Innovation, Excellence, and Engagement in Online Graduate Business Education

A Major Qualifying Project submitted to
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Authorship

This report was written collaboratively by the members of this MQP team: Jessica Evans, Lucas Fernandes, Mackenzie Goldschlager, and Eli C. Ruffa. This report is divided into multiple chapters and sections. Members wrote individual sections, and the group revised and edited sections as a team. We also completed this report with the help of our advisor, Professor Strong, who aided in the editing and revision processes throughout the project.

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Abstract

The intention of this Major Qualifying Project was to assess and find room for improvement in the online learning experiences of the BS/MS Business School student, professor, and faculty populations at WPI. Through surveying and interviewing samples of these populations, we were able to find conclusions and recommendations on how to improve online learning and teaching experiences through formats such as asynchronous learning.

Executive Summary

At the time of writing, the current atmosphere around online, asynchronous graduate course offerings at the WPI Business School had room for improvement. With the unexpected impact of the COVID-19 global pandemic, it was more paramount than ever to conduct research to find out where WPI could improve.

Our mission was to explore how to improve the user experience and engagement level of students enrolled in asynchronous online courses offered by WPI's Business School. To achieve this, we developed the following objectives:

1. To determine the most effective and applicable methods for engaging students in online education.
2. To analyze the current state of online business education at WPI through interviews, surveys, and research.
3. To create a set of recommendations for improving the online experience at WPI and solidifying the institute's position amongst competing programs.

We interviewed nine WPI faculty and staff to learn more about the professors' experience while teaching asynchronously. These interviews allowed us to construct a faculty survey on Qualtrics, which garnered thirteen responses from professors in the WPI Business School. The contents of the survey were as follows:

- Questions 1 and 2 are similar to questions that we asked in our interviews. They ask professors what delivery formats they have taught recently and how satisfied they have been with those formats.
- Questions 3-12 are about the course professors teach, what techniques and software they have used, their satisfaction with these methods, how much time they spend preparing for in-person versus online courses, and how much time professors spend on in-session courses weekly.
- Questions 13-15 helped us understand the support professors receive at WPI, and if there are resources WPI does not provide that could be beneficial for professors.
- Finally, question 16 allowed professors to contribute any comments or suggestions they may have had that could benefit our project or expand on their answers to previous questions.

We also interviewed five students taking various courses in the Business School. In these interviews, we asked students about their experiences with various teaching formats, what they believe to be working in their courses, and what they thought was not working. These interviews informed our student survey on Qualtrics, which gathered responses from sixty-six students. Below are the contents of the survey:

- Questions 1 and 2 reflected much of what we discussed in student interviews, asking students if they have taken graduate business courses and how satisfied they were with those courses.

- Questions 3-5 asked students to rate their satisfaction and engagement with their courses and how they compare to undergraduate courses.
- Questions 6-9 addressed the student experience with various tools and messaging options in their online graduate courses and gauged interest in these tools and messaging options.
- Question 10 allowed students to provide any suggestions or comments on improving student engagement in online graduate courses.

In Chapter 4, we discussed the results of our faculty interviews, faculty survey, student interviews, and student survey, followed by an analysis of our findings. It was clear from the results of our professor survey that teaching in an online format is no simple task. The issue of social disconnection was mentioned in both our faculty and student interviews. Additionally, not every lab or project can be adapted to an asynchronous format, forcing professors to adjust their courses to meet learning objectives. Overall, students expressed the desire for more synchronous opportunities for lecture and discussions, as the consensus was that discussion boards do not work as a replacement for real-time conversation. Some students also mentioned that Canvas organization should be standardized further to minimize confusion about locating class materials.

In Chapter 5 we discuss our recommendations for the WPI Business School, based on our findings from our interviews, surveys, and background research. We outline recommendations that are appropriate for the current implementation. These include changes to the course structure and discussion, such as a further standardization of course organization, increased synchronous opportunities in asynchronous courses, and adding questions to course evaluations to address discussion boards. We also recommended that professors consider utilizing tools such as simulations and direct messaging platforms, as long as these methods are applicable to the course and mesh well with the professor's teaching style. We acknowledged that there is a resistance to change or a reluctance to experiment amongst some professors. For this reason, we emphasized the importance of experimentation in improving the student learning experience.

Additionally, we considered recommendations for the future of the WPI Business School. Other online learning experiences, such as those offered on Coursera, Udemy, and Khan Academy, often use gamfied elements to entice students. We believe that looking to gamify part of the graduate business program at WPI could be an interesting pursuit. LMS plugins can allow instructors to build visible learning pathways for the student experience, as well as reward students with badges and a more obvious display of progress than the typical Canvas experience. VR is also suitable for future consideration, as it could be used to adapt labs and projects for the asynchronous experience.

Throughout our research, there was a unifying theme that bridged the gap between professors and students: the desire for more connection through learning. Though education may be taking the virtual path, one thing is clear: both students and professors need to connect in a learning environment to make it a satisfactory experience for both parties. We hope that through our research, even the most asynchronous courses can still offer the human element that makes higher education a unique experience in the modern era.

1. Introduction

The use of online learning has increased in the past decade along with the demand for accessible learning options. Worcester Polytechnic Institute (WPI) was engaged in developing its online graduate program before the COVID-19 outbreak but has since been required to optimize the program for all graduate students. WPI is currently competing with other universities offering graduate-level business programs, in addition to online learning platforms such as Udemy, Coursera, Lynda, Skillshare, and Udacity. The Business School at WPI is moving the bulk of its graduate business education online to accommodate students with other obligations who may not be able to come to campus or learn through synchronous sessions. Despite these constraints, WPI seeks to provide the same degree of educational excellence to these online graduate students as it does to its in-person undergraduate students. The Business School's increasing number of students in the BS/MS program solidifies the need for ensuring a great experience.

The mission of this project was to explore how to improve the user experience and engagement level of students enrolled in asynchronous online courses offered by WPI's Business School. First, we determined the most effective and applicable methods for engaging students in online education. Then, we analyzed the current state of online business education at WPI through interviews, surveys, and research. To conclude, we created a set of recommendations for improving the online experience at WPI and solidifying the institute's position amongst competing programs.

2. General Background

This section provides recent information about engagement in asynchronous online education. As online education grows in popularity, WPI's Business School is forced to compete with emerging players such as Massive Open Online Courses (MOOCs) and online certificate programs. In addition, WPI has been moving all of its online graduate business education to accommodate the lives of busy graduate students. Whether they are working full-time or tending to family obligations, modern graduate students have little to no flexibility to attend physical classes or synchronous online sessions. Nevertheless, graduate students want an excellent experience. This section discusses trends in the online higher education industry, engagement strategies, MOOCs, and the current state of WPI's online graduate business program.

2.1 Effect of the COVID-19 Pandemic on Online Education

Before COVID-19-related economic and social changes, MOOCs were seen as the primary form of online education, and online degrees were generally not as respected as in-person education. Additionally, the concept of telework was not seen as a feasible alternative to in-person work. Changes in the global business and education environments have led to an increase in funding, infrastructure, and credibility of online programs.

According to a Gartner published article, the pandemic has expedited the development of some higher education institutions and has caused others to expand their online programs (Sheehan & Morgan, 2021). By accelerating their online programs, higher education institutions now offer more accessible learning methods, which enable people from various backgrounds to engage with these programs, driving up enrollment.

2.2 Change in the Higher Education Landscape

Change is inevitable in any industry, so industries must adapt and innovate to maintain relevance. However, higher education is in a flux of creative destruction as new technologies and platforms continue to emerge. Since 1965, enrollment in college campuses has increased from 1.95 million to 5.89 million in 2011. After 2011, enrollment rates slowed, resulting in 5.11 million enrollments in 2019. There has also been a decrease in the number of learning institutions in the United States, dropping from 4,726 institutions in 2012 to 4,313 institutions in 2019 (NCES, 2019). These two observations indicate a decrease in the supply and demand of higher education.

Since new online learning platforms have launched, institutions have had to adapt according to their students' needs and desires. Some fear that in-person higher education may become obsolete. However, creative destruction is not a linear, clear-cut process. The invention of the eReader (such as Amazon's Kindle), sparked fears surrounding the future of physical books. eReaders had some effect on the sales of books, but physical sales remained solid. Thus, eReaders and physical books can coexist together, rather than one rendering the other obsolete.

This may also be the case with higher education. Although the presence of asynchronous online education has increased and disrupted some institutions, users are now accustomed to having both options and will want to continue to have those options.

2.3 MOOCs

Higher education is facing competition from recently-emerging education platforms such as MOOCs. The term was coined by Stephen Downes and George Siemens in 2008 (MAUT, 2021). Their goal was to spread educational resources to learners across the globe. Although enrollment in MOOC programs has been increasing, course completion rates have been low. Recent research shows MOOC dropout rates exceed 90% (Alraimi, 2015).

With classes ranging from lessons in coding to improving social skills, MOOCs earn their name due to their vast catalog of courses from credible schools, the top two MOOCs with the most users are Edx and Coursera (Shah, Pickard & Ma 2022). Although there are various players in the industry, the two make up around 54% of the course content (Appendix H).

2.3.1 MOOCs vs. Online Higher Education

Online education has highlighted the inadequacies of some educators. Before, when only in-person courses were widely available, sites such as 'Rate my Professor' could help steer students away from unpopular teachers. Now, with the boom in online learning and the transparency it provides, both good and bad professors are under the proverbial microscope. In addition, online learning makes it easier for institutions to notice a professor performing poorly in the classroom, as there is video and audio proof.

On the flip side, professors offer an organic teaching environment where students can connect to their educators. In an interview with Faculty C, we were told, "professors commonly compare themselves to $40,000 production teams on Coursera and wonder why their content does not look like that. The thing is, students at WPI do not want a Coursera course. They want a down-to-earth professor to reach out to if they have a question or curiosity about a subject. A too-polished lecture may alienate students (Appendix B)."

Finding the right balance between too little and too much effort in a professor's teaching style is key to a great class, whether online or in-person. Online education may have a learning curve for many professors not used to the teaching format; however, the fundamental essence remains the same - it is still a classroom full of students ready to learn what they are willing to teach.

2.4 WPI's Response

WPI's response to online learning was fast-tracked compared to other higher education institutions. Thanks to the Institute's affinity for adopting new technologies, the changeover to complete online learning was only steps away for many. However, not all professors were

thrilled with the online-focused learning environment. For example, Professor A made it clear they disliked the virtual learning experience, as it did not accommodate their material and learning environment well (Appendix B). WPI is an interactive and project-based learning environment; however, online learning poses some new struggles to the program.

In regards to the Master's program, which is often populated by working professionals seeking an asynchronous learning environment at their own pace, a 100% online-based course system could pose a true challenge for courses and material that is best taught synchronously and in a group setting. WPI's Master's program demographic tends to be a high percentage of current Bachelor's students acquiring a dual BS/MS, and therefore the majority of students have already spent, or are currently spending, a great deal of time on or around campus. However, the remainder of students in the Master's program, especially those in the Business School, are often young professionals who are just getting their careers started and only have a little amount of spare time to complete their degrees. This leads us back to our problem statement: 'How can we improve the user experience and engage students in asynchronous online courses so that WPI becomes a highly recommended choice for online graduate business education?'

As a response to the complete shift to asynchronous online instruction, WPI's Business School has focused on creating consistent teaching guidelines and marketing the graduate program. Considering that professors are now limited to course Canvas sites, recorded lectures, discussion boards, and other forms of online communication to reach their students, WPI faculty boards are working to ensure these hubs are as effective as possible.

The Teaching Policy Committee (TPC) outlines best practices for course Canvas pages, syllabi, and standardized language across teaching materials. Staff Member B provided us with TPC materials covering online course development and delivery. The WPI Online Delivery Rubric outlines what professors should include when considering course overviews, technology and tools, design and layout, content and activities, and interaction (Appendix I). An additional document dives into expectations for overall course development and delivery, as well as explains opportunities for guidance about online instruction (Appendix J).

The Academic Technology Center (ATC) also offers additional supportive services for teaching online courses. They help design courses, handle strategic planning, fill in gaps in the understanding of online teaching, provide faculty learning communities where faculty can share ideas and get feedback, describe how to manage workloads, and support faculty in anything assisting effective teaching. The ATC is a wealth of resources not only for online learning but for general teaching assistance for professors at WPI (Appendix B). It is available to all faculty, should they reach out and use their services.

In addition to creating a set of expectations for online graduate instruction, WPI has also altered the MBA program to attract new students. The program now has 36 credits as opposed to the previous 48. WPI also offers a discount on these credits, decreasing the individual cost from $1,600 to $1,200.

2.5 Learning Management Systems

A Learning Management System (LMS) is a software system that serves as an educational hub where educators can house their teaching content. Two well-known LMS are Blackboard and Canvas. However, there are new software systems like Adobe Capture Prime and TalentLMS (eLearning Industry, 2020). Although the formal software systems mentioned above are sought out due to their complexities and customization possibilities, many apps in the market offer similar capabilities. In a study with Singaporean students, educators used Facebook as an LMS. Using Facebook Groups, educators could make content to be delivered to students directly; content including but not limited to: hyperlinks, pictures, videos, and audio files (Wang, 2012). Students received and submitted assignments, shared course resources, attended weekly tutorial sections, and held discussions using Facebook Groups. The study concluded that Facebook Groups could be used as an LMS. However, students criticized the process of uploading files in PPT and PDF formats.

In a later stage of our research, Professor G informed us of the many capabilities of Canvas, WPI's LMS of choice. In the interview, Professor G described 'new analytics,' which reveal how long students interact with documents and videos, and if students skip through lectures (Appendix B). Learning management systems help automate tasks such as remembering quiz dates, delivering polls and surveys regarding class satisfaction/engagement levels, and managing tasks and projects (Muljana, P. S., & Placencia, G., 2018). Another example that explores the benefits of LMS data comes from a presentation from the International Conference Proceeding Series (ICPS) "Penetrating the Fog: Analytics in Learning and Education". The presentation states that educational organizations employ LMS in their operations for "the measurement, collection, analysis, and reporting of data about learners and their contexts, for understanding and optimizing learning and the environment in which it occurs" (Siemens & Long, 2011, p. 32).

2.6 Gamification

Engaging students in an online setting can be difficult, especially with asynchronous courses. In 2008, the term "gamification" was coined (Urías et al. , 2016). "Gamification is the process of transforming or mechanizing a system to be approached in a game-like or playful manner. In other words, it is the use of elements designed for games in non-game scenarios (Alabbasi, 2017)." Regarding traditional education, one can argue that learning has already been gamified. Students gain points (grades) for completing assignments and taking exams, which become badges (final letter grades), and lead to the leveling up (completing an academic year) (Urías et al., 2016). Further gamifying courses can be an important way of increasing engagement by targeting students' motivation. Adding a sense of achievement to online instruction beyond the traditional number and letter grades positively affects students' learning and motivation to improve compared to classmates.

2.7 Simulations

In an online, hybrid, or in-person setting, simulations remain a highly effective teaching tool for students, as they can step in for real-life scenarios. They provide a safe environment for students to exercise their learning without much risk. There are three main ways of running simulations: single asynchronous player, asynchronous multiplayer, and synchronous multiplayer. Each simulation method has its strengths and weaknesses, so educators are highly encouraged to assess which simulation best fits their teaching goals. Organizations like the Harvard Business School are pioneers with their large catalog of offerings, ranging from business to marketing Simulations.

2.8 VR/AR/MX

Virtual Reality (VR) is an immersive tool that brings the user closer to experiences that are otherwise inaccessible, such as kayaking in Antarctica or sightseeing in Machu Picchu (National Geographic, 2021). VR is gaining traction in other markets, allowing geographically distanced people to gather in a virtual environment. Apps like Meetings by Facebook and Zoom have already enabled people to learn in the same room. There have not been widespread VR developments in the education industry, as the technology is currently still expensive and software development has not met its peak.

2.9 Analyzing Data

Data analysis can be defined as a methodological process of obtaining, processing, cleaning, exploration, modeling, and communicating data (Mukhiya, S. K., & Ahmed, U. 2020). This process is imperative to our project, as it provides practical steps to maximize our data findings in a way that is unbiased and utmost truthful. Although the dataset we are working with is small, we can still apply principles from data analytics and data science to help us draw meaningful conclusions in this report.

3. General Methodology

The mission of this project is to explore how to improve the user experience and engagement level of students enrolled in asynchronous online courses offered by WPI's Business School. To achieve this, we developed the following objectives:

1. To determine the most effective and applicable methods for engaging students in online education.
2. To analyze the current state of online business education at WPI through interviews, surveys, and research.
3. To create a set of recommendations for improving the online experience at WPI and solidifying the institute's position amongst competing programs.

We developed these objectives to explore asynchronous online education from both the student and professor's perspectives. In this chapter, we outline our methods for conducting faculty interviews, a faculty survey, student interviews, and a student survey. In Chapter 4, we discuss the results of these interviews and surveys and analyze our findings. In Chapter 5, we discuss our recommendations for current and future implementation, based on the results of our interviews, surveys, and background research.

3.1 Conducting Professor and Staff Member Interviews

The purpose of our professor and staff member interviews was to give us an idea of the specific resources professors have access to, how they measure student engagement, what they have been struggling with when teaching online, and what techniques have worked well for them. We conducted six interviews with professors in the Business School and five interviews with WPI staff (we interviewed Staff Member C twice). We held these interviews over Zoom in a structured manner, where we asked professors questions regarding their experience teaching undergraduate and graduate courses (Appendix A). For interviews with WPI staff members, we asked questions that pertained to their role in assisting professors with structuring their courses.

