Designing an Effective Transition to Remote Learning at Chouaïb Doukkali University

An Interactive Qualifying Project
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Abstract

The goal of this project was to determine the major factors affecting remote education at Chouaïb Doukkali University (UCD) during the COVID-19 era to assist in providing a better educational model for their student body. Our group conducted 3 surveys and 12 interviews with the help of our sponsor, Dr. Youssef Baddi. Survey 1 focused on evaluating UCD students' Internet accessibility, while Surveys 2 and 3 and the interviews centered around student and faculty perceptions of remote education. Based on our findings, our group recommended UCD push for an asynchronous remote model and promote a sense of community and instructor/student interaction. Our group also provided an instructional online course for UCD faculty on how to use Microsoft Teams to host asynchronous remote classes.

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Executive Summary

Introduction

Chouaïb Doukkali University (UCD) in El Jadida, Morocco has faced difficulty in teaching through an online environment amid the COVID-19 pandemic. Dr. Youssef Baddi, our sponsor and a computer science professor at UCD, reported that both students and faculty have struggled to adapt to the new online learning space due to several potential issues. These included a lack of widespread stable Internet connection, a lack of clear structure and course material for remote education, and prevalent hierarchical relationships between students and faculty that discouraged active student engagement (Baddi, 2020). In our project, we wanted to determine the accessibility and usage of the Internet and online resources at UCD. We also aimed to bridge any potential gaps between student and faculty expectations to lessen the negative impact of the COVID-19 pandemic and improve students' learning experience.

We suspected that poor Internet accessibility was one of the major contributors to the difficulty with remote learning at UCD, but the lack of data about the connectivity UCD students had made it difficult to know the extent of this factor in inhibiting remote learning. Curricula and syllabi are also important aspects of higher education. We hypothesized that inadequacies in syllabi created by faculty could have been another hinderance to remote education.

These concepts have been investigated before - but not in the same light. Specifically, Internet accessibility, student and faculty perceptions of online tools, and the construction of syllabi and curricula have been researched as elements of remote education. However, this research was not conducted in the context of UCD, nor was it during a time of high-stress such as the COVID-19 pandemic. Our project relied on previous efforts in determining the practices in higher education to establish a better system for students and faculty alike, but we also wanted to expand upon past research in the field of remote education to investigate the pedagogical practices concerning this sudden shift to entirely remote learning at UCD. Therefore, our project focused primarily on what we will refer to as remote learning rather than online education at UCD during the COVID-19 pandemic. Online education, unlike remote learning, refers to courses that were always meant to be taught online. Remote learning refers to courses that were intended to be taught in-person but must be taught online remotely due to other circumstances, such as a pandemic in

this case. We assessed how UCD might overcome these challenges in the short term and for the long-term benefit of the university.

We wanted to identify the major obstacles affecting remote education at UCD during the COVID-19 era as part of our project goal. We identified what these obstacles were and their root causes through the satisfaction of four research objectives listed below. Upon completing these four objectives, we came up with recommendations and designed a deliverable for UCD to aid in their journey to effective remote education. Specifically, we sought to understand the average UCD student's experience with Internet access, define the disconnect and any communication barriers that exist between faculty and students, understand why students and faculty do not utilize available tools such as Microsoft Teams, and assess how professors designed their syllabi before and during the COVID-19 pandemic. We used interviews and survey instruments with students and faculty to gather this information and to garner more personal insight into these aspects of remote learning. Our research was based on these four objectives:

1. Determine the difficulty of accessing the Internet for UCD students and its impact on remote education.
2. Determine the underlying reasons students and faculty do not utilize online resources (i.e., Microsoft Teams).
3. Characterize any differences between students' and faculty's expectations for remote course resources and communications.
4. Understand how remote education is structured at UCD and best practices around the world.

About the Project Sponsor

Chouaïb Doukkali University (UCD) located in El Jadida, Morocco is a public institution for higher education. Our sponsor is Dr. Youssef Baddi, a computer science professor in the National School of Applied Sciences at UCD.

Methodology

To answer our four major research questions, we conducted three surveys and three sets of interviews. We used the first survey to address Objective 1 and gathered data on students' Internet accessibility at UCD. We coordinated the paper distribution of this survey with our sponsor and

transferred the data into Qualtrics for analysis and compiling. Qualtrics is an online survey tool that allows you to create and distribute surveys and then analyze responses. Our second and third surveys were for Objectives 2, 3, and 4, which focused on the use of Microsoft Teams, student and faculty perceptions of remote education, and current class structures at UCD. The second survey was aimed towards students, while the third survey was aimed towards faculty. We administered Surveys 2 and 3 over Qualtrics. Our group also conducted interviews. We held the first set of three interviews with a WPI professor and experts in the field of remote education and pedagogy. Next, we interviewed six UCD students and four UCD faculty members over Google Meets. We compiled and coded all data that we gathered from those interviews using a code-as-you-go method and cleaned into common themes.

