints, and asking for help from experts.

We contend that students are capable of so much more than what is minimally acceptable for many college courses. Our students are intelligent adults making the transition from high school to college and mature adults who are returning to higher education to improve career opportunities. Part of the job of higher education is to take students to the next level of learning where they are self-motivated and self-aware. In this course, there is no hand holding. The students are required to function as adults by completing assignments by due date and time, being held responsible for initiating tutoring sessions, scheduling appointments for conference, and scheduling exams. While technology laden, IS 2241 allows instructors more free time to mentor students who struggle with concepts. Instructors use teaching techniques that allow them freedom to move from student to student, when necessary, because routinized functions are addressed through technology.

Historically, on-campus students have not been required to have a personal computer which is compliant with all technology deployed in the learning environment. Computer labs are provided by the University for on-campus students. With the move online in Spring 2020, the computer labs were closed. Students were forced to quickly acquire technology that was compatible with the software they needed to complete the spring semester. Students who did not have a background in technology faced difficulties in making the appropriate choices. Six students dropped the class in Spring 2020. Guidance was provided to students, Fall, 2020, on computer system requirements necessary to successfully complete the course. The pandemic necessitated the inclusion of system requirements in the Syllabus, Fall, 2020, with the caveat that students would be expected to have appropriate systems to complete all required class assignments should the class move online. The course shell (LMS) included instructions on how to download, install and access all the software necessary for the course.

Student procrastination and poor scheduling skills impact the student's ability to successfully complete the assignments and, subsequently, the class. Assignments are opened a minimum of two weeks before the due date. Consequently, instructors do not accept late assignments. Students coming from a high school environment where assignments can be submitted late without penalty, or even with a penalty, requires a quick adjustment for everyone. The concept of being responsible for a deliverable by an enforced due date is an andragogical best practice.

Class size limits the engagement from students. Some students will not speak or answer questions, because they are intimidated by the large class size. This is addressed by the mentoring relationship between instructor and student. We often give credit to students not for having the accepted "correct answer" without explanation but, instead, award credit for being able to give a cogent response.

PODding decreased student network ability. One of the benefits of a college education is the network of classmates and the formation of lifelong connections. The adage of "it is not what you know but who you know" is very true, at least in the acquisition of a first job. Years 2020 and 2021 are lost years for networking with class peers for the junior and senior college students. Freshmen and sophomores (FS) have a two-year opportunity to make-up for the lost networking chances, but they, too will, be affected. The FS students will need to put more effort into in-person and online professional and social networking.

Any course can duplicate the technology add-ons described in this paper. Some of the technology relied upon is supplied by the University i.e., LMS and Office software provide license. However, Eventbrite and cloud storage (OneDrive or Google Drive) is available free. The course instructors made sure that the free software provided a safe and protected environment to the student by enforcing privacy settings. Students were scrambling to procure the necessary hardware while stores were shutting down and online suppliers were struggling to meet demand. The university technology department supplied downloadable software for students; however, the installation for non- technical students was difficult.

LIMITATIONS

Because there is heavy emphasis on layering additional software into the course as a response to COVID, the possibility of student software fatigue was a real concern. However, we have had good success with the layered approach with students. They are adept with moving quickly between software applications. Initially, we faced push back from students, for the first two weeks, but have not faced resistance since.

Many instructors faced the pandemic ill trained for the technological hurdles. Instructors faced not only learning to teach online but learning new technology themselves, all within a two-day time frame. Faculty frustration and fatigue during simultaneous implementation of multiple pieces of software in the online environment was common. Anecdotally, instructors are reporting technology fatigue, because there is an extensive learning curve for instructors.

We acknowledge that incorporating andragogical learning is difficult, because each student comes to class from a different background, age, and work experience. The andragogical approach requires more time and effort to have on hand examples from a wider range of possibilities to facilitate interest by the students.

Lessons Learned from the Teaching Team

- How business is conducted has changed and will not go back to exactly how it was prior to the COVID 19 pandemic.
- Teaching will not go back to the way it was prior to COVID-19. More technology will be incorporated into classrooms both on campus and online.
- Students need to know what technology to purchase to be compliant with the technology being used in the classroom.
- Universities cannot assume students have a sufficient technology background; instead, universities must provide written instructions on what to purchase, what is provided by the institution, and how-to set-up the necessary tools.
- With the changes in the learning environment and job environment, adding remote communication tools to an IS course will make the students more job ready.
- Student buy-in to the technology is important. Begin building buy-in from the outset by explaining why they need each piece of soft- or hardware.
- Students who are held to a higher standard deliver a product comparable to the standard and makes them more job ready.
- The younger generation is adaptable to moving from platform to platform. However, they are not fluent with workflow products.
- The process of becoming an adult is difficult. The process of moving from a pedagogical to andragogical method of learning is also difficult. These authors maintain that the process is worth the effort to acquire the life skills necessary for success in life.

CONCLUSION

Pandemics along with rapid technology implementation in the classroom demonstrate why students must be prepared to excel in a technological environment, regardless of career field. Learning and adapting to new technology allows students to bring well developed skill sets and confidence to industry and enables their employers to compete locally and globally. With the added access provided through mobile computing, students enjoy enhanced student access to remote education, so they can remain in touch with a rapidly evolving environment.

Students have been forced online, whether they want to be there or not. Jobs have been forced online, whether they want to be there or not. Ubiquitous technology has changed the way an education is obtained, has changed the way we buy and sell goods/services, has changed communication patterns, and has changed the way we maintain personal relationships. 2020 was the year our students jumpstarted their work lives into the realities of technology as a way of life. Technology has changed the way we live and do business, placing amplified emphasis on technology being integrated into the everyone's life; therefore, technology competency must be viewed as a life skill.

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QUARTERLY REVIEW OF BUSINESS DISCIPLINES

August 2021

Volume 8
Number 2

A JOURNAL OF INTERNATIONAL ACADEMY OF BUSINESS DISCIPLINES
SPONSORED BY UNIVERSITY OF NORTH FLORIDA
ISSN 2334-0169 (print)
ISSN 2329-5163 (online)