3.2 Conducting the Professor Survey

In order to gather all necessary and valuable information, we created a Qualtrics survey to send to professors. The survey was also sent to professors we previously interviewed, as the survey includes quantitative questions that were not asked in those sessions (Appendix C). Below is an overview of the questions in our professor survey:

- Questions 1 and 2 are similar to the questions that we asked in our interviews. They ask professors what delivery formats they have taught in recently and how satisfied they have been with those formats.

- Questions 3-12 are about the courses professors teach, what techniques and software they have used, their satisfaction with these methods, how much time they spend preparing for in-person courses versus online courses, and how much time professors spend on in-session courses weekly.
- Questions 13-15 helped us to understand the support professors receive at WPI, and if there are resources WPI does not provide that could be beneficial for professors.
- Question 16 allowed professors to contribute any comments or suggestions they may have had that could benefit our project or expand on their answers to previous questions.

3.3 Conducting Student Interviews

To inform the questions included in our student survey, we conducted several informal interviews with WPI students. These students either have taken or are currently taking graduate classes at WPI's business school. In these interviews, we discussed the student experience in these graduate classes, how it compared to previous courses, and what students liked and did not like. The goal of these interviews was to better understand the student experience in these graduate courses so that we could tailor our survey questions accordingly.

3.4 Conducting the Student Survey

To gather quantitative data on students' experiences taking WPI's graduate business courses, we created a Qualtrics survey informed by the results of our student interviews. With the help of Staff Member B, we sent the survey to members of the WPI Business School. The survey questions gathered information from students who have taken graduate business courses, focusing on their engagement and satisfaction in their course experiences. The survey also asks about the students' experience with various tools and software and what they might want to use in future courses. We asked if students use or would like to use direct messaging, such as Slack, MS Teams, or Discord, to communicate with professors and/or classmates.

To ensure the integrity of our target audience, the first question of the survey, "Have you or are you taking business graduate courses at WPI?" aims to filter "no" responses as that would generate invalid data. In addition, a Qualtrics script was used to redirect negative responses by sending them to an exit landing page where they are thanked for their time. The survey questions were as follows:

- Questions 1 and 2 reflected much of what we discussed in student interviews, asking students if they have taken graduate business courses and how satisfied they were with those courses.
- Questions 3-5 asked students to rate their satisfaction and engagement with their courses, as well as how they compare to undergraduate courses.

- Questions 6-9 addressed the student experience with various tools and messaging options in their online graduate courses, as well as gauged interest in these tools and messaging options.
- Question 10 allowed students to provide any suggestions or comments on how they would improve student engagement in online graduate courses.

4. Results & Analysis

In this chapter, we discuss the faculty and student interviews, our professor and student survey findings, and an analysis of our results. To conclude this chapter, we summarize the key findings from engaging with WPI faculty and students.

4.1 Professor and Staff Member Interview Results

Empirical results from the individual professor and staff member interviews allowed us to explore the experience of an online graduate education course from a professor perspective. Asking questions specific to each professor and staff member allowed us to develop questions for the professor Qualtrics survey.

4.1.1 Support and Concerns with Creating Online Course Content

An interview with Staff Member C discussed the optional course offered for professors on how to create an online course (Appendix B):

"A lot of it was going back to basics, most faculty don't have training in how to be a teacher, so they emulate what they had in the classroom. … We teach them the basic design process, how to think of outcomes before the course starts (backward teaching), such as 'what does the outcome for students look like at the end?'... We teach the need for more structure and different ways to communicate that are lost in online classes. Such barriers include: not being able to see students' body language and facial expressions, being asked questions after class, comes back to basics as good teaching. Essentially, we offer a course on how to be a better teacher, not necessarily just teaching online."

Staff Member C goes on to further discuss the pressure professors may feel to produce 'perfect' content in comparison to MOOCs, which often have larger budgets and production crews that WPI staff members lack. In these instances, they recommend instead playing to their strengths and embracing their imperfections.

"...Recording themselves ahead of time is hard to see themselves say 'um.' (They) make mistakes in a class all the time, but it is not something they have to keep rewatching. High production value things are not necessary for what they're doing, students don't care about production value."

Professor A, echoed these same anxieties:

"It took me two weeks to create one 5-minute video. (I feel it) needs to be professional quality content, since (MOOCs have made) the standard so high now. I've divided my lectures

into micro-lectures of 5-10 minutes. (I don't feel students) can be engaged for any longer; content shouldn't just educate, but also entertain."

According to the staff at the ATC, embracing being approachable and down-to-earth as a professor, as opposed to coming across 'perfectly' as a high-production MOOC, would add value to the course, not detract from it. Graduate students already know going into their programs that professors are not using film crews or special production environments. Rather, the value is in having a professor who brings a wealth of experience and industry knowledge and making it uniquely deliverable to students in a way only they can, as well as having the opportunity to establish a true interpersonal relationship between professor and student. This alone hints that no matter how prevalent MOOCs may be, institutional higher education will always have a valuable place in the industry and society.

4.1.2 Accessible Online Course Content

Professor A made notable points about certain aspects of creating quality content, specifically relating to accessibility (Appendix B):

"Accessibility is important (to me). I also make sure that all of my lectures have subtitles to be completely accessible for all students. Additionally, I ensure appropriate colors for a colorblind audience."

This sentiment was echoed by Staff Member C, who also make accessibility their priority (Appendix B):

"(Courses should have) universal design; you shouldn't need accommodations since everything should be accessible for (all) students. ...closed captioning in a classroom is a big one and works for (almost) everyone. Personal preference, of course, plays a part (professors' desire) In having autonomy or having control over the learning environment. Having that safety makes students feel engaged, plus one method: create a video with annotated slides or captioning. Post the transcript in case people don't want to (or can't) watch videos, open the script to find sections to revisit. Giving options is important. Are there other ways for students to show knowledge, aside from exams, if students are poor test-takers but know the material?"

While it may take more time in the short term to create an accessible online course, it is a crucial step to improving not only the quality of the course content, but the engagement, wellbeing, and overall long-term success of students in the classroom and beyond.

4.1.3 Rebranding, Marketing, and the Target Audience of the WPI Business School

Currently, WPI undergraduate students are the target audience for promoting the BS/MS program. The COVID-19 pandemic spurred the WPI Business school to hasten their push towards online learning, as Staff Member A delved into deeper (Appendix B):

"(We shifted the credits earned requirement from) 48 to 36 credits, discounted tuition so credits are (down from) $1600 and now $1200. (We are) standardizing best practices while not being rigid to (potentially) eliminate professors… (we are) looking to faculty canvas sites to make sure specifically we are building an online community. It's very important to build a community as online learning becomes predominant."

The push to incentivize current BS students at WPI to take courses with the graduate Business school has already had some payoff, according to Staff Member B interviewed at the WPI Business school:

"Though COVID slammed the breaks on international pipelines, (which) made up most of the graduate students, there are a growing number of students in both the MBA and MS programs. Some students are not officially BS/MS until after the application process but are registered for MS classes. (At the time of this interview, there are) about 400 total students in the graduate business program, across both MBA and MS programs. …Due to the lockdowns during the COVID-19 pandemic, students are not struggling to find jobs, and employers would push back start dates. The better use of time (would be too) to spend time in graduate school; in addition, WPI undergrads are seeing the logic in getting the most out of their money, and can usually fit it into a 4-year window."

Many current students took the opportunity to restart or begin their higher education journeys during the COVID-19 pandemic, and it seems that WPI students are no exception to this phenomenon. With the ability to take a break from the immediate need to find a job, WPI students took time to continue their education in the WPI Business School and pursue an MBA or MS program.

4.1.4 Overall Professor Response

Through all of the interviews conducted one-on-one with the team and WPI Business School professors, there seemed to be a theme of discussing what has been lost in the transition to online learning. Professor A went in-depth:

"It's not possible to make every lab, every project asynchronous… (some require) students… to practice problem-solving in real-time. Some things, like discussion boards, went well; others, like Zoom lectures, the classroom experience isn't the same (as in-person). Looking forward to the future, it would be cool to use VR for things like case analysis… but I think (WPI should do their best) to duplicate the best learning experiences that students have in a live classroom environment (Appendix B)."

Other professors also expressed how much they missed in-person teaching elements. However, some professors, like Professor B, seemed to excel and even flourish in an online teaching environment once they made use of the support available to them:

"I promote collaboration and communication, and the students enjoy it. It's going well. I simulate in-person engagement in the context of online education and get students involved in ongoing discussions. …Only challenge I had was grading students' submissions, (and to help with that) this year I had TA's who helped with grading. To post videos, I contacted ATC, they told me about using cloud space to post videos on Canvas. In addition, they have an online teaching training program for faculty members in the summer of 2020. The ATC has provided anything we wanted; I haven't needed much more than that (Appendix B)."

Professor C agreed with Professor B and continued to elaborate further that the key seems to be engaging students and, as a professor, remaining as accessible as possible:

"Participation through talking in class or posting in discussion boards has kept engagement levels similar (to those of an in-person classroom environment). Participation and contribution from students for the entire class are the most important learning outcomes in my course. Because of being online, discussion boards such as Slack created an easier way to engage students… Students were overly engaged, more than what I expected. Slack allowed me to answer student questions in real-time, create channels for different topics to keep the discussion organized, and overall stay connected with my class (Appendix B)."

4.2 Professor Survey Results

The results of our faculty Qualtrics survey (Appendix C) allowed us to pinpoint the likes and dislikes of professors and their current daily usage of available online education tools. The results below are shown through tables and graphs.

Question 1 asked what delivery format professors have used to teach courses in the past two years (Figure 1). 92% of respondents reported that they have taught in-person and/or synchronously online in the past two years. Fewer professors have taught with a hybrid format

(85%) or asynchronously online (77%). However, more than half of surveyed professors have taught with each delivery format.
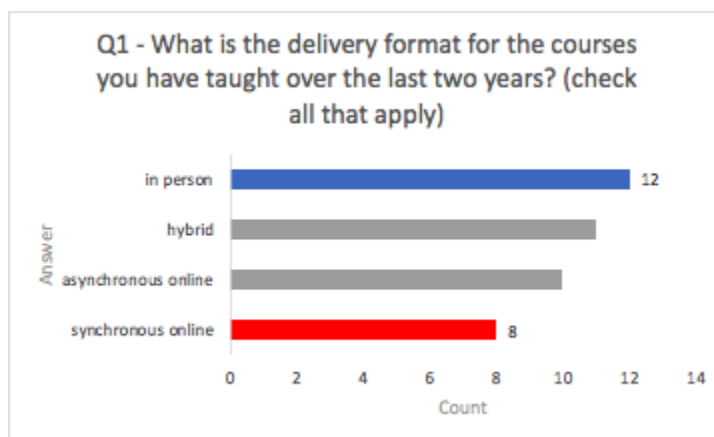
Figure 1: Professor Survey Question 1

Question 2 (Figure 2) asks professors about their satisfaction level with teaching in delivery formats mentioned in Questions 1. 38% of the surveyed professors were extremely satisfied with their experience, 54% were somewhat satisfied, and 8% were somewhat dissatisfied.
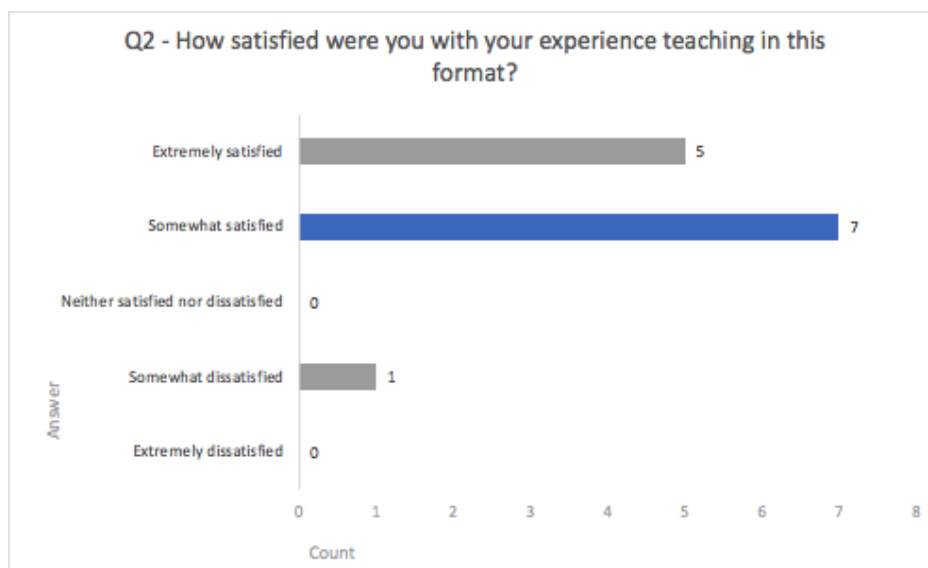
Figure 2: Professor Survey Question 2

Question 3 (Figure 3) asks professors how satisfied they were with student engagement in their courses. Three (23%) of the professors were extremely satisfied with student

engagement, eight (62%) were somewhat satisfied, one (8%) were neither satisfied nor dissatisfied, and one (8%) were somewhat dissatisfied. 85% of the surveyed professors answered that they were somewhat satisfied or extremely satisfied.
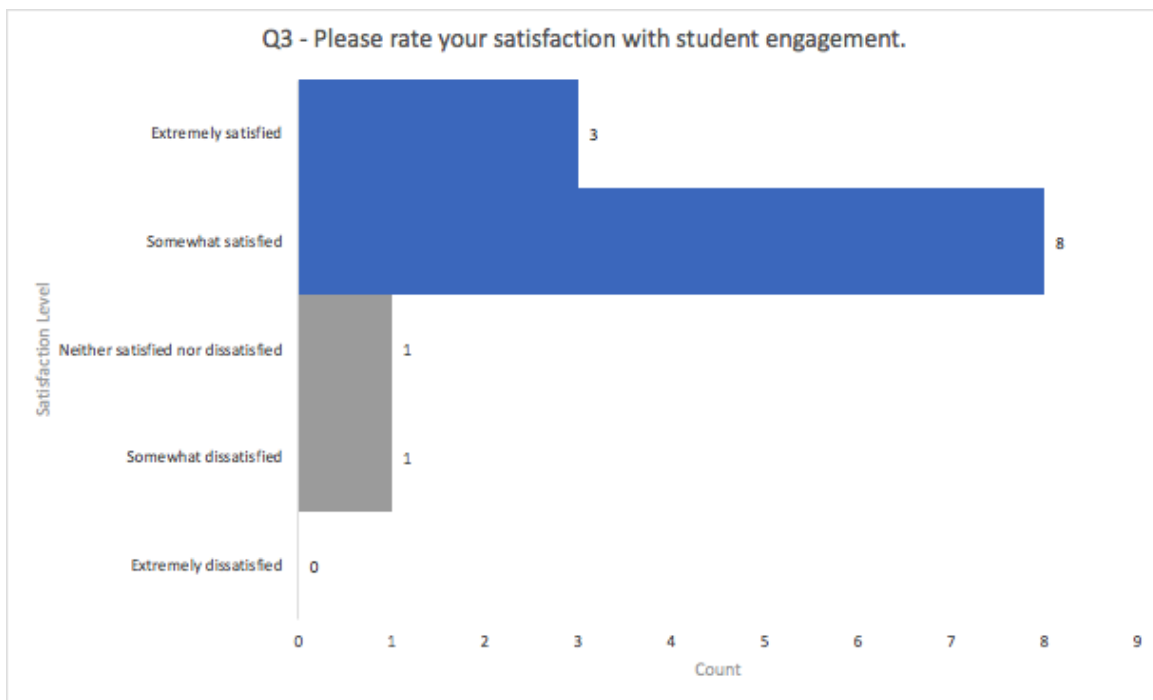
Figure 3: Professor Survey Question 3

The results of Question 4 (Figure 4) are represented with a stacked bar chart, showing the professor's experiences using various tools when teaching online. Professors were most interested in using the following tools/methods for teaching online: email correspondence with students (13 responses), convenient access to the course material (12 responses), homework assignments and submission (12 responses), video or video conferencing (11 responses), and learning modules (11 responses). The most unused tool amongst surveyed professors was secure online testing with anti-cheating software.
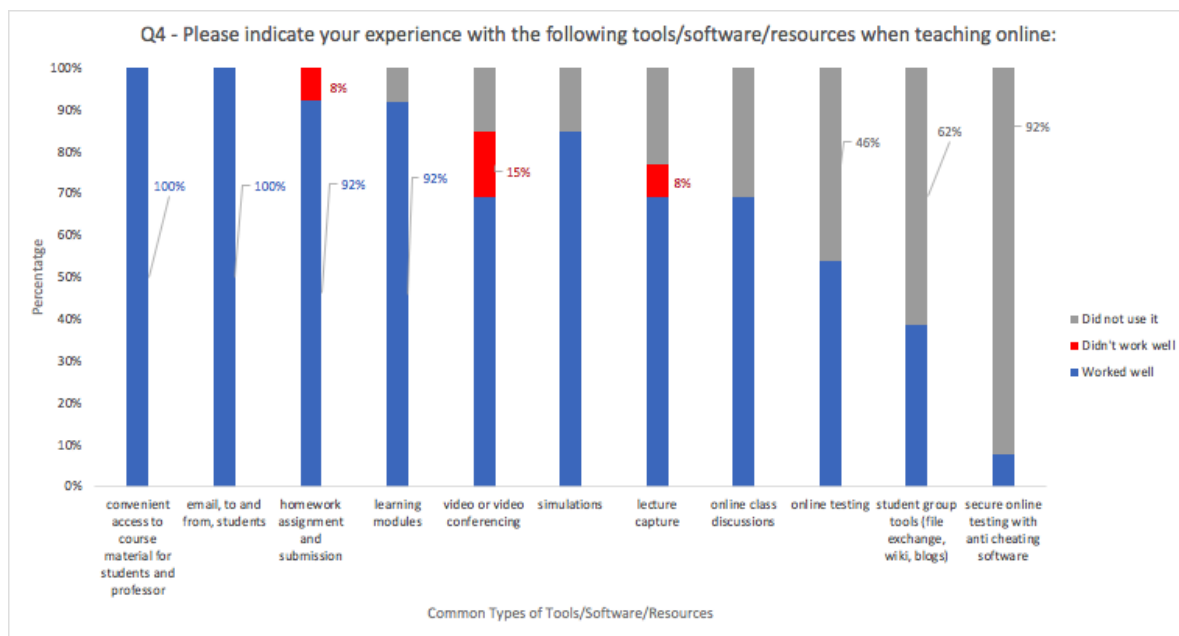
Figure 4: Professor Survey Question 4