Microsoft Teams Findings

We discussed Microsoft Teams in our semi-structured interviews. Our interview with a representative from the Eaton Corporation focused entirely on Teams, since he had had a lot of experience using Teams in a professional setting. He was well-versed in the many features Teams offers. Several of our interviewees described easy mobile access, the ability to create groups, being quick to learn, and having many features on one platform as the main upsides of the Microsoft Teams platforms. On the other hand, we also found that the main downsides of the Microsoft Teams platform were that it needs a very stable Internet connection to perform well, it has almost too many features, and the interface can be confusing to use. We found that everyone we interviewed said that at this point they were relatively comfortable with using Microsoft Teams. However, students and faculty were expected to learn the platform on their own with no instructional videos or guides at the start of the pandemic. Overall, we found that Microsoft Teams was a versatile tool that UCD students and faculty have had a variety of experiences with.

Obstacles in Remote Education Findings

Most of UCD students and faculty identified students' lack of Internet connection as the main obstacle when it came to remote education. Overall, many students have to spend a significant amount of money connecting to the Internet, which is something not every student is capable of. When joining live lectures, many students will join but not pay attention due to the fact that students do not need to turn their cameras on. There are also more opportunities to cheat on

online assignments and exams, in comparison to in-person formats. Many students found that it was much easier to pay attention in a synchronous course as opposed to an asynchronous course.

Class Structure Findings

There are a variety of ways to format remote classes. Classes may be taught either synchronously or asynchronously. Synchronous classes are live lectures hosted by the professor on a video conference. In an asynchronous format, professors will record lectures and post class materials for students to view on their own time. Throughout our surveys and interviews with both UCD students and faculty, we found that many students do not have Internet that is capable of joining or staying connected to a video conference call. When we interviewed an instructional designer at WPI's Morgan Teaching & Learning Center, we found that inconsistent synchronous classes are difficult for both student and professor engagement and can be a hindrance to learning. A fully asynchronous format is better and more effective when dealing with unreliable Internet. Although asynchronous classes can be harder to pay attention in, some potential solutions include student prep quizzes before class, making shorter lectures, providing more hands-on work to increase student engagement, and being very clear about course organization and expectations.

Recommendations and Deliverables

Based on our findings, our team created a set of recommendations along with a deliverable in the form of an online instructional workshop for professors. Because of the pervasive issue of students' unstable Internet connection at UCD, as we found in both interviews and surveys, we recommended that UCD opt for a fully asynchronous format for remote classes. According to interviews with WPI professors and the Morgan Center, these asynchronous courses should be predominantly delivered through Microsoft Teams. They should include short 5–10-minute pre-recorded lecture videos sent out regularly by the professor, problem sets and worksheets, reading assignments, and active-learning video conference calls in which students can interact with their professors.

In addition to these recommendations, our team provided UCD with a short online instructional workshop for professors on how to host remote classes using Microsoft Teams. This workshop covers topics including active versus passive learning, student-based learning, learning

outcomes and assessments, course structure, usage of Microsoft Teams, classroom community, and clear online communication.

Authorship

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Introduction

The COVID-19 pandemic that began in March of 2020 changed the lives of billions of people within a matter of days. Businesses, educational institutions, social lives, and everything else we knew moved online to accommodate for the quarantine that was enforced. This sudden shift to online formats required strong Internet access at all hours of the day, especially for students. Remote learning in an online environment became the norm. Most citizens of the United States have enjoyed the privilege of the Internet for years; they can simply turn on their smartphone and send a tweet or open their laptop and begin streaming Netflix. However, Internet access is not always a given in Morocco. Getting access can be difficult there due to the high cost and lack of infrastructure. It has been especially difficult for higher education to transition to a remote format (Baddi, 2020). Since the pandemic, despite the availability of online learning tools such as Microsoft Teams, few of these tools have proven effective enough to bridge the gap at UCD (Baddi, 2020). Determining the root causes of why these technologies have been ineffective was key to understanding how to improve the quality of remote education, particularly in Morocco. Moroccan public universities specifically are vulnerable due to the lack of Internet accessibility and a fundamental disconnect between students and faculty.