Question 5 (Figure 5) asked professors what teaching methods they prefer, it showed the top three percentages (total by selection), since "Worked Well" received the same %, it showed the top 4. Email and video conferencing were the two most popular responses for with 12 and 11 responses, respectively. Student group tools and anti-cheating software were the least popular methods, with 7 and 4 responses, respectively.
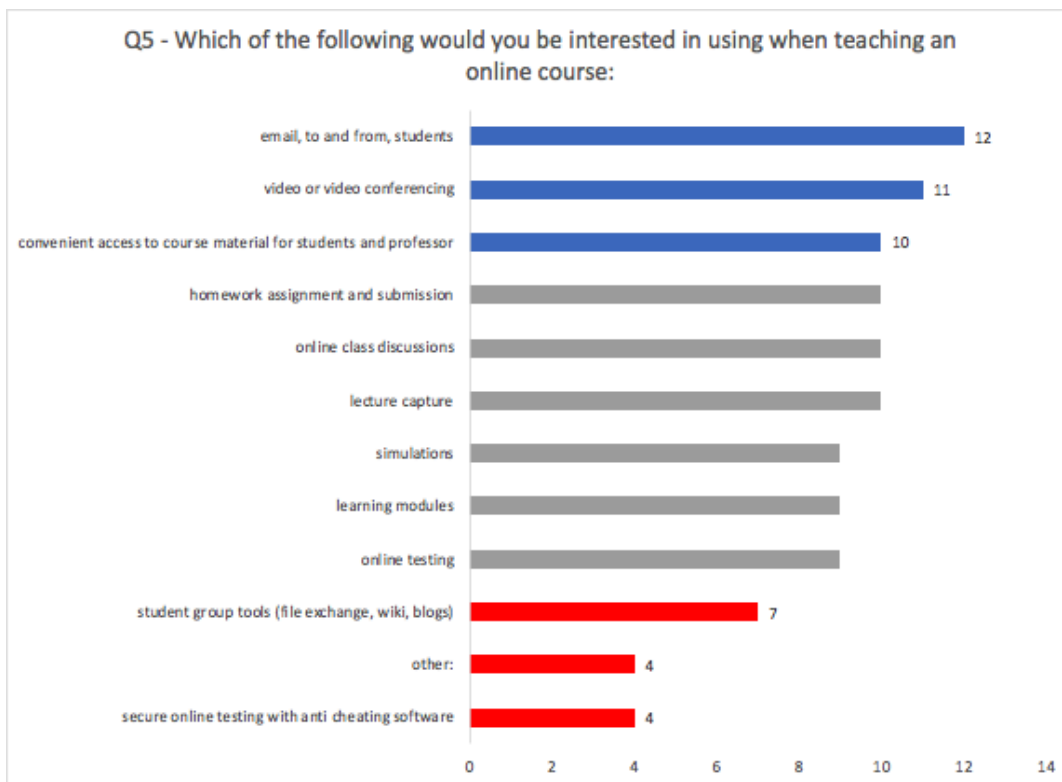
Figure 5: Professor Survey Question 5

Question 6 (Figure 6) asked professors if they currently use Slack or other direct messaging applications to interact with students in their courses. Only 15% of professors reported that they use direct messaging in their courses. In addition, 77% of the professors reported they do not use direct messaging in their courses. The remaining 8% reported they have used other messaging apps such as Microsoft Teams and Zoom.
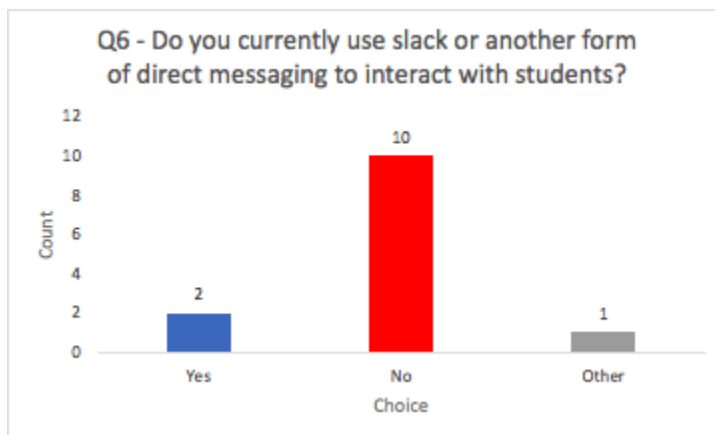
Figure 6: Professor Survey Question 6

Question 7 (Figure 7) asked if the professors would be interested in using Slack or another form of direct messaging. Out of the professors not already using Slack, 4 or 36% of them reported that they would like to try Slack or another direct messaging platform to interact with students. However, a greater percentage of professors - 7 or 64% - responded they would not desire to use messaging apps.
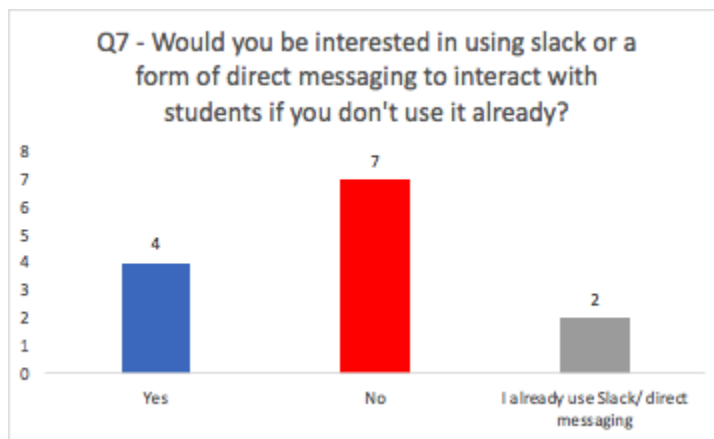
Figure 7: Professor Survey Question 7

Question 8 (Figure 8) asked professors how many hours they spend preparing material for an in-person course before the course begins. Out of 13 professors, more than half of them spend up to sixteen hours preparing for an in-person course, with 23% of professors answering that they spend more than forty hours preparing for an in-person course.
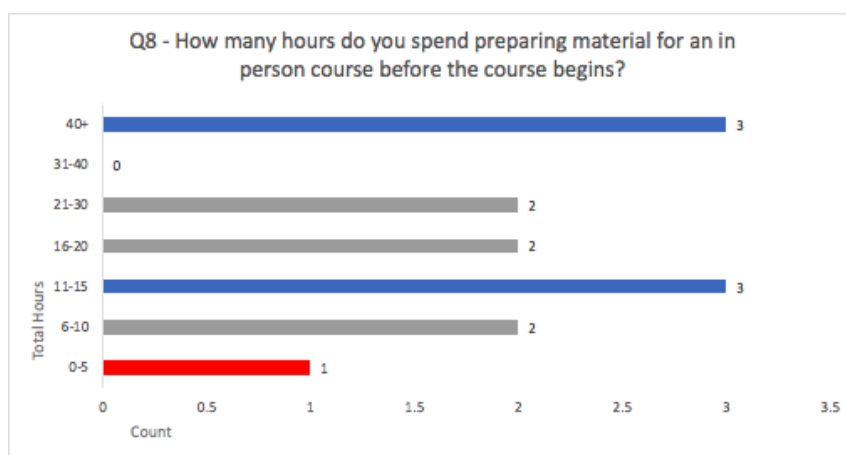
Figure 8: Professor Survey Question 8

Question 9 (Figure 9) asked professors how many hours they spend on a course per week, while actively teaching in person. Question 11 asked professors how many hours they spend on a course per week, while actively teaching online. The responses to these questions were similar, with professors reporting a similar number of hours spent actively teaching online and in-person courses.
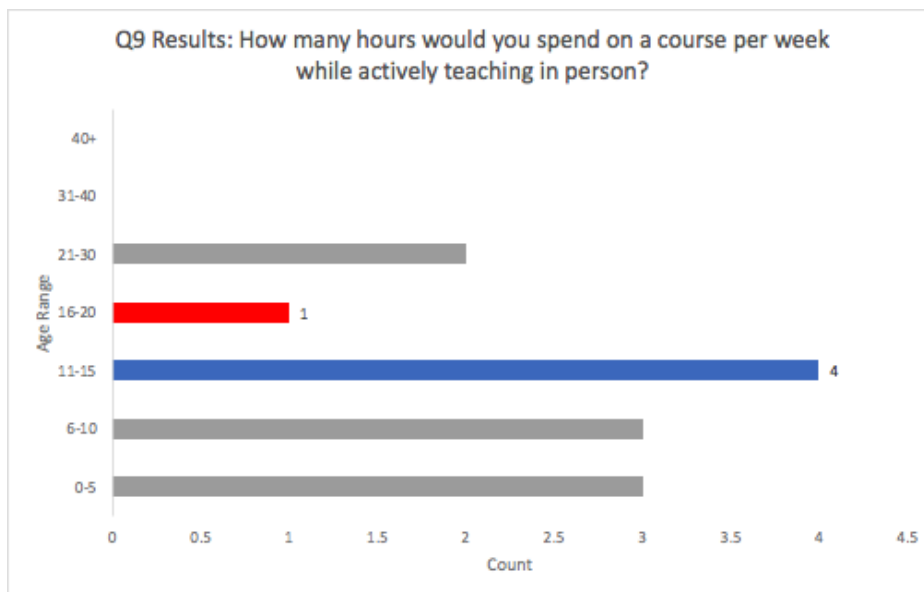
Figure 9: Professor Survey Question 9

In Question 10 (Figure 10) , when professors were asked how much time was spent preparing the material for a course, both online and in-person, answers varied. The columns analyzed the change in the time it took between preparing for an in-person versus an online course. Out of the 13 respondents, 7 had different times of preparation between online and in-person, and out of the 7 respondents, 6 of them reported that online courses take more time than in-person courses.
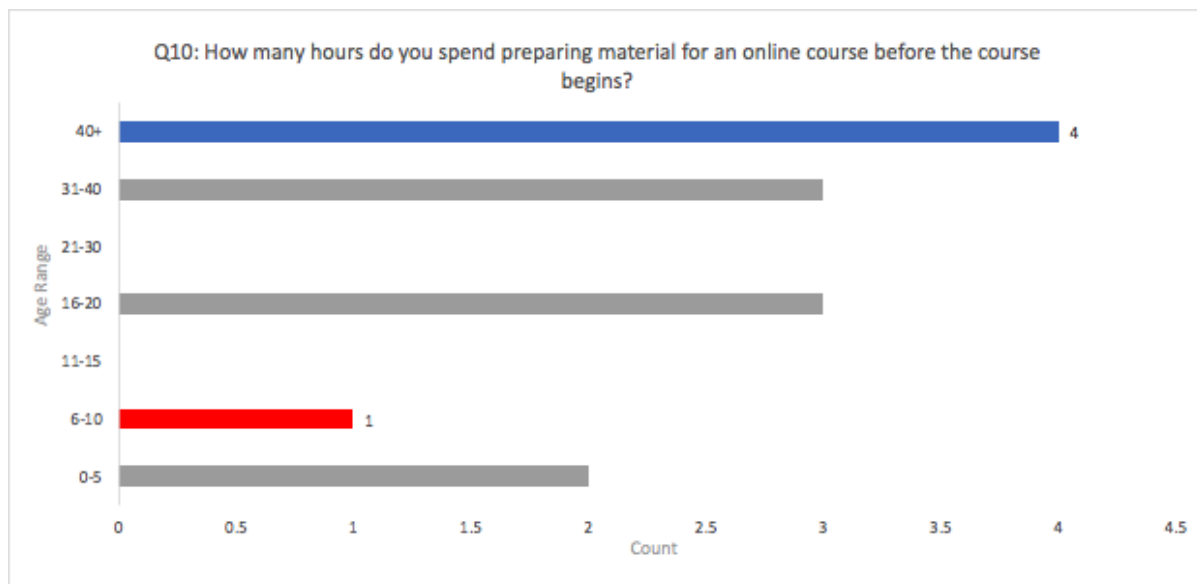
Figure 10: Professor Survey Question 10

Question 11 (Figure 11) asks professors how many hours they spent on the course during a typical week while actively teaching online. Out of 13 respondents, 7 or 54% of professors spent over 30 hours on the online courses. This showcases the significant change relative to teaching in person.
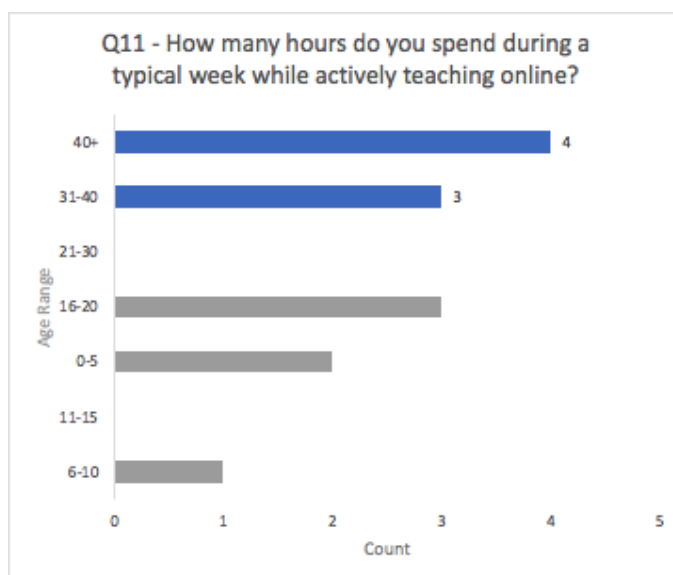
Figure 11: Professor Survey Question 11

Question 12 (Figure 12) , asks how satisfied with the support WPI gave when preparing for online teaching, which generated a positive response of 85% of professors reporting they were either 'Extremely Satisfied' or 'Somewhat Satisfied' with the assistance the school provided.
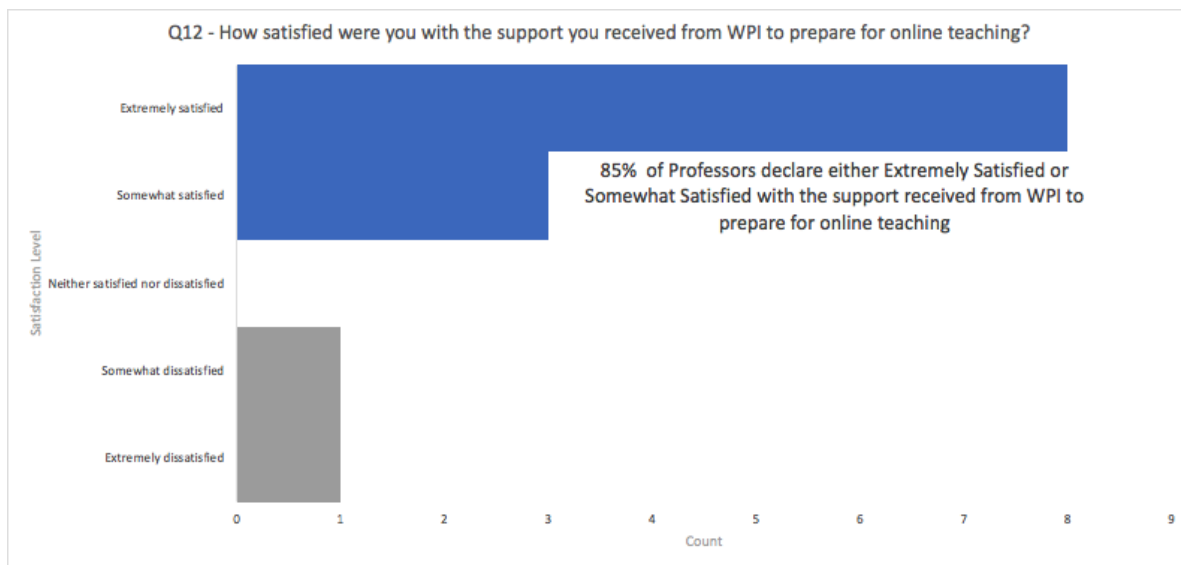
Figure 12: Professor Survey Question 12

Question 13 (Figure 13) , a two-part question, first indicates that there is a large proportion of respondents who have experience utilizing help from WPI when preparing for online courses. The second part of the question asks to specify what type of help, showed a trend of IT regarding Canvas. After analyzing the trends of the respondents who answered the second part "If yes, so what?" A trend was found of Professors having encountered issues when dealing with video capture, canvas bugs, classroom system, and PC problems.
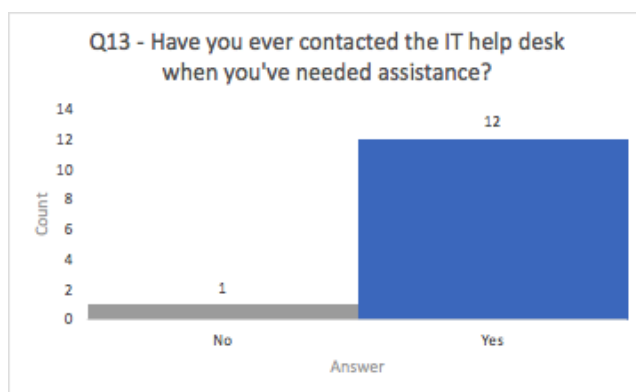
Figure 13: Professor Survey Question 13

Question 14 explores what kind of help professors have reported having received and what they would like to see provided in the future. According to the Professors' responses, they

would like to receive more help when it comes to learning management systems, such as help with lecture capture, help to upload grades between Canvas and Workday, and to have Canvas integrate smoothly with video capture, microphones, editing, posting, tracking, attendance. From the types of support voiced by the professors, it seems that they are not fully reaping the benefits of what learning management systems have to offer - such as efficiency and accountability. One response states, that "Updated packet at the start of each academic year describing tools that can be used in courses (and what might have changed); e.g., linking to one drive files directly in Canvas," which speaks to the lack of a centralized methodology of interacting with the said system (Appendix G).

Question 15 made room for Professors to voice suggestions or concerns regarding the survey and what has been asked from them, which was to discuss their various experiences regarding teaching online and teaching in person. The most memorable responses were:

"If we are going to be serious about Hybrid teaching, we need to have the tech that supports that more with the analytics all plugged into the LMS (Canvas). We need better integration with the room resources, microphones, canvas, zoom, our laptops, video editing software, and grading attendance. Too much is manual currently for integration.."

"Course prep for the FIRST time I teach an async course is brutal (recording, editing, re-recording if I made mistakes, etc; getting all the weekly modules and instructions just right), but afterward that I change less than 15% of the content for a couple of years (there are always small tweaks from semester to semester...my courses are never 'static'), so I can focus less on my content and structure after the first iteration of a course and more on student interactions. Instant messaging and slack are barking up the wrong tree I think; async is async, and email within 24 hours works just fine. I dislike that Canvas email and Outlook aren't integrated, and Canvas email is not 'full feature' in the same way Outlook is. It's a hassle to select email addresses, I don't think there's a great search feature, etc. I feel like teaching in our hybrid MBA program before the pandemic prepared me well to do a great job with fully async, and I feel like I'm good at async, and my students think so too, so resource-wise, I am all set but I can understand how other faculty may need help. The ONLY thing I dislike about asynchronous or even sync over Zoom is getting to know the students a little better because there are not all the tiny, fast interactions that happen before and after class...I just do not feel AS connected with my async students as I do F2F students, and that's the biggest downside for me."

"Teaching online is very similar to teaching in the classroom, except the loss of interpersonal facial expressions and body language is a loss. Humans like time together in the same room. I use a Discussion Board in all my classes. I use Canvas in all my classes. I try to support students in all my classes."

Most of these responses included interactions with the LMS, and how it could be operated differently to solve their current obstacles, such as integrating email and "room

resources, microphones, canvas, zoom, our laptops, video editing software, and grading attendance." Many answers also expressed the loss of "interpersonal facial expressions and body language" and "all the tiny, fast interactions that happen before and after class."

4.3 Professor Survey Analysis

The Professor Survey showed key trends when Professors were asked about their teaching formats. Specifically, the additional time it takes to prepare for an online course compared to in-person, popular tools professors show interest in using for online courses, and the satisfaction faculty showed with the support provided by WPI, and the lack of professors using direct messaging apps. We were able to create a cohesive understanding of some challenges and opportunities of growth accrued from the professor survey, which will provide critical recommendations for the WPI business school.

4.4 Student Interview Results and Analysis

Our team interviewed five students taking graduate business courses at WPI's Business School. These students had different course content, course scheduling, and course engagement. All of the students are part of the BS/MS program at WPI. Some had taken only one graduate class, while others were taking their final few classes to complete their degree. The students were also working towards different Master's degrees in Management, Data Science, and User Experience. We conducted these interviews informally over Zoom, but guided them with questions found in Appendix D.

A few themes emerged after conducting all five interviews. It was clear that students respond well to optional meeting times in fully asynchronous courses. The students acknowledged that it allows them to see their professors as more personable as opposed to inaccessible or just a profile picture on Canvas discussion boards. We also found that students appear to be more engaged when there are various types of assignments. For example, students find themselves more engaged when professors utilize group assignments, simulations, individual homework, and discussion boards, as opposed to when only one or two different types of assignments are used. Finally, when asked about lecture capture techniques, the students shared that they prefer the videos of their professors talking through the PowerPoint instead of narrated slides. From gathering these student perspectives, we generated survey questions that best gauge student engagement (Appendix F).

4.5 Student Survey Results

To ensure the integrity of our target audience, graduate students who are taking or have taken graduate courses at WPI, the survey began with Figure 1, "Have you, or are you taking business graduate courses at WPI?" which shows three invalid responses. To refrain those three

from continuing the survey, a Qualtrics script was used to send them to an exit landing page where they were thanked for their time.
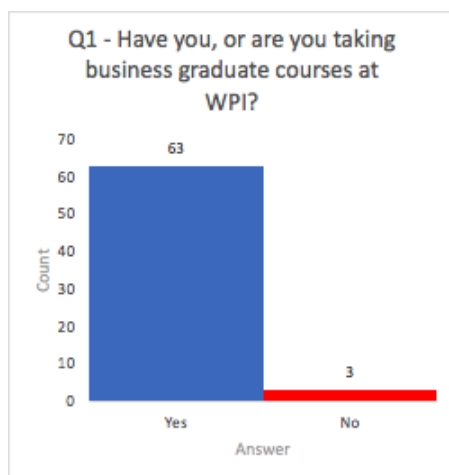
Figure 14: Student Survey Question 1

Question 2 (Figure 15) asked students to describe their satisfaction with different graduate course formats; Fully Online Synchronous, Fully Online Asynchronous, Hybrid, and In-Person. To visualize the responses "Extremely Engaged" and "Somewhat Engaged," we aggregated the responses showing the following results: Fully Online Synchronous (21), Fully Online Asynchronous (24), Hybrid (13), and In-Person (20).
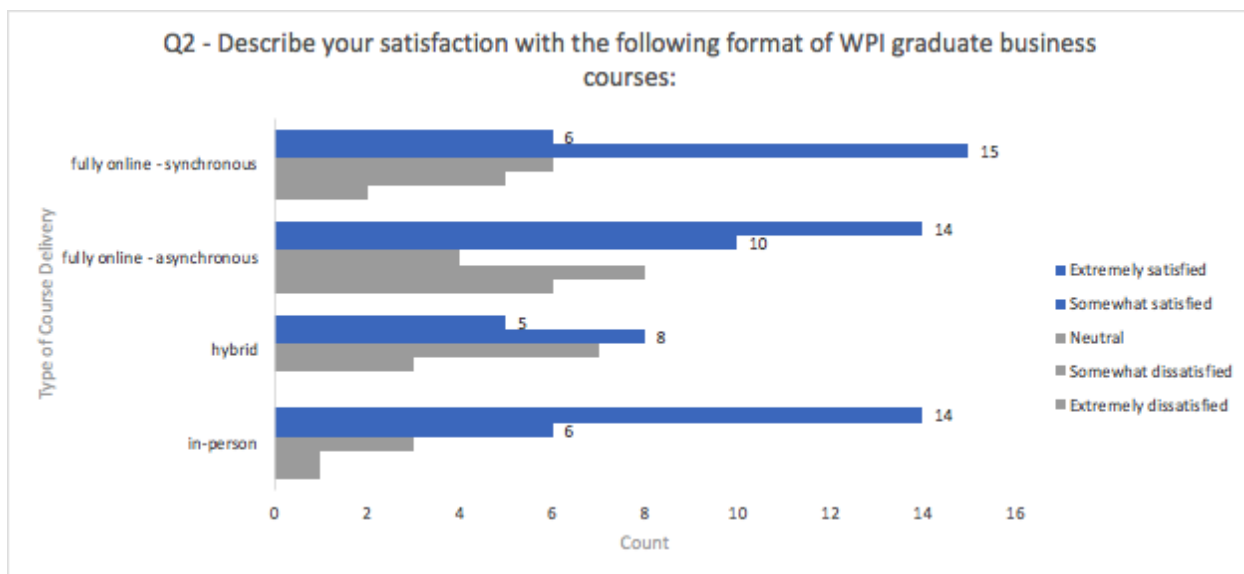
Figure 15: Student Survey Question 2

Question 3 (Figure 16) asked students to describe their engagement with different graduate course formats; Fully Online Synchronous, Fully Online Asynchronous, Hybrid, and In-Person. To visualize the responses "Extremely Engaged" and "Somewhat Engaged" we

aggregated the responses showing the following results: Fully Online Synchronous (22), Fully Online Asynchronous (28), Hybrid (18), and In-Person (22).
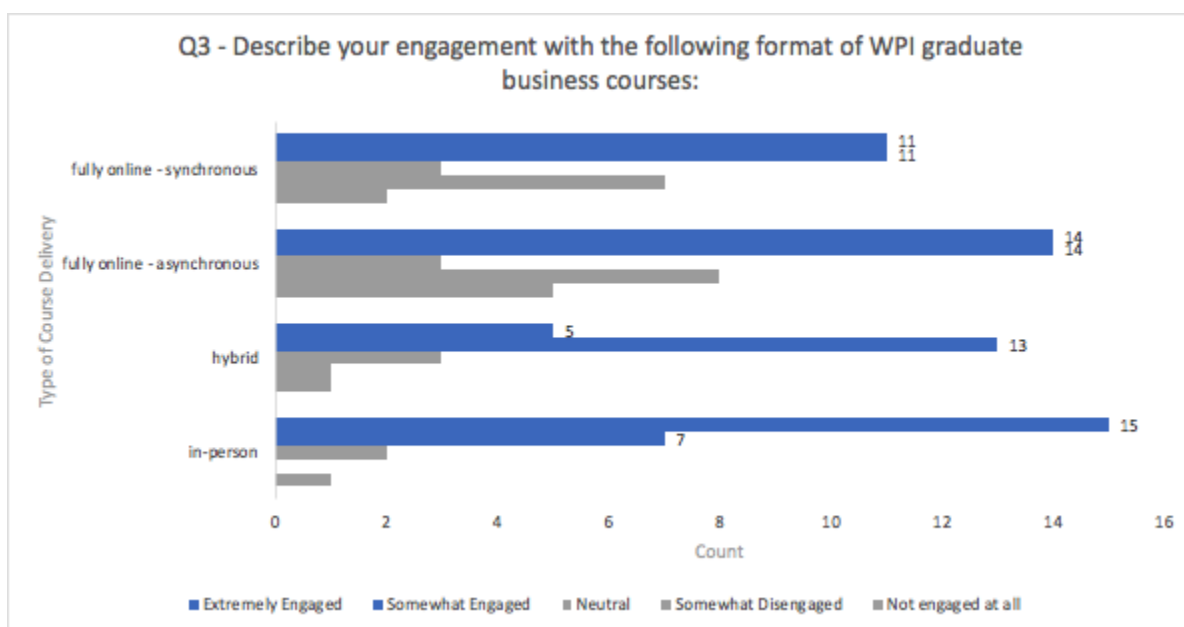
Figure 16: Student Survey Question 3

Question 4 (Figure 17) asked students to reflect on how their engagement in graduate business courses may have differed from their engagement in undergraduate courses. Most respondents taking in-person graduate courses stated their engagement has not changed. Respondents taking hybrid and synchronous online courses fell somewhere in the middle, with most stating their engagement has changed a moderate amount. Students taking asynchronous online courses reported the most significant change in engagement from their undergraduate courses.
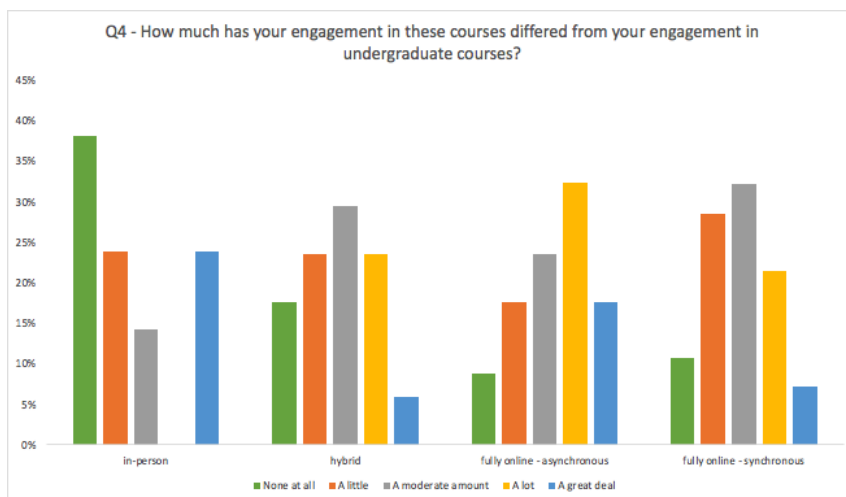
Figure 17: Student Survey Question 4

Question 5 (Figure 18) asked students about the difficulty of their graduate courses compared to their undergraduate courses.   43% of respondents said their graduate courses were somewhat difficult, 35% said they were neither easy nor difficult, and 22% said they were somewhat easy.
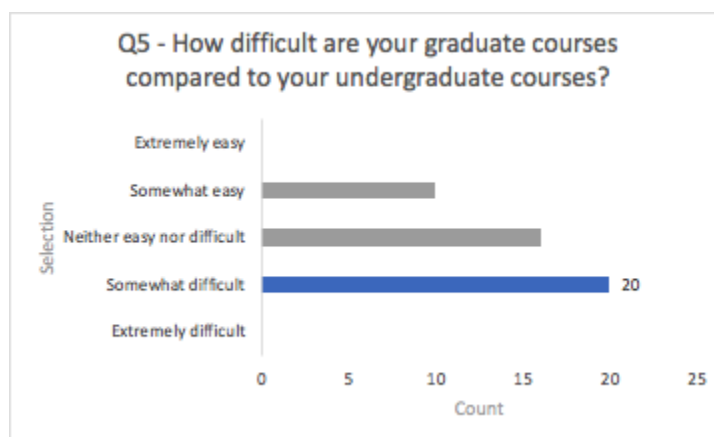
Figure 18: Student Survey Question 5

Question 6 (Figure 19) asked students to rate their experiences with different resources used for online learning. The above graphic shows the top five responses to what: Worked well, did not work well, and did not use. The top five selections for what "Worked Well" were "Homework Assignment and Submission" (46), "Convenient access to course material" (42), "Learning Modules" (41), "Video or Video Conferencing" (40), and "Email to and from

students" (37). The top selections for "Did not work well" were "Online class discussions"(19), "Email to and from students" (7), "Online Testing" (6), "Student Group Tools (file exchange, wiki, blogs)" (6), and "Lecture Capture" (6). It is interesting seeing that Email was both top 5 in "Works Well" and Did not "Work Well". The three that are top five in both Did not Work Well and Did not Use is also interesting. "Did not use" were "Secured Online Testing with Anti Cheating software" (34), "Online Testing" (23), "Lecture Capture" (20), "Student Group Tools (file exchange, wiki, blogs)" (14), and "Learning Modules" (6).
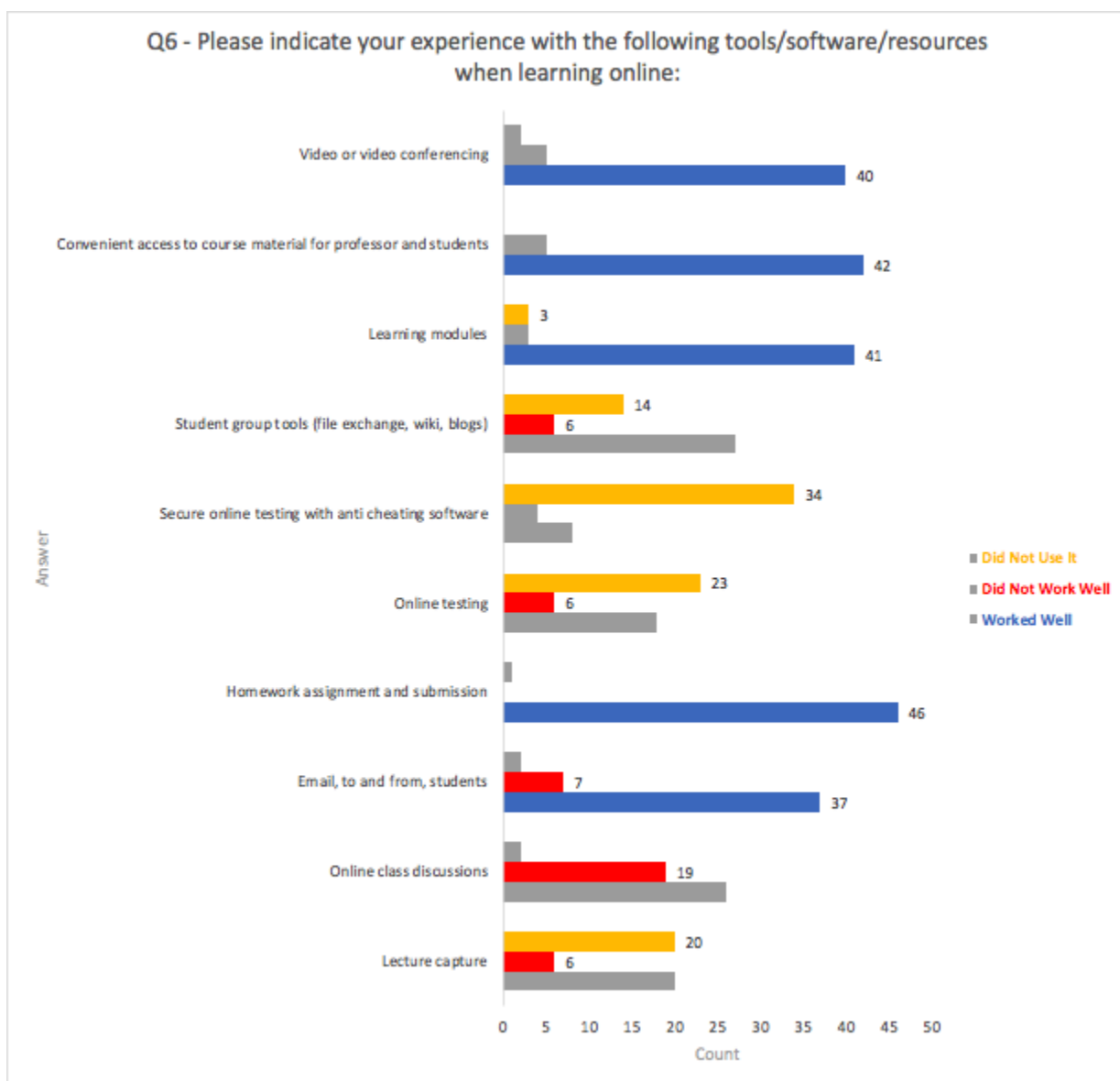
Figure 19: Student Survey Question 6