Chouaïb Doukkali University (UCD) in El Jadida, Morocco has faced difficulty in teaching over an online environment amid the COVID-19 pandemic. Dr. Youssef Baddi, our sponsor and a computer science professor at UCD, reported that both students and faculty have struggled to adapt to the new online learning space due to several issues. These included a lack of widespread stable Internet connection, a lack of clear structure and course material for remote education, and prevalent hierarchical relationships between students and faculty that discourage active student engagement (Baddi, 2020). In our project, we wanted to determine the accessibility and usage of the Internet and online resources at UCD. We also aimed to bridge any potential gaps between student and faculty expectations to lessen the negative impact of the COVID-19 pandemic and improve students' learning experience as a whole. Due to the COVID-19 pandemic, we conducted all our research for this project remotely.

Many Americans have grown accustomed to a high average national bandwidth; the U.S.'s is among the highest in the world. For context, US average bandwidth is nearly thirteen times that of Morocco's average bandwidth (*Average U.S. Internet Speeds*, 2018). Dr. Baddi suspected that poor Internet accessibility was one of the major contributors to the difficulty with remote education

at UCD (Dr. Baddi). The lack of data about UCD student's Internet connectivity and other information made it difficult to know the extent of this factor in inhibiting remote learning. Curricula and syllabi are also important aspects of education. According to the sponsor, inadequacies in syllabi created by faculty could have been another hinderance to remote education. Significant scholarly work, such as research done by El Hassani, has been done on understanding student and faculty perceptions of online tools and resources, as well as curricula and syllabi development within an online environment in Morocco.

These concepts have been investigated by a previous IQP team in 2020 – their research focused on implementing project-based learning at L'École Nationale Supérieure d'Informatique et d'Analyse des Systèmes in Rabat, Morocco (J. Harnois et al, 2020). However, the connections of Internet accessibility, student and faculty perceptions of online tools, and the construction of syllabi and curricula have been researched as elements of remote education. This research was not done in the context of UCD, nor was it during a time of such high-stress as the COVID-19 pandemic. Our project relied on previous scholarship and efforts in determining the practices in higher education to establish a better system for students and faculty alike. We also wanted to expand on past research in the field of remote education to investigate the pedagogical practices concerning this sudden shift to partly remote learning and partly in-person learning at UCD. Therefore, our project focused primarily on what we will refer to as remote learning rather than online education at UCD during the COVID-19 pandemic. Online education, unlike remote learning, refers to courses that were always meant to be taught online. Remote learning refers to courses that were intended to be taught in-person but must be taught online remotely due to other circumstances, such as a pandemic in this case. We assessed how these challenges might be overcome both in the short term and for the long-term benefit of the university.

The goal of this project was to determine the major obstacles affecting remote education at UCD during the COVID-19 era to assist the university to provide a better educational model for their student body. We identified what these obstacles were and their root causes through the satisfaction of four research objectives. Upon completing these four objectives, we designed a deliverable and came up with recommendations for UCD to help with their journey to effective remote education. Specifically, we sought to understand the average UCD student's experience with Internet access, define the disconnect and communication barriers that exist between faculty and students, understand why students and faculty do not utilize available tools such as Microsoft

Teams, and assess how professors designed their syllabi before remote classes versus how they were designed during the pandemic. We used interviews and survey instruments with students and faculty to gather this information and to garner more personal insight into these aspects of remote learning.

After gathering and analyzing this data, we designed a manual of practices and approaches that will serve UCD in their desire to understand and address any shortcomings in their remote educational programs. The objectives for this project were:

1. Determine the difficulty of accessing the Internet for UCD students and its impact on remote education.
2. Determine the underlying reasons students and faculty do not utilize online resources (i.e., Microsoft Teams).
3. Characterize any differences between students' and faculty's expectations for remote course resources and communications.
4. Understand how remote education is structured at UCD and best practices around the world.

Background

Introduction

In this background, we investigated the general problem of Internet accessibility in Morocco and explored the best practices in remote learning design and implementation. To get more context on our four research objectives, we researched Internet accessibility in Morocco to determine how prevalent poor Internet access was. We also looked at research done on resources for remote education, particularly Microsoft Teams, as well as syllabi design and class structure. We explored prior research by experts in these fields, both globally and regionally, and contextualized these works as they related to our project. We concluded by introducing UCD and the background behind their struggle in transitioning to a remote educational environment.