Question 7 (Figure 20) asked students what tools they would be interested in using in an online course. The most popular answer was "Convenient access to the course material for

professor and students," with 37 responses. The least selected tools were "Secure online testing with anti-cheating software," with 6 responses.
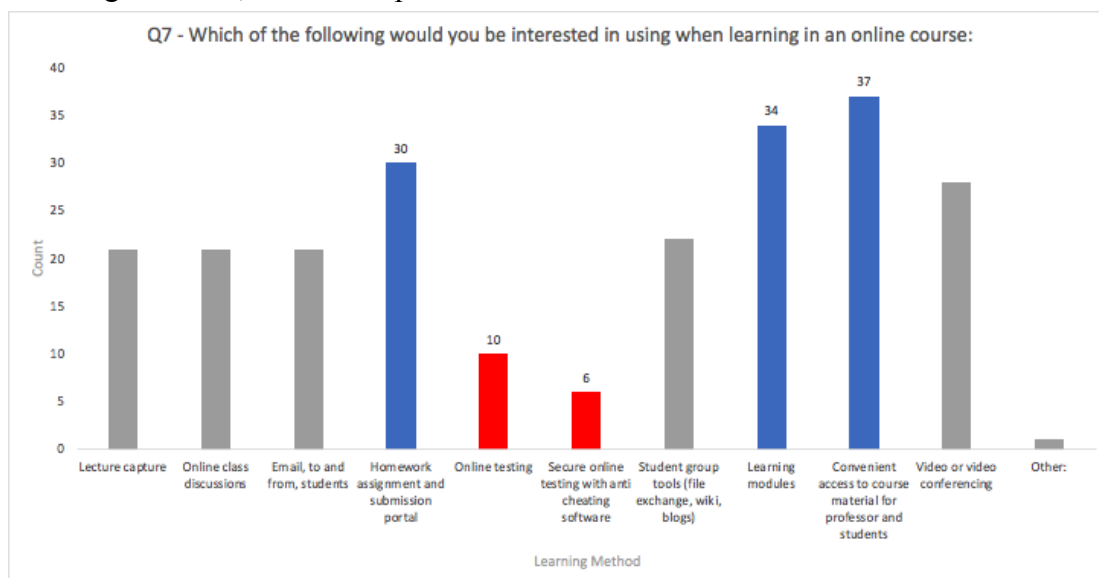
Figure 20: Student Survey Question 7

Question 8 (Figure 21) asked students if they currently use direct messaging (such as Slack, Microsoft Teams, or Discord) to interact with classmates and/or professors. Around 66% of students responded Yes, while 33% responded No. Current usage of these apps show to be in the majority.
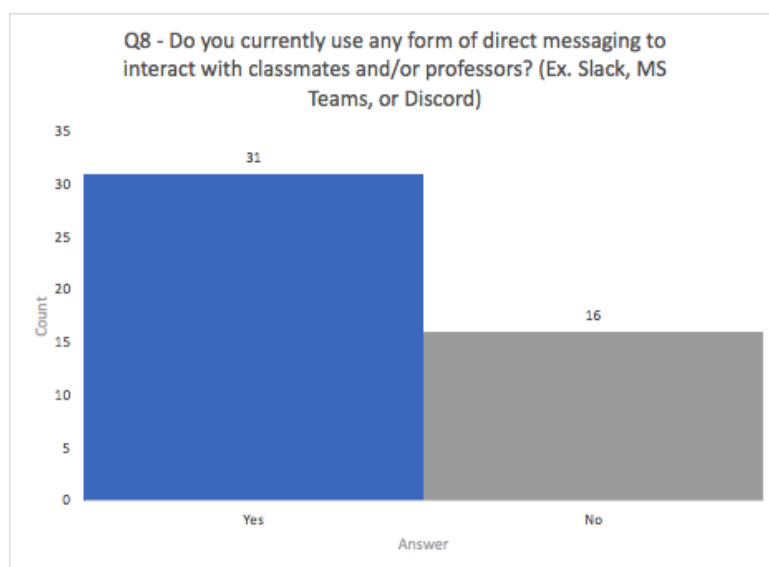
Figure 21: Student Survey Question 8

Question 9 (Figure 22) asked if students would be interested in using direct messaging with classmates and/or professors if they do not already. 42.55% of students said yes, 12.77% said no, and 44.68% said they already do so. Aside from the 45% of students who are already utilizing direct messaging apps, like Slack, MS Teams, and Discord, Question 9 indicates there is a more significant portion of students (43%) who would be interested in implementing said apps in the classroom while 13% oppose it.

The Qualtrics survey also asked students to leave any suggestions or comments on how to improve online graduate learning satisfaction and engagement (Appendix G). In this optional section, students expressed the desire for more synchronous opportunities for lecture and discussions, as the consensus was that discussion boards do not work as a replacement for real-time conversation. Some students also mentioned that Canvas organization should be standardized further to minimize confusion about locating class materials. Finally, when asked which of the following students would most be interested in using when learning in an online course, students indicate that they are more interested in "Convenient access to the course material for professor and students."
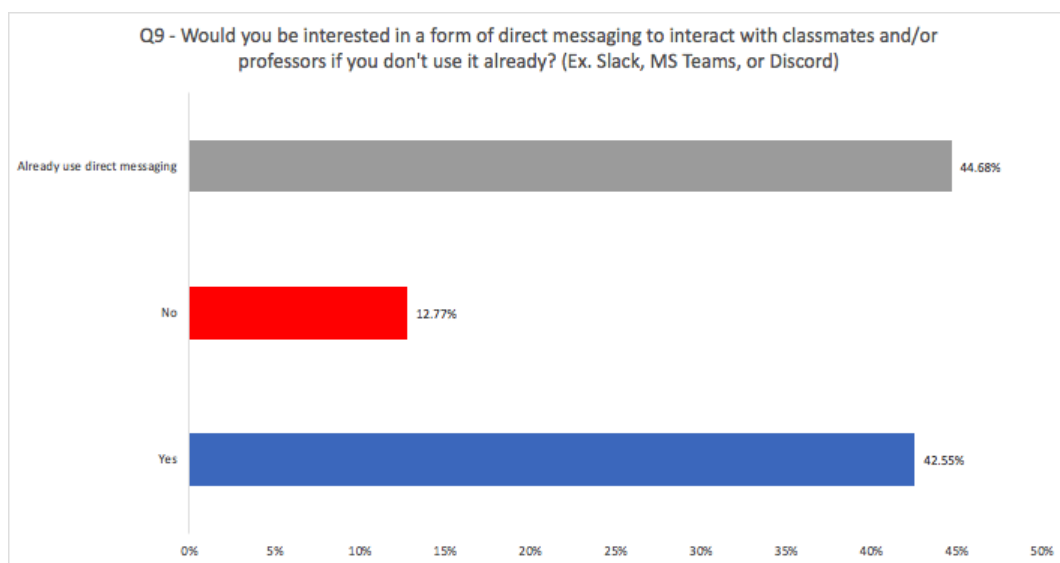
Figure 22: Student Survey Question 9

4.6 Student Survey Analysis

From the qualitative results of the survey and student interviews, we found that students want to see more interactive teaching methods in their courses. Although we see high levels of engagement and satisfaction relative to other teaching formats, students seek innovative tools to foster and improve their learning experiences.

5. Recommendations

In this chapter, we discuss the recommendations we created in the context of our interviews, surveys, and background research. We made recommendations that are appropriate for the current implementation, as well as recommendations that the Business School may want to consider in the future.

5.1 Course Structure and Discussion

Students in our interviews and Qualtrics survey expressed their desire for more synchronous opportunities in their online graduate business courses. As discussed in Chapter 4.4, student interviewees pointed out that meeting candidly with their professors would help humanize the asynchronous online experience. With that said, we recommend that professors hold optional Zoom (or another preferred virtual communication tool) meetings once or twice a week for lecture review, course questions, discussion opportunities, or for any other activity that may be useful. One student wrote that synchronous discussions "will help reduce anxiety about the permanence and exact wording of responses, …allow[ing] for more interaction with peers and more natural" conversations.

A popular trend in the suggestions section of our student survey was criticism of discussion boards. A student suggested that professors refer to the discussion boards currently run by Professor H (Appendix G). This professor views discussion boards as a significant opportunity for reflection, analysis, and peer coaching. Professor H splits students into small discussion groups on Canvas to encourage peer interaction in their courses. In an interview, Professor H emphasized the importance of constantly experimenting with their course and discussion boards. They brought to our attention the absence of any required discussion board-related questions on student course evaluations (Appendix B). Therefore, we suggest reworking course evaluations include questions that target the asynchronous online experience, such as those rating a professor's use of discussion boards.

We would also like to emphasize the value of simulations for group work and course engagement. We interviewed a couple of professors who use Marketplace Simulations to encourage teamwork and allow students to apply course knowledge to realistic situations. We believe that incorporating simulations into classwork, when relevant, can be an opportunity for maintaining student engagement during online graduate courses.

Both WPI in general and the WPI Business School have guidelines for online teaching best practices (Appendix I and J). However, students in our student interviews and student survey expressed the desire for further standardizing Canvas formats. The vast majority of surveyed students cited "learning modules" and "convenient access to learning material" as having worked well in their online learning experiences. However, one student expressed how difficult navigating course pages can be when different professors organize their courses differently. For example, some professors use the Assignments tab in Canvas to list coursework, some primarily use Modules, and others may post important coursework updates in

Announcements. To improve the student experience and reduce time spent on locating course materials, we recommend that the TPC and/or the Business School reevaluate the standards for course construction. We also recommend that the Business School or the TPC gather information on how each professor organizes their courses so that student feedback can be discussed with context.

Multiple students from our interviews and survey mentioned their professors' use of Slack. Not every professor uses the platform (only 15% of professors surveyed use some form of direct messaging), but the majority of student survey respondents either already use direct messaging in their courses or would like to start. Professor B explained to us how student engagement has decreased as more courses have switched to online formats. They detailed how hosting discussion boards and other course communications on Slack is an easier way to engage students, as the direct messaging format is more familiar than the more formal Canvas discussion options (Appendix B). Due to the positive student response to direct messaging platforms, we suggest that professors consider exploring them as an option for course communication and discussion. To engage students with the structure of their course, professors should consider setting aside time in the first class of each course for a brief vote on what ways students prefer to communicate about course discussions, assignments, and updates.

5.2 Professor Communication

While making changes to the structuring of online courses and the discussions within those courses may be beneficial, these recommendations fall short of completely addressing the heart of the social disconnection issue. Although messaging platforms such as Slack, Microsoft Teams, and Discord can help professors connect with their students, professors are still disconnected from communicating with other professors. In addition, with graduate business learning being entirely online and undergraduate business learning often having remote options, there is less opportunity for professors to share their experiences with educating tools and techniques.

We recommend that the WPI Business School hosts opportunities for inter-professor communication once every academic quarter. These opportunities could be in the form of virtual or in-person town halls, online forums, or anonymous surveys with a public sharing of results. This would allow professors a safe and designated space to ask each other questions about their teaching styles, what has or has not been working for them, what new things they might be interested in trying, etc. These opportunities can help bridge the gap between professors and allow them to learn from each other.

We would also like to suggest a general recommendation for WPI Business School faculty and professors: "Use tools that you have to the best of your ability, but be willing to learn more about them (Appendix B)." One of our main original recommendations was for professors to use Slack, but we have since decided to explore the idea with a broader lens. Professors should be cautious of using platforms just because they are "the platform to use." Slack may work for one professor, their teaching style, and content, but that does not ensure that it will work for

other professors teaching other courses. Different courses work best with different formats. It is also important to remember that every professor is unique, with teaching styles and strengths that may shine in different environments or tools.

Some professors may already have teaching methods and tools that they find work well. Professor H mentioned how a "culture of individualism" amongst faculty could stall change and prevent experimentation, which is crucial in developing solutions for the lack of student engagement in online courses (Appendix B). However, it is worth exploring other methods that may add more value to courses by increasing student engagement and decreasing professor workload. There is always more to learn. Professors who may seem on top of all of the newest trends are constantly learning and always trying new things. Instead of approaching new teaching tools and environments with hesitance, professors should approach them with curiosity.

5.3 Future Recommendations

We have also considered recommendations that are out of scope for the present moment but may be interesting to consider in the coming years. At the beginning of our research, we looked into other online learning experiences. Khan Academy, Salesforce Trailhead, and Duolingo are all examples of free, online, gamified learning experiences. This learning style engages users by providing a sense of achievement through customizable profiles, badges, progress bars, and/or competition with peers. We believe that looking to gamify part of the graduate business program at WPI could be an exciting pursuit. LMS plugins, such as Badgr or Delphinium, allow instructors to build learning pathways for the student experience and reward students with badges and more visible progress than the typical Canvas module experience (Badgr Knowlege Base, n.d.) and (Jordan, 2020).

Professor G outlined an idea for visual progress tracking not only in individual courses but also between them. Students would track their overall program progress in this way, as a more visually compelling and gamified version of current degree tracking sheets. This would help students view their experience at WPI as a fulfilling journey rather than only as a means to complete degree requirements. Additionally, Professor A mentioned a lab that could be a candidate for VR adaptation (Appendix B). This lab was not held last year due to the course being remote, but VR could be used in the future for labs and exercises in online graduate courses and remote undergraduate courses.

The introduction and utilization of new tools and programs would require some experimentation. Perhaps some of the aforementioned tools could be given 'test runs' in a course with feedback being actively gathered.

5.4 Conclusion

Throughout our research, there was a unifying theme that bridged the gap between professors and students: the desire for more connection through learning. Students, even if they desired an asynchronous learning environment and had busy lives while attending school, still favored personal connections with professors wherever they were available; professors often found themselves missing in-person because it was easier to satisfy that connection. Though education may be taking the virtual path, one thing is clear: both students and professors need to connect in a learning environment to make it a satisfactory experience for both parties. Through our research and recommendations for the WPI Business School, we hope that we have presented solutions to help encourage connection through the learning experience moving forward, and that even the most asynchronous courses in our curriculum can still offer the human element that makes higher education a unique experience in the modern era.

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Appendix A

Professor Interview Questions

1. What course(s) do you teach?
   a. Undergrad and Grad
2. What have those courses looked like (fully online/hybrid/asynchronous/synchronous/in-person)?
3. What do you feel are the most important learning outcomes in your course(s)?
4. What are some top activities/labs/exercises in your course(s)?
   a. Which of these were adapted for online learning?
   b. Which of these could not be adapted for online learning?
   c. What worked, what didn't?
5. (Discussion boards) How do you measure engagement in your courses?
   a. Have levels of engagement changed in your in-person vs. online courses?
6. What techniques or platforms have you used for online teaching?
   a. What would you like to use in the future or are interested in exploring?

Appendix B

Professor and Staff Member Interview Minutes

*Quotations cited from professor interviews in this report are paraphrased from shorthand notes taken during one-on-one interviews and do not represent direct quotations from WPI professors or staff.