Remote Education in Internet-Constrained Morocco

A large portion of daily life around the world moved online after the World Health Organization (WHO) declared COVID-19 a global pandemic on March 11th of 2020. By early March of 2021, the virus had infected over one hundred million people worldwide, killing over two million, and continued to spread (World Health Organization, 2021). Governments around the world responded in different ways: quarantines were announced, any non-essential businesses were shut down, and curfews were set. Every aspect of daily life had changed completely, including the way students learn. The prevalence of a deadly virus forced universities and schools to stop in-person classes, whether that meant they moved to remote delivery or simply paused. Morocco was no exception. On March 13th of 2020, all educational institutions in the country closed with no exceptions, impacting 8.9 million students (Nachit & Belhcen, 2020). Chouaïb Doukkali University (UCD), the sponsor of this project, began holding all classes remotely. Several issues had emerged and grown since then. UCD had had access to learning technologies such as Microsoft Teams, but less than half of UCD members had ever signed into their accounts (Baddi, 2020). It was unclear to Dr. Baddi what was preventing people from taking advantage of these tools designed to enable remote education. It was possible that accessibility to the Internet in Morocco was part of the problem.

According to Nachit and Belhcen (2020), 78% of professors and 65.4% of students in Morocco attribute the majority of learning obstacles to Internet network weakness. Morocco is ranked 97th out of 141 countries in ICT (information and communication technology) adoption.

Eight out of ten urban households have Internet access, compared to just one out of two rural households (Nachit & Belhcen, 2020). The Moroccan National Telecommunications Regulatory Authority (ANRT) found that Moroccan households use smartphones more than computers or laptops; 86.3% have at least one Internet-capable phone in the household versus only 60.6% with a computer (Nachit & Belhcen, 2020). Remote classes are much more doable on a computer than a phone for several reasons, which makes this statistic concerning. Computers have access to many more platforms, databases, and programs, many of which do not even have mobile versions. Features such as word processing are more difficult to do on a cell phone. Benkaraache and his colleagues conducted a survey to determine student and teacher satisfaction with remote classes in 2020 and the results were dismal (Benkaraache et al., 2020). In Morocco, 61.5% of teachers believe remote classes have not successfully replaced in-person ones, and 57% of students never want to take remote classes again (Benkaraache et al., 2020). We wanted to investigate the attitudes and user experiences of UCD students and faculty during remote learning to provide ourselves with more context for this project.

Improving Internet access would be a massive project that would require a great amount of funding, planning and knowledge of Internet connection/installation that was well outside of our expertise and the scope of this project. Internet connections are "weak" due to a low bandwidth. The Internet is essentially a large system of interconnected computer networks, and the bandwidth is the amount of data one of those computer networks can transfer in a given amount of time, measured in kilobits/second or megabits/second (Echezona & Ugwuanyi, 2010). Higher bandwidth means better connection, which allows users a better ability to upload, download, and collaborate online. To put Morocco's Internet connectivity into perspective, the average national bandwidth can be compared to that of the US. In the US, bandwidth is 93.98 megabits/second, whereas Morocco's is only 7.36 megabits/second (Average U.S. Internet Speeds, 2018). Overall, this low bandwidth prevents many public universities in Morocco, such as UCD, from using multimedia services and online learning tools (Echezona & Ugwuanyi, 2010). Our team hypothesized that this may have been one of the contributing factors to UCD's difficulty in transitioning to remote classes.

Student and Instructor Perception of Online Tools

Student satisfaction was another important factor to the project with different online resources provided by instructors through the institution. In a report posted to the International

Journal of Information and Communication Technology Education, researchers tested different types of online tools and the user satisfaction with those tools. The study consisted of both students and instructors from an online technology educational course at a public midwestern university in the United States (Keengwe et al., 2012). In this study, researchers divided the resources into four categories of tools: content management, evaluation, student informatics, and communication tools (Keengwe et al., 2012). Content management consisted of links to find resources like syllabi, announcements, and online articles; evaluation tools handled student course evaluations, online quizzes, and student assignments, student informatics covered ways for students to organize their calendars, see their assignment grades, and participate in discussion boards; and communication tools consisted of ways to private message other students or instructors to collaborate or ask direct questions. The study also found that there were two major types of resources provided in the course within these categories: textual and visual.

The researchers concluded that the students found the announcement tool most useful, followed by the grading center. The instructors rated these tools similarly. Students and faculty reports diverged, however, when considering visual versus textual resources (Keengwe et al., 2012). In the study, students reported preferring visual online reference resources while instructors believed textual resources to be more beneficial to student learning. Overall, the convenience of usage and the ability to check multiple topics at once were key factors that influenced both student/faculty satisfaction. The main conclusion of the study was that students and faculty had different opinions as to what the most useful and least useful types of resources were, and that a more satisfactory remote educational model could be formulated by assessing and bridging these gaps (Keengwe et al., 2012).