Professor A:

Clock Lab
- Could not run the clock lab on campus last year due to COVID
- Started analyzing the COVID testing process
- Does not think it's possible to achieve the goal of the lab asynchronously
    - Clock lab allows students to practice problem-solving in real-time
    - Asynchronously - online HBR operations management simulations
    - VR experience candidate

Quality course
- Making helicopters out of paperclips
- Can do it virtually - send materials to students and conduct the activity remotely

Another lab
- Machine shop course, some IEs take it
- Last year students made a Stirling engine
    - Sent materials to students, students had to figure out good parts from bad ones

Grad students
- Do 2 cases a week
- VR candidate for case analysis

"What is the objective/top-level functional requirement of the MQP?"
- Thinks our goal should be to duplicate the best learning experiences that students have in a live classroom environment
- Every professor should be polled for the top 5 academic activities
    - What is the most important learning outcome
    - Why could you or could you not transition to online learning
    - Need to be solution-neutral
- Are these core learning experiences translatable
- Will VR/MR lend itself to encapsulating these core experiences from a mix of professors

UX Transition
- Business school students learn from each other
- The discussion board debrief students

- Pre Recorded lectures can be a mess
- Using Dragon for lectures
  - Very one-way captures as much valuable information in the shortest amount of time.
- Had recorded office hours even if no one showed up
- Discussion boards went well
- Didn't do helicopter drop and clock lab
- Students work in groups and can unwind cases virtually or not
- HBS spent 1 million on a classroom and put students' faces on screens
  - Cold call method
- The classroom experience isn't the same in Zoom, and professors have less hold on students
  - Lose someone the in-class persona

Ran 3 clock lab sessions
- Can be broken down
- How do you get the animation of the in-class experience?
- Would still have to be synchronous

Professor B:

First time online, the asynchronous, same course will be repeated
- takeaways: How companies use data analytics, social media, POS
  - Consumers have changed the dynamics of the purchasing experience
  - How Products need to adapt to current times
  - Labs/Exercises: Because of being online, discussion boards such as Slack. It was an easier way to engage students as they were familiar with each other before transitioning.
  - Engagement level decreased during Pandemic, not due to technology but because of overwhelming time.

What do you feel are the most important learning outcomes in your course(s)?
- Participation, the contribution from students for the entire class

What are some top activities/labs/exercises in your course(s)?
- Which of these were adapted for online learning?
  - Students come up with a project for data collection
  - Looked like a Survey + Something Else (interviews through zoom, surveys, focus groups)
  - Pre-pandemic: Students visited physical stores to study layout

Participation through talking in class or posting on **discussion board**

What techniques or platforms have you used for online teaching?
- What would you like to use in the future, or are interested in exploring?

- Live Functionality
- Face to Face portion would be very useful

What kind of support and infrastructure did the university provide?
- Workshop series
- However, it was not enough for support
- Professors were burned out from the pandemic work.

Professor C:

Ask about market research
- Experience of students from a survey 1 year ago
- Research into competitors

The big difference between BS/MS and full-time grad
Experience BS/MS student would appreciate is not the same at full-time grad
Understanding that and knowing how to deal with it is a non trivial element
Developing a baseline - how much market research are we doing?
- Looking at similar programs at other schools
WPI instruction is slightly different - speaking language STEM students understand

Market research
- Looking at students who haven't graduated yet vs. recent grads
- Get a sense of how other programs promote themselves during the undergrad experience
    - We are closed off from internal messaging in other schools
    - Will have to infer that how they communicate their brand to current students is similar to how they communicate to external students
    - Develop Qualtrics survey or focus group
        - Investigate how BS/MS events go, how they may change
- 'It doesn't matter how instructors want to do it' it matters what the gold standard is and what we should be doing for our audience
- 1st level research
    - Web research, how these programs position themselves
    - Become a 'secret shopper' and apply to the programs
SIMULATIONS
- Assign students in teams, use multiple
- Bicycle simulation
- Especially works for morning class 8-10
- Another simulation in that class too

Student Experience Survey
- Did a ton of research in the past 4 years

- The first part was for the former dean, and now it's for Dean Jackson
- Did a pandemic survey

Professor D:
1. What have those courses looked like (fully online/hybrid/asynchronous/synchronous/in-person)?
    a. asynchronous (grad), offered as online synchronous last semester, typical 3-hour hour session, made 2 hours, changed to asynchronous to make it more accessible for students, record videos and post materials (case studies, online discussions)
2. What are some top activities/labs/exercises in your course(s)?
    a. Which of these were adapted for online learning?
        i. Group coursework was adapted from being in person to being online through discussion boards, group assignments, and final group project
    b. Which of these could not be adapted for online learning?
        i. Exams and quizzes
    c. What worked, what didn't?
        i. Asynchronous midterms, finals, and quizzes
3. How do you measure engagement in your courses?
    a. From asynchronous to synchronous
        i. A significant challenge for asynchronous courses, teaching style based on in-class exercises, measure engagement several required optional and required assignments
            1. Group course project and assignment: The assignment goal is for groups to get to know each other.
            2. More effective/ innovative for engagement in online discussions
                a. Read case studies each week, 2 teams present case studies, submit video and other teams watch videos and participate in online discussion moderated by teams that present the case study, essential for students to lead
                    i. Promote collaboration and communication. Students enjoy, it's going well, simulate in-person engagement in context of online education, involved in ongoing discussions
        ii. Assignments based on videos he posted, students need to watch his lecture or online resources
4. Have levels of engagement changed in your in-person vs. online courses?
    a. Once closer to the end of the semester, we'll have a couple of weeks devoted to project presentation and project discussion, get together to discuss the first draft of dashboards (synchronous), similar to synchronous in asynchronous, two groups

work together on zoom to provide feedback, planning to invite students to office hours, 45 minutes devoted to each pair of teams, teams present to each other, the professor will be there to monitor the discussion, get involved and engage in project related discussions

b. Does not have a midterm or final exam, has done quizzes but those did not work well, everything is based on projects, homework, online discussion and presentations, did have midterm, final and quizzes for synchronous

5. What techniques or platforms have you used for online teaching?
    a. What would you like to use in the future, or are interested in exploring?

6. Did you get any support from WPI to help make the course asynchronous?
    a. In order to post videos, contacted ATC, cloud space in order to post videos on Canvas, an online teaching training program for faculty members, summer of 2020, has provided anything we wanted, hasn't needed much more

7. Are you interested in a hybrid format?
    a. Not only tries to improve course but it depends on the course, update courses based on Harvard business review publications if the school asks to do hybrid, will explore new ways to do this
    b. Fully online asynchronous is more beneficial for different courses, students from data science, chemical engineering, business, MBA, etc. schedules are tough, asynchronous has been working well
    c. Open to doing hybrid, has done synchronous, asynchronous, and in-person

8. Happy with how you conduct your courses?
    a. Usually gets positive feedback about what they learn and the interactions they have with him, a lot of students pursue career in business intelligence, implement data driven mechanisms.
    b. The only challenge he has had is grading students' submissions, 65 students, every week there are case discussions, 200-300 comments in discussions, has to read all of them every week, enjoys reading the discussion board comments, grading 65 homework assignments and also discussions is challenging, this year has TA's who help with grading, accuracy, consistency, providing best educational service possible to students

Professor F:

a. Marketing course - post-pandemic online
    i. Simulation game (uses 'Marketplace Simulations' as software)
        1. Make marketing strategy decisions
            a. 8 quarters
            b. First 4 quarters submitted face to face
            c. Last 4 submitted outside class

        d. Make presentation at end of class

        e. New market research based on each previous quarters

    2. Have all data from every team did on Prof.'s side

        a. Reflective papers from all students, helps to show thought process went through to make decisions

    3. Purpose of simulation is to apply what is learned to make strategies used

  ii. 1 section asynchronous online

  iii. 1 section face to face

2. What are some top activities/labs/exercises in your course(s)?

    a. Besides simulations, also use Canvas, Zoom, Qualtrics, Slack

      i. Finds Slack to be easier for announcements than Canvas

        1. Goes directly to student's phone and can respond quickly on all ends

          a. Has open student cafe spaces where people can just chat

          b. Work spaces

          c. Q&A/FAQ

          d. Announcements

        2. Wish WPI would have a site license for Slack

          a. Helps so much for asynchronous collective learning

3. How do you measure engagement in your courses?

    a. Have levels of engagement changed in your in-person vs. online courses?

      i. Simulation class wasn't taught until post-pandemic

      ii. Format works both in person and asynchronous to use simulation game

4. What techniques or platforms have you used for online teaching?

    a. What would you like to use in the future, or are interested in exploring?

    - Canvas, video conferencing , Wevo, qualtrics, Slack (for communication)

    - Slack has many possibilities (announcements, Cafe space, main channel)

Scheduling is always a challenge, people are at different points in their life trying to make them all meld with different demands on their time.

- Matching up for 5 people is difficult, also timezones make it difficult.
- Don't know when forming teams where students are located and therefore don't know about timezone conflicts until after introduction - even more difficult to find out in asynchronous classes.

- First time taught online was Fall 2020 last year
  -Had summer to prepare

One of the best parts of being a professor is interacting with students
- Don't get to see that with asynchronous, felt a void
- Students faced challenge because Professor wasn't there in person to guide them
- talking in person is different than talking online

Needed someone to help with video editing, converting presentations to video format (TA's don't know how to help as they are not trained in this, Camtasia)
- Didn't get that support as much as needed, might not have the right equipment (e.x. Laptop with enough space to do video editing)
- Completely different format for teaching
- Took TWO WEEKS to create one 5-minute video
- Needs to be professional quality content since the standard is so high now
- Also needs to have subtitles to be completely accessible for all
- Appropriate colors for colorblind audience

Professor G:

What has been your experience with the instructor side of Canvas? What analytics are you given and what do you find most helpful?
- Two sets of analytics
- 'New analytics' tells you everything a student is doing, how long they look at documents and videos (canvas studio) (for example: if people are skipping through lectures)
  - 10 min vs 40 min lectures
  - The TikTok-ification of content is expediting content
  - What order students are doing things, when they are doing it
    - Can see when students start and stop their videos
      - Can show 'active' versus 'non-active' tabs (especially for quizzes to catch cheating, etc.)
    - Can see when students are opening (or not opening) documents
    - Can do check-ins or learn about the difficulty of your assignments
  - Can feel a bit creepy
    - Had a student who did an assignment incorrectly
    - Checked-in and found through analytics that the student hadn't opened any of the coursework or materials
- Some students are better at certain areas of the course
- Canvas doesn't make analytic results obvious, you have to seek it out

- Faculty Institute of Learning - resource for professors to learn more about how to use Canvas, online learning modules, etc.

http://www.dungeonsanddevelopers.com/#_a2b_13_Your%20Name

Law of 20/80 , Professor G suggested that students focus on the more important details to get through the bigger obstacles rather than the bigger portion.

Taught using IM platforms (discord, slack, teams)
- Datawise
    - Differences how they are used based on different majors
        - Business majors use it more as a texting platform, etc.

Look into Slack permissions*
Teams is OK for courses (official WPI messaging platform)
- Canvas integration isn't great
- Don't get notifications sometimes

Personal goal w/discussions
- Emulate class discussions
- Some students follow the standard that a lot of other professors use
    - 1 long post, two short replies

Top recommendation
- Use tools that you have to the best of your ability but be willing to learn more about them
- Canvas is still releasing new features so there is always more to learn
- Think from the perspective of students, use the 'student view' and see if it makes sense
- Professors shouldn't use platforms just because they are "the platform to use"
    - Platforms should be adding value to the course
- Platform will be decided by the audience (Students)
- Share experiences with faculty
    - Possible recommendation: a town hall for professors every once in a while where they can share what does and doesn't work for them. No professors really know how other professors teach their courses and if they could share that could help benefit all.

Professor H:
What specifically about your DBs do you think appeals to students and sets them apart from DBs in other courses?
1. volume/quantity component, quality>quality

2. Coaching component
    a. Offer deep feedback/coaching on a few discussion boards per semester
3. Early in the semester, students do an intro and a social discussion board

Students feel like they're wasting their time when their posts don't get acknowledged
- Can engage because quantity is strategic
- Some learning objectives are best served with deeper discussion boards
- Some profs use DBs as classroom discussion (~5 posts per week)
- Purpose is strategic
- A couple easy 60 person discussion boards, then break into small teams
    - More manageable for students when they only have to read 4 posts
- By thursday of every week, students must post
    - second round students read each other's posts and offer feedback
    - Rounds to about 3 posts a week

Changed this semester
- Coaching students who are struggling more
- Students who aren't as engaged

Do you currently use any channel based apps? Such as Slack, MS teams
1. Slack-heavy four years ago
2. Real-time discussion isn't a big component of these discussions
    a. Topics require significant thought and reflection
3. Simulating conversation can be good in other courses
    a. These DBs are trying to teach engineers to be *reflective*

Students are terrible at coaching on the first DB
- Cheerlead ex. "I like what you said here"
- After being coached (3rd or 4th iteration) they can be honest about their opinions and help each other improve
- Call out when they see something not quite right

Advice to other professors
- Get a snapshot of how students perceive your methodology
    - Ask anonymously how methodology is performing
- Based on the snapshot , board serving the learning objectives? Board advancing learning objectives or just filling space
- Try something new, A/B Testing, Post testing
    - If small groups aren't working, try big groups and vice versa
- Some professors see discussion boards as a necessarily evil (students don't like them but they are good for students)
    - Reluctant to experiment

- Continuous Improvement
    - Always fix and experiment as you go
- What are the consequences for professors who don't meet student standards?
    - Adjunct professors can be asked to leave
    - Tenured professors/research professors are a different story
        - Can try to coach them, give small classes, give extra service
        - Giving small classes or doing load reduction is kind of what they want…
    - No annual departmental teaching award
        - Good professors aren't rewarded
        - What is the incentive for 'checked-out' professors to improve?
- Really values discussion boards as ways for students to express themselves

Consider
1. Idea of isolation
    a. Get assigned a DB partner
        i. Peer-peer coaching/buddy system
    b. Work together to look at DBs
    c. Vance Wilson gets mentioned as another prof who does well online
2. Add a question about DBs in course evals
    a. Scale
    b. Routine feedback about the quality specifically of discussion

- Mixed feelings about town halls
    - Lots of thinking and talking but not a lot of action
    - Strong bias for action and experimentation
- However, there has to be dissatisfaction to ignite change
    - Also has to be a vision for the future
    - Tangible future steps
- Other faculty members don't care when they share teaching approaches lol
    - Huge resistance to learning from others
    - Morgan teaching center - one place where faculty members are willing to go
        - Ego issue
        - Culture of individualism
            - Faculty get hired because they get published, are bright, can design or execute a course
            - The way faculty get brought up doesn't always have team orientation
                - That autonomy is good and beneficial, but also has a dark side: resistance to being open to information from other faculty members

- - Can't solve that, but solve tiny things such as DBs
- Organizational culture: hit a wall, trying to change is overwhelming
    - Takes a decade for culture to change
    - Culture is a pattern that has developed over time
    - Habits and routines are where culture can begin to change
        - **What can we experiment with/fix in the next 90 days to get the ball rolling?**

Do you think the leadership change (WPI president) will introduce major problems?
- Tendency to think a new leader will solve all issues
    - Form of dependency
    - These leaders come and go
- The answer to the issue is not one person

Staff Member A:

How many total students are in the graduate business program?

About 400 total, across MBA and MS programs

- How many of those students are previous undergraduate students from WPI?
    - A growing number, MS in management, covid slammed the breaks on international pipelines, making up most graduate students.
    - Send an email to gan et exact number
    - Has it just been a shift in international students?
        - MBA has gone up, blended courses come in every seven weeks, not enough students, couldn't commit to being here every 7 weeks
        - Most specialized masters are available online and in-person

How many are current BS/MS students?

- 150-200 changes daily, only two admission periods
- Meets with these students daily
- Some students are not officially BS/MS until after the application process but are registered for MS classes
- Increased due to COVID, students are not struggling to find jobs, employers would push back start dates, better use of time to spend time in graduate school
- WPI undergrads are seeing the logic in getting the most out of their money
- I can usually fit it into a 4-year window
- More awareness among students
- Students most often finish off MS part-time after graduating with BS
- Tend to do MS in management
- Trying to market more

- (IT, UX, Operations Management) most affected by COVID

Average MBA student was 35 years old with young families
- the gradual shift to heavy international with specialized masters, now a heavy focus on BS/MS students
- here for the network and expect to be with senior professionals
- the online delivery model is asynchronous, traditional grad students need the flexibility due to personal lives and work, encourage weekly synchronous opportunities (not mandatory usually)
    - Guest Lectures, Office Hours, to give students the face to face online time
    - teaching committee to share best practices consistency to the structure of courses

Staff Member B:

What are your responsibilities? Redesigned to be fully online compared to blended learning
- However, now student advising, undergraduate GPCC, high level of strategic vision of MBA,
- Works on assurance of learning for AACSB (Accreditation)
- https://www.aacsb.edu/
- Discusses syllabus templates for faculty (not too rigid, more of a guideline to follow)
- Deliver best practices to faculty
- Once a month meets with faculty to discuss best practices
- FIAT
- Social Media work for the business schools

- **How have those changed since the pandemic?**
    - Not have to coordinate face to face meetings twice a semester
    - Looking to faculty canvas sites to make sure specifically are building an online community
    - Very important to build a community as online learning becomes predominant

- **We know that the MBA program was already making a shift towards online learning, how did the pandemic affect this?**
    - 48 to 36 Credits
    - Discounted tuition
    - Credits are $1600, now $1200
    - Standardizing best practices while not being rigid to eliminate professor's

- Could you describe the responsibilities and functions of the TPC?
    - Started this fall, to teach faculty to

- **What are some online teaching best practices that you have observed?**
    - With larger class sizes, more discussions regarding best practices were taken

Staff Member C Interview 1:
Staff, work through academic technology center, teach 0 credit graduate course for people that wanna become teachers

ATC- faculty development, help design courses, handle strategic planning, fill gaps in understanding of teaching, faculty learning communities- share ideas get feedback, some are a month or longer to put teachers in role of students to experience it from students perspective, make them be an asynchronous students in canvas, learning how to manage workload, supporting faculty in anything effective teaching

Been at WPI over 5 years, program with external consultant 1-2 week program she changed to 4 week program, adjusted to emergency planning for covid

Faculty said course was a life saver, from what we learned in interviews

Steps taken to make the course more tailored to teaching online?
        A lot of it was going back to basics, most faculty don't have training in how to be a teacher, emulate what they had in the classroom, use inherited material, teach them basic design process, thinking of outcomes before course starts (backwards teaching), what does the outcome for students look like at the end?, base course around outcome and learning objective, faculty understand some of this but not all, going through process is important, students need to know what the expectations are, need for more structure and different ways to communicate that are lost in online classes, barriers include not being able to see students body language and facial expression or being asked questions after class, comes back to basics as good teaching

Essentially a course of how to be a better teacher not necessarily just teaching online, faculty have different comfort levels with teaching online

How did you participate in best practices for online learning?
        Was pre existing content from instructional designers, aligning content with her modules, checklist of things that should be in faculty's course, second instructional designer added content and had been faculty support before added what to look for in courses, get them to change 1 thing or strategy that's a win, having learning outcomes outfront and super easy change to have this written, break down so any person can make little changes like how things are titled in

canvas, this tends to be overlooked but is super helpful for students, give faculty an idea of where to start

WPI seeking third party vendors, all campus, do you have experience working with them?

No, part of early discussion to bring in this company when figuring out which company to bring in, could be helpful for marketing reasons, WPI is unique situation and you need to have that understanding, not every class can be the exact same as the third party vendor typically does, Brandeis did have a little experience with key path didnt have a great experience, could be very beneficial, interested to see how it plays out

Instructional design community is very collaborative, a lot of faculty don't have teaching experiences, more faculty driven, universal design for learning and accessibility, equity learning using universal design is Caitlin's expertise

Faculty have mentioned accessibility, how do you implement that?
Universal designed, shouldn't need accommodations since everything is accessible for students, students have needs in other ways that don't have a diagnosis, idea is how do we build this in to the course and faculty approach in a way that is best for them, curb cuts invented for people with wheelchairs works for everyone shopping carts, strollers, closed captioning in a classroom is a big one and works for everyone, personal preference plays a part, having autonomy or having control over learning environment, having that safety makes students for engaged, plus one method- create video, annotated slides or captioning, post transcript incase people don't want to watch videos, open script to find sections to revisit, giving options is important, are there other ways for students to show knowledge aside from exams if students are poor test takers but know material, change the way students submit answers

Main obstacles in designing a course and implementing all those things, does WPI have some sort of learning measurement tool they already have that is at ease?

Some people use dragon to automatically transcribe, most video tools have it and they are edible, professors can download document and post it, good course design takes a lot of time, turn around time is difficult and was worse during the pandemic, good course design is a 6 month process from start to finish, figure 8-10 hours of work a week for 3-6 months, once it's there you have it and is easy to go back and change, try to avoid putting in date for content that's not going to change, intro videos change for each course, auto captioning takes time since it doesn't always come through, faculty are over burdened and it's a lot to ask

Does WPI using software that's in place right now, compete with other online courses?

Have a lot of resources for video however there is a shortage of staff, faculty driven process, cannot just film video and hand it off to graphic designer to edit, third parties make

$40,000 produced videos, mooks are too impersonal, data on students not caring about production value, super polished makes it feel like a ted talk, prefabricated- prefer personal interactions with their professors

Eli: faculty feels the opposite to be true and faculty and try to perfectly edit their videos, students want personal experience with professors and be able to reach out with questions

Professors are perfectionist, hard for them to not put perfectionist view forward, recording themselves ahead of time is hard to see themselves say uhm, make mistakes in class all the time but it is not something they have to keep rewatching, high production value things are not necessary for what they're doing, students don't care about production value and it is hard when produced courses are what they compare themselves to

Staff Member C Interview 2:
What is currently being offered in terms of instruction for professors using Canvas?
- 1 canvas admin handling backend
  - Adding features, communicating those
- Documentation and blogs
- Offer end of summer drop-in workshops, esp for new faculty
- Faculty can schedule 1 on 1 training
- Polleverywhere, video teams
- Lots of professors asking for 1 on 1 instruction
  - Almost everyday have some sort of question
- Always have sessions for new faculty

Does the 'Best Practices for Online Learning' ATC offered course currently have a section dedicated to Canvas?

How often do professors reach out to the ATC for help with teaching online?

Can you walk us through the capabilities of Canvas on the instructor end?
- Chris in the UX department mentioned how he uses Canvas analytics
- Are there resources at the ATC for demonstrating how to use Canvas analytics?
  - Some professors are involved
  - Tends to be courses where they are using canvas for participation
  - A lot of professors don't realize how in-depth the data can be

Ongoing conversation
- Linking canvas data to academic advisors to see if participation or grades are falling off
  - Helping to understand whats going on with students for outreach
  - Being on top of student engagement
  -

- Some professors use quizzing data to determine if they're assessing students are material appropriately
    - Busywork vs too difficult
- Video engagement
    - Requires external tools
    - Not just a question of participation, can help to see how students were using materials (rewatching video segments)

We're also looking into how an LMS like Canvas could be gamified with badges, leaderboards, visible progress bars etc. (similar to the Khan Academy experience) - this can be achieved with Canvas plugins
- How would you describe the experience of introducing new teaching tools overall?
    - Start every feature with a group who is interested in the problem
        - Starts with a communicated need
        - Exceptions sometimes, such as Accessibility Checker
            - Sometimes based on historical data
            - Write a blog or send something out
    - The ATC makes things very customizable and interactive
    - Gradescope (Paper based grading scanning system)
        - Might fund this one to cut back on less-used features
    - Pilot new features from a semester-year
    - Can turn on features for a small group
    - Sometimes it takes the right person to kickstart usage of feature/tool
    - Professors might present features to a larger group of faculty
- Are adoption rates high? Are professors very willing to try new things?

You mentioned in our last interview with you about 'accessibility first' universal design, what parts of Canvas help offer accessibility to both students and professors?

Does the ATC currently offer additional services for course integration for professors? e.x. Helping a professor set up a communication platform such as Microsoft Teams, Slack, etc.
- https://wp.wpi.edu/atc-ttl/
- Don't manage office365, so there is some overlap with ITS

Huge range of faculty
- By the volume of tickets, there is at least basic use by pretty much all faculty
    - Anyone interested in flipped or hybrid classrooms are using it more
    - Forced expansion from the pandemic
        - Calendar and gradebook

- Document repository
- 90% buy in (adoption rate)
- Other percentage, professors using their own website (CS site)
- 95% used it at some capacity
    - Professors realized that assignments are beneficial

Appendix C

Professor Survey Questions

1. What graduate course(s) have you taught? (text box answer)
2. What have those courses looked like? (fully online/hybrid/asynchronous/synchronous/in-person) (select multiple)
3. How satisfied were you with your experience teaching in this format? (satisfaction level options)
4. Please rate your satisfaction with student engagement. (satisfaction level options)
5. Please indicate your experience with the following tools/software/resources when teaching online: (matrix format, worked well, didn't work well, didn't use it)
    a. Lecture capture
    b. Online class discussions
    c. Email, to and from, students
    d. Homework assignment and submission
    e. Online testing
    f. Secure online testing with anti cheating software
    g. Student group tools (file exchange, wiki, blogs)
    h. Learning modules
    i. Convenient access to course material for professor and students
    j. Video or video conferencing
    k. Other:
6. Which of the following would you be interested in using when teaching an online course:
    a. Lecture capture
    b. Online class discussions
    c. Email, to and from, students
    d. Homework assignment and submission
    e. Online testing
    f. Secure online testing with anti cheating software
    g. Student group tools (file exchange, wiki, blogs)
    h. Learning modules
    i. Convenient access to course material for professor and students
    j. Video or video conferencing
    k. Other:
7. Do you currently use slack or another form of direct messaging to interact with students? (yes/no)
8. Would you be interested in using slack or a form of direct messaging to interact with students if you don't use it already? (yes/no/ already use slack/direct messaging)

9. How many hours do you spend preparing material for an in person course? (options for 0-40+ hours)

10. How many hours would you spend on a course per week while actively teaching in person? (options for 0-40+ hours)

11. How many hours do you spend preparing material for an online course? (options for 0-40+ hours)

12. How many hours do you spend during a typical week while actively teaching online? (options for 0-40+ hours)

13. Have you ever contacted the IT help desk when you've needed assistance? (no/ yes is text box response)

14. How satisfied were you with the support you received from WPI to prepare for online teaching? (satisfaction level options)

15. What support did you receive or what support would you like to see provided by WPI in the future? (text box response)

16. Do you have any suggestions or comments? (text box response)

Appendix D

Student Informal Interview Questions

1. What graduate courses have you taken with the WPI Business School?
2. Why did you choose to take these courses?
3. Are you a BS/MS student?
4. What has your experience been like taking these courses? How have these courses been delivered? (in-person, online or hybrid, async vs sync)
5. Does your experience in online graduate courses differ from your experience in online undergraduate courses, how so?
6. Does your experience in online courses differ from your experience in in-person courses?
7. What would you change about online graduate courses?
8. What works well in these courses?
9. What doesn't work well in these courses?
10. Would you recommend these courses to another student? Why or why not?
11. Overall, how would you rate your experience taking graduate courses with the WPI Business School?

Appendix E

Student Informal Interview Minutes

*Quotations cited from student interviews in this report are paraphrased from shorthand notes taken during one-on-one interviews, and do not represent direct quotations from WPI students.

Student 1:

1. What graduate courses have you taken with the WPI Business School?
    a. 1 course - Technology Commercialization, Theory, Strategy, and Practice ETR 593 taught by Prof. Paul Delby (?)
2. Why did you choose to take these courses?
    a. Norm chose it as part of the BS/MS track
3. Are you a BS/MS student?
    a. Yes, going to part-time finish masters while working
4. What has your experience been like taking these courses? How have these courses been delivered? (in-person, online or hybrid, async vs sync)
    a. All asynchronous online, lectures uploaded (PPTs with voiceover)
    b. Coursework is project-based
    c. Working with 6-8 people
5. Does your experience in online graduate courses differ from your experience in online undergraduate courses, how so?
    a. Lectures don't match up well with project work, narrated PPTs < normal recorded lectures
    b. Differently paced, working with students who aren't undergrads presents different challenges (scheduling with full-time workers)
    c. Prefers 7 weeks as full-time student, would prefer semester as a part-time student
6. Does your experience in online courses differ from your experience in in-person courses?
    a. Yes, it's easier to be accountable in in-person classes
    b. Would rather be in-person as a full-time student
7. What would you change about online graduate courses?
    a. Varying coursework, grad courses can become repetitive
    b. Recorded lectures vs ppt voiceovers
    c. Or have videos made specifically for online learning
8. What works well in these courses?
    a. Assignments have been educational and well-designed
9. What doesn't work well in these courses?
    a. Ppt lectures
    b. Lectures not lining up with projects (part of it is meant to be independent)

      i.   Lectures cover lots of material- broad

     ii.   Projects give vague problem statements and leave most of it to students' discretion

   iii.   Don't need the lectures to do the projects

10. Would you recommend these courses to another student? Why or why not?
    a. Yes, professor has lots of real-world experience to share
    b. Has put lots of effort into the material
    c. Maybe would be more valuable if there was an in-person option, easier to ask questions and pay attention

11. Overall, how would you rate your experience taking graduate courses with the WPI Business School?
    a. Overall pretty happy, liked working in teams
    b. Professor does a good job of providing insights
    c. Full-time working team members have unique perspectives

Student 2:

1. What graduate courses have you taken with the WPI Business School?
    a. 4 grad classes: MKT 500, MIS 584, ETR 593, OBC 505

2. Why did you choose to take these courses?
    a. Data Science BS but wanted to expand options with a grad degree in management
    b. Norm picked courses

3. Are you a BS/MS student?
    a. yes

4. What has your experience been like taking these courses? How have these courses been delivered? (in-person, online or hybrid, async vs sync)
    a. MKT 500 was in-person but went to fully synchronous
    b. OBC 505 has been in-person
    c. MIS 584 completely async
    d. ETR 593 completely async

5. Does your experience in online graduate courses differ from your experience in online undergraduate courses, how so?
    a. Grad classes are more team-oriented and project-based
    b. Grad classes are a little bit easier
    c. OBC is a conversational class, activities in class
        i. Probably wouldn't work in zoom
    d. MKT lots of activities and breakout rooms
        i. Bike simulation w/prof Shah
    e. MIS more stem
    f. ETR very project based

6. Does your experience in online courses differ from your experience in in-person courses?
7. What would you change about online graduate courses?
    a. ETR class has projects not very related to lecture, nothing weekly so engagement is lower
    b. MIS lectures don't correlate with the homework
8. What works well in these courses?
    a. MKT 500 Prof. Shah uses Slack with automatic alerts
9. What doesn't work well in these courses?
10. Would you recommend these courses to another student? Why or why not?
    a. Would recommend OBC and MIS
    b. Not ETR - maybe if it was in-person - not getting that much out of it
        i. Professor is the most responsive, though
11. Overall, how would you rate your experience taking graduate courses with the WPI Business School?
    a. Having a really good experience, good change of pace

Student 3:

1. What graduate courses have you taken with the WPI Business School?
    a. MIS 584, FIN 500, Marketing 500, OBC 505, OIE 501, OIE 553, OIE 553
        i. All online, all have been asynchronous
2. Why did you choose to take these courses?
    a. Management requirement with interest in industrial engineering
3. Are you a BS/MS student?
    a. Yes, BS in industrial engineering, MS in management
4. What has your experience been like taking these courses? How have these courses been delivered? (in-person, online or hybrid, async vs sync)
    a. All grad courses have been asynchronous
        i. Some would read textbook, some would record lectures, very hands off
        ii. Undergrad much more hold your hand
5. What courses did you like better than others?
    a. Finance professor didn't really teach anything
    b. OBC 505, professor was fantastic, cool group assignments, optional zooms and able to interact with professor and other students
6. Does your experience in online graduate courses differ from your experience in online undergraduate courses, how so?
    a. Online undergrad courses were generally synchronous
7. Does your experience in online courses differ from your experience in in-person courses?
    a. Professors were more hands on in in-person courses
8. What would you change about online graduate courses?

a. Professors could've been more hands on and had a better presence in the class

b. Would not change anything about the courses she enjoyed

9. What works well in these courses?
    a. Mostly used Canvas, used Slack for one class (marketing, professor was great)
        i. Did slack work better?
            1. Easier to communicate, slack channel for group, professor would check in using slack and help students stay on track
    b. Optional zooms, could see who you were interacting with on discussion boards
        i. Teach yourself professors were more helpful in the optional zooms

10. What doesn't work well in these courses?
    a. Professors are less hands on when the courses are synchronous, that's why optional zooms are great

11. Would you recommend these courses to another student? Why or why not?
    a. Recommend OBC 505, OIE 501, MIS 584
    b. Would not recommend the rest

12. Overall, how would you rate your experience taking graduate courses with the WPI Business School?
    a. 8/10, zoom has been great, schedule is super flexible and she can go to work
    b. Would give the same rating for undergrad, hasn't been in a classroom since sophomore year

13. Work life balance with taking asynchronous courses?
    a. 9/10, good time management, work 3-4 days a week and can easily schedule meetings and has time to do homework
        i. Works at a bakery

Student 4:

1. What graduate courses have you taken with the WPI Business School?
   ETR 593
   MIS 584
   Marketing 500
   Finance 500
   OBC 506

2. Why did you choose to take these courses?
   BS/MS student

3. Are you a BS/MS student?
   Yes
   Senior, Mechanical bs/Management ms

4. What has your experience been like taking these courses? How have these courses been delivered? (in-person, online or hybrid, async vs sync)
    Marketing is every Tues night (zoom, 1st in person then COVID moved to online)
    Finance optional meeting
    MIS ETR async
    OBC 2 mandatory zoom meetings that it

5. Does your experience in online graduate courses differ from your experience in online undergraduate courses, how so?
    More group-based, less project/studying based
    Smaller breakout group work on own time

6. Does your experience in online courses differ from your experience in in-person courses?
    Takes more time to absorb things, can pause and go back to review
    Had trouble taking notes in-person

7. What would you change about online graduate courses?
    Group work in addition to individual assignments can be overwhelming

8. What works well in these courses?
    Like smaller group work vs. lectures
    Not the type of student who would participate in lecture-based environment, more likely to speak up in smaller group discussions
    Mini lectures work better vs long lectures (specific to topic)

9. What doesn't work well in these courses?
    Async - having some sort of interactive component would help more, currently very limited interacting w/ professor and only 4 assignments makes us feel like we're not participating
    No check-ins/discussion posts, easy to just skip lectures
    All assignments due end of semester is harder to keep on top of than weekly structure

10. Would you recommend these courses to another student? Why or why not?
    Yes
    Originally was going to go into ME masters, decided I didnt want to take another Engineering course
    Want to one day go down project management track vs. Straight engineering track
    If you want flexibility go for BS/MS versus picking a concentration

11. Overall, how would you rate your experience taking graduate courses with the WPI Business School?
9/10
Enjoyed it much more than undergrad experience due to professors desire to actually teach you (more than ME professors)

Student 5:

1. What graduate courses have you taken with the WPI Business School?
   - Finance 500
   - MIS 584
   - MIS 585

2. Why did you choose to take these courses?
   - Part of master's program (UX)
   - Already qualified for, took them so I could get them over with
   - Friend referral (see misc notes)