Understanding the Role of Information Literacy

Information literacy is a key factor to success in Moroccan higher education according to multimedia librarian Aziz El Hassani from Al Akhawayn University (AUI) in Ifrane, Morocco. El Hassani defines information literacy as “the ability to identify, locate, evaluate, and use information effectively” (El Hassani, 2015, pg. 33). Translating this concept to apply to UCD’s student body and faculty and their understanding of how to use Microsoft Teams was crucial in aiding the university’s transition to remote learning. In recent years, there has been an influx of new information that students and faculty alike struggle to use effectively. El Hassani identifies the issue not with finding information but knowing how to use it. In higher education, information

literacy is becoming increasingly important as electronic resources continue to expand and the Internet cements itself as a primary information source. At the time in 2015, El Hassani asserted that most Moroccan students do not have experience using the Internet past basic skills (i.e., using their email, searching on a web browser, or sharing files). Thus, they may not be able to effectively search for information or make good use of online resources provided by their universities. (El Hassani, 2015). The reality here is that most students do not come into college with the knowledge of how to use the information and resources that they have access to. Grouped with the apparent Internet access issues in Morocco and the current pandemic, information literacy becomes an even bigger problem than the one investigated by El Hassani in 2015.

El Hassani goes on to analyze the information literacy initiative at AUI, also called the 'information instruction program,' that has been teaching students to work with information available through the library's academic resources in print and online to ensure that all students are able to access and utilize these resources. One of the program's focal objectives was to "improve the ability of university students and library users to make effective use of the library resources, services, and library staff and to equip library users with the necessary skills that will enable them to better evaluate and retrieve authoritative scholarly information for their research" (El Hassani, 2015, p. 34). The program's objectives helped university and library staff to develop independent informational sessions at the library to further ensure that all students and faculty fully understand how to use the available resources. El Hassani's recommendations include building upon the strong foundation of this information literacy program by incorporating these information sessions into the curriculum (El Hassani, 2015). By incorporating the program into every class, students and faculty would no longer have to go out of their way to attend a class at the library to develop key research skills. It is important to acknowledge a large gap between El Hassani's research and ours, which is the financial differences between private and public universities in Morocco. AUI is a private university, and therefore has the budget to implement a workshop and hire staff to help digitize and organize resources at their disposal. UCD did not provide a budget for this project, as they are specifically looking to further develop an existing resource: Microsoft Teams.

Digitizing Moroccan Public Higher Education

As discussed above, Aziz El Hassani from AUI found that the problem of information literacy in Morocco mainly stems from the newness of digitized resources and information

available (El Hassani, 2015). This was an issue because even university faculty members may not fully understand how to access and use the electronic resources available to them. Public higher education in Morocco is funded by the nation-state and varies from university to university based on the class sizes at each (Slimani et al., 2014). Public universities in Morocco mobilize their own funds, which comprise approximately 40% of their budget. Their resources include, but are not limited to state subsidies, fees accrued from continuing education, incomes and benefits from research work and provisional services (expert reports), incomes and benefits of their operations and assets, repayable loans from the treasury, gifts, and legacies (Slimani et al., 2014). These resources give way to an expansion of digitizing the information and resources at hand.

A large issue in the Moroccan education system is a lack of centralization of digital information and resources. These resources range from pedagogical resources, catalogued student projects, research, administrative documents, and editorial resources kept by the university (Slimani et al., 2014). As of 2014, most of the resources at Morocco's universities were kept strictly on paper (Slimani et al., 2014). Due to the increase in digital documenting over the past few years, there has been more interest in the use of ICT. The most pressing issue is the inability to effectively centralize and archive digital resources within these institutions or disparities in referencing, such as the absence of author ID, duplication of resources, poor management of access rights or absence of standard norms of metadata record descriptions (Slimani et al., 2014). At times, students and researchers were not informed of the availability of certain documents. Centralizing online resources and ensuring that missing data is filled in creates a strong foundation for research to be conducted using the now-organized information. This centralization and organization also make it easier for students, faculty, and researchers to find the information they need.

The objective of analyzing the issue of digital inventory is to create a repository of digital resources that allows any institution of higher education and their research partners to adequately educate their staff and students about these resources. This repository or bank of digital resources would also provide a data storage platform for indexing and referencing the free resources. The three smaller goals of this bank are to allow teachers to "create a new rich pedagogical content based on previous work such as courses, exercises and examinations, experiments, etc.", provide students