3. Are you a BS/MS student?
   - Yes (Computer Science BS, Innovation with UX MS)

4. What has your experience been like taking these courses? How have these courses been delivered? (in-person, online or hybrid, async vs sync)
   - All biz classes have been online, completely online & asynchronous
   - Experience: indifferent, would prefer in-person and more interactive and synchronous
   - Finance simulation: Online scenarios from HBS publishing, choose business (Kevin Sweeney)

5. Does your experience in online graduate courses differ from your experience in online undergraduate courses, how so?
   - Undergraduate courses a lot more work and time commitment vs Master's
     - Workload is very different
     - Grad courses more do at own pace, open discussion & deeper level of learning

6. Does your experience in online courses differ from your experience in in-person courses?
   - Yes
   - Definitely prefer in-person courses or hybrid
   - Never gotten to have a hybrid course or in-person course for Masters

7. What would you change about online graduate courses?
    - Most people go to optional weekly lectures, need some sort of structure

8. What works well in these courses?
    - Canvas modules, Slack - felt less formal, more open
    - Professor was very interactive when using Slack, can DM professor, general thread, announcements, HW, office hours, post answers in interactive lecture in Slack channel
    - Use Microsoft Teams for UX class - not as good as Slack but still interactive

9. What doesn't work well in these courses?
    - Some professors don't put links, just say 'you'll find info in modules', don't want to have to go hunting for it. If there's no online option it's difficult to keep up
    - Don't even bother to learn Prof.'s names because we don't interact much, less personable

10. Would you recommend these courses to another student? Why or why not?
    - Yes I would recommend as a fun class: UX
    - Other ones: Only recommend other ones if the person HAD to take them

11. Overall, how would you rate your experience taking graduate courses with the WPI Business School?
    - Total: 8/10
    - Easy to learn and do well despite not enjoying online learning
    - Honestly not that hard

Appendix F

Student Survey Questions

1. How have the graduate courses you have taken/are taking been delivered? (fully online/hybrid/asynchronous/synchronous/in-person) (select multiple)
2. Describe your satisfaction with the following format of WPI graduate business courses:(matrix format, students can give their satisfaction levels for each delivery format)
3. Describe your engagement with the following format of WPI graduate business courses:(matrix format, students can give their engagement levels for each delivery format)
4. How much has your engagement in these courses differed from your engagement in undergraduate courses? (matrix format, students select how different each delivery format is from their experience in undergrad courses)
5. How difficult are these courses compared to your undergraduate courses? (extremely difficult to extremely easy)
6. Please indicate your experience with the following tools/software/resources when learning online: (matrix format, worked well, didn't work well, didn't use it)
    a. Lecture capture
    b. Online class discussions
    c. Email, to and from, students
    d. Homework assignment and submission
    e. Online testing
    f. Secure online testing with anti cheating software
    g. Student group tools (file exchange, wiki, blogs)
    h. Learning modules
    i. Convenient access to course material for professor and students
    j. Video or video conferencing
    k. Other:
7. Which of the following would you be interested in using when learning in an online course:
    a. Lecture capture
    b. Online class discussions
    c. Email, to and from, students
    d. Homework assignment and submission
    e. Online testing
    f. Secure online testing with anti cheating software
    g. Student group tools (file exchange, wiki, blogs)

      h.   Learning modules

      i.   Convenient access to course material for professor and students

      j.   Video or video conferencing

      k.   Other:

8. Do you currently use Slack or another form of direct messaging to interact with classmates and professors? (yes/no)

9. Would you be interested in using Slack or a form of direct messaging to interact with classmates and professors if you don't use it already? (yes/no/ already use slack/direct messaging)

10. Do you have any suggestions or comments on how to improve graduate student online learning satisfaction and engagement? (text box response)

Appendix G

Professor Survey Answers to Open-Ended Questions

Q13_2_TEXT - If yes, for what?

- If yes, for what? - Text
- many issues
- For video capture
- Glitches in the classroom system
- many topics great and small
- Canvas bugs
- Many things. I am a heavy video usage professor with creating, posting, and tracking everything I can for my hybrid courses
- Classroom microphone
- Loading Software
- Best approach for recording videos for online courses
- Room pc zoom problems more
- like a million things
- PC and Projector setup

Q14 - What support did you receive or what support would you like to see provided by WPI in the future?

- Someone came over or I talked to someone
- I have always received excellent support from the Help Desk, ATC, and CPE, where I teach most of my classes
- I would like to have the ability to tie student problems into the course context when contacting Help Desk, so the instructor and student can both be included in Help Desk interactions.
- The rooms need to be easier to use for video capture, microphones, editing, posting, tracking, attendance, and all integrated into Canvas
- Teaching excellence programs
- I think the grades should load automatically from Canvas to Workday (previously Banner). Right now, manual transcription is done and this is an unnecessary, repetitive task that's open to making errors.
- Updated packet at the start of each academic year describing tools that can be used in courses (and what might have changed); e.g. linking to onedrive files directly in Canvas, using Teams
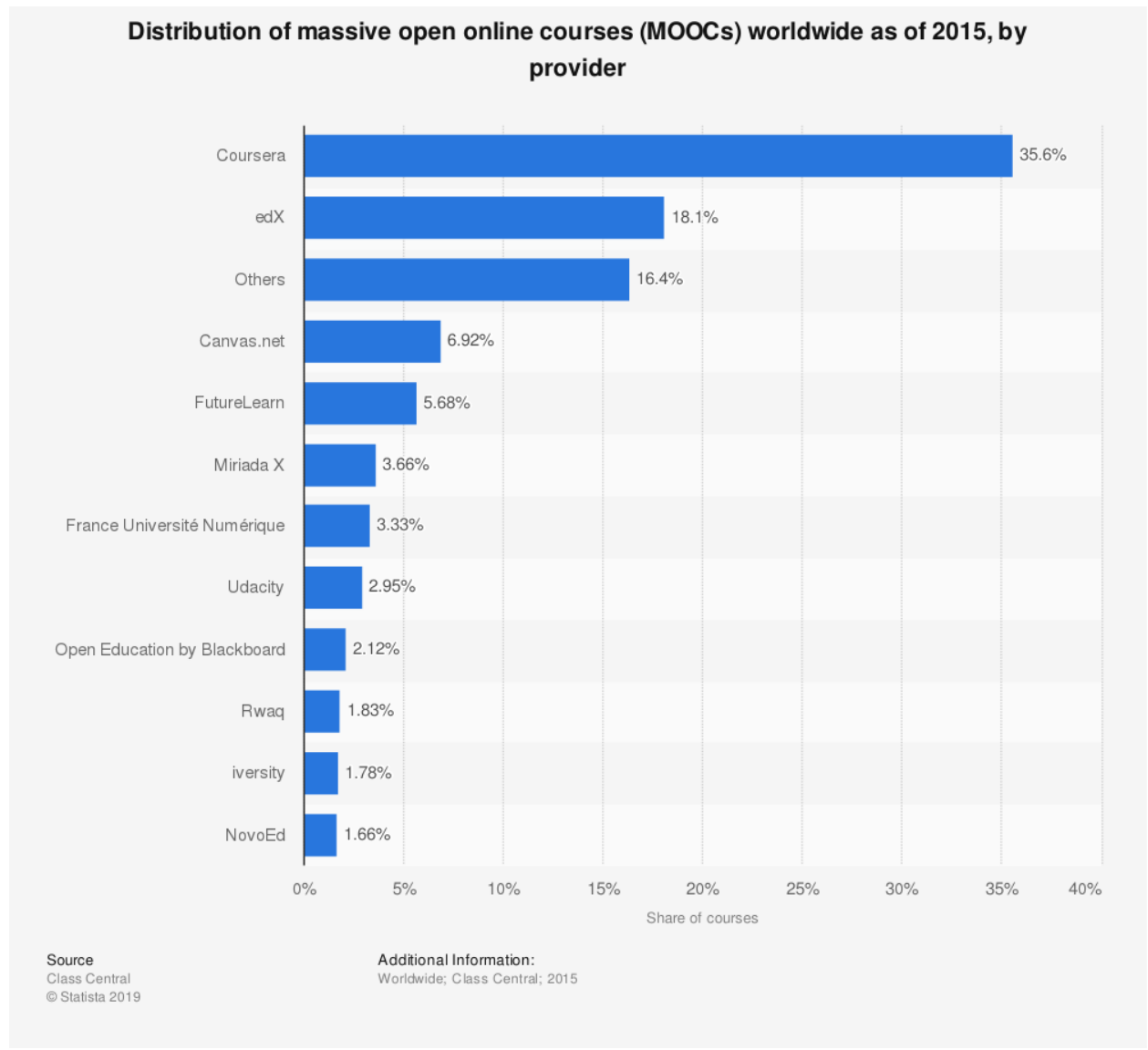
- Help with lecture capture
- GA is helpful
- The FIOT course was exceptional, but a lot of it comes down to trial and error. I don't feel like I need anything else to be better at teaching async.
- Technical

Q15 - Do you have any suggestions or comments?

- Contact me for help with this survey and comments on what could have made it better egonsal@wpi.edu or 774-319-2903
- Teaching online is very similar to teaching in the classroom, except the loss of interpersonal facial expressions and body language is a loss. Humans like time together in the same room. I use a Discussion Board in all my classes. I use Canvas in all my classes. I try to support students in all my classes.
- If we are going to be serious about Hybrid teaching, we need to have the tech that supports that more with the analytics all plugged into the LMS (Canvas). We need better integration with the room resources, microphones, canvas, zoom, our laptops, video editing software, and grading attendance. Too much is manual currently for integration..
- Automate loading grades from Canvas to Workday. I taught for another University and it updated automatically.
- None
- Think I have it under control
- Course prep for the FIRST time I teach an async course is brutal (recording, editing, re-recording if I made mistakes, etc; getting all the weekly modules and instructions just right) but afterwards that I change less than 15% of content for a couple of years (there are always small tweaks from semester to semester...my courses are never 'static'), so I can focus less on my content and structure after the first iteration of a course and more on student interactions. Instant messaging and slack is barking up the wrong tree I think; async is async, and email within 24 hours works just fine. I dislike that Canvas email and Outlook email aren't integrated, and Canvas email is not 'full feature' in the same way Outlook is. It's a hassle to select email addresses, I don't think there's a great search feature, etc. I feel like teaching in our hybrid MBA program prior to the pandemic prepared me well to do a great job with fully async, and I feel like I'm good at async, and my students think so to, so resource-wise I'm all set but I can understand how other faculty may need help. The ONLY thing I dislike about async, or even sync over Zoom, is getting to know the students a little better because there aren't all the tiny, fast interactions that happen before and after class...I just don't feel AS connected with my async students as I do F2F students, and that's the biggest downside for me.

Appendix H

Additional Charts

Distribution of massive open online courses (MOOCs) worldwide as of 2015, by provider

Provider	Share of courses
Coursera	35.6%
edX	18.1%
Others	16.4%
Canvas.net	6.92%
FutureLearn	5.68%
Miriada X	3.66%
France Université Numérique	3.33%
Udacity	2.95%
Open Education by Blackboard	2.12%
Rwaq	1.83%
iversity	1.78%
NovoEd	1.66%

Share of courses

Source
Class Central
© Statista 2019

Additional Information:
Worldwide; Class Central; 2015

Appendix I

WPI Online Delivery Rubric

Worcester Polytechnic Institute

Best Practices for Online Teaching – WPI Online Delivery Quality Rubric

Rubrics	
Course Overview and Information	☐ Course includes Welcome and Getting Started content.
	☐ An orientation or overview is provided for the course overall, as well as in each module. Learners know how to navigate and what tasks are due.
	☐ Course includes a Course Information area that deconstructs the syllabus for learners in a clear and navigable way.
	☐ A printable syllabus is available to learners (PDF, HTML).
	☐ Course includes links to relevant campus policies on plagiarism, computer use, filing grievances, accommodating disabilities, etc.
	☐ Course provides access to learner success resources (technical help, orientation, tutoring).
	☐ Course information states whether the course is fully online, blended, or web-enhanced.
	☐ Appropriate methods and devices for accessing and participating in the course are communicated (mobile, publisher websites, secure content, pop-ups, browser issue, microphone, webcam).
	☐ Course objectives/outcomes are clearly defined, measureable, and aligned to learning activities and assessments.
	☐ Course provides contact information for instructor, department, and program.
Course Technology & Tools	☐ Requisite skills for using technology tools (websites, software, and hardware) are clearly stated and supported with resources.
	☐ Technical skills required for participation in course learning activities scaffold in a timely manner (orientation, practice, and application – where appropriate).
	☐ Frequently used technology tools are easily accessed. Any tools not being utilized are removed from the course menu.
	☐ Course includes links to privacy policies for technology tools.
	☐ Any technology tools meet accessibility standards.
Design and Layout	☐ A logical, consistent, and uncluttered layout is established. The course is easy to navigate (consistent color scheme and icon layout, related content organized together, self-evident titles).
	☐ Large blocks of information are divided into manageable sections with ample white space around and between the blocks.
	☐ There is enough contrast between text and background for the content to be easily viewed.
	☐ Instructions are provided and well written.
	☐ Course is free of grammatical and spelling errors.
	☐ Text is formatted with titles, headings, and other styles to enhance readability and improve the structure of the document.
	☐ Flashing and blinking text are avoided.
	☐ A sans-serif font with a standard size of at least 12 pt is used.
	☐ When possible, information is displayed in a linear format instead of as a table.
	☐ Tables are accompanied by a title and summary description.
	☐ Table header rows and columns are assigned.
	☐ Slideshows use a predefined slide layout and include unique slide titles.
	☐ For all slideshows, there are simple, non-automatic transitions between slides.

Worcester Polytechnic Institute

Best Practices for Online Teaching – WPI Online Delivery Quality Rubric

Content and Activities	☐ Course offers access to a variety of engaging resources that facilitate communication and collaboration, deliver content, and support learning and engagement.
	☐ Course provides activities for learners to develop higher-order thinking and problem-solving skills, such as critical reflection and analysis.
	☐ Course provides activities that emulate real world applications of the discipline, such as experiential learning, case studies, and problem-based activities.
	☐ Where available, Open Educational Resources, free, or low cost materials are used.
	☐ Course materials and resources include copyright and licensing status, clearly stating permission to share where applicable.
	☐ Text content is available in an easily accessed format, preferably HTML. All text content is readable by assistive technology, including PDF or any text contained in an image.
	☐ A text equivalent for every non-text element is provided ("alt" tags, captions, transcriptions, etc.).
	☐ Text, graphics, and images are understandable when viewed without color. Text should be used as a primary method for delivering information.
	☐ Hyperlink text is descriptive and makes sense when out of context (avoid using "click here").
Interaction	☐ Expectations for timely and regular feedback from the instructor are clearly stated (questions, email, assignments).
	☐ Expectations for interaction are clearly stated (netiquette, grade weighting, models/examples, and timing and frequency of contributions).
	☐ Learners have an opportunity to get to know the instructor.
	☐ Course contains resources or activities intended to build a sense of class community, support open communication, and establish trust (at least one of the following – Ice-breaker, Bulleting Board, Meet Your Classmates, Ask a Question discussion forums).
	☐ Course offers opportunities for learner to learner interaction and constructive collaboration.
	☐ Learners are encouraged to share resources and inject knowledge from diverse sources of information in their course interactions.

Appendix J

WPI Business School Online Course Guidelines

WPI | **THE BUSINESS SCHOOL**

Online Course Guidelines

These guidelines were created by GPCC in 2015 and continue to be updated based on best practices for online learning as well as WPI student and faculty feedback.
They are intended to ensure a positive, consistent, successful experience for students and faculty.

Course Organization

1. Canvas course sites should be made available to students two weeks prior to the start of the semester.
2. Provide a video of yourself and/or have a synchronous session (via Zoom) within the first week or two of the course (recorded for those who can't attend live) to introduce yourself. Since we don't an in-person class until mid-semester, we would like faculty and students to get connected as soon as possible. The first time the class will be together in-person isn't until week 7 of the course. In addition, some faculty have found it helpful for students to introduce themselves by posting a picture or video in a discussion board thread.
3. WPI uses Canvas as our Learning Management System. ATC recommends organizing the course using modules.
4. Faculty should include a syllabus that details class expectations, content, and grading guidelines (suggested template coming from TPC in Fall 2021). Faculty should also provide students with contact information and due dates for the assignments scheduled for the semester.
5. Some students like to work ahead to better balance demands placed on their time. Providing class materials and assignments at least two weeks ahead of time will give them the flexibility to do so.

Faculty/Student Engagement

1. Regular engagement throughout the week through discussion board and/or synchronous sessions is needed. Synchronous sessions cannot be mandatory for students to attend. These sessions should be recorded for those who cannot attend and the link should be posted in Canvas.
2. Cohort MBA core courses have predetermined teams of 4-5 students that are created by program management and should not be altered. The teams will remain in place for a minimum of 2 semesters. This creates efficiency for the MBA students who take the two designated courses in parallel.
3. Students are expected to do 10-15 hours of course work per week for each class they take. This includes a combination of readings, discussion boards, group work, course videos, etc.

Miscellaneous

1. Should the cost of the course materials (textbook, cases, readings, simulations, etc.) exceed $200, please contact Sandy Wellinghoff ahead of time so that she can prepare students.
2. All course end-of-course evaluations are completed online by the students.
3. *The program director, Sandy Wellinghoff, will review online courses using the Online Best Practices checklist. This is to ensure consistency and a high-quality delivery for the students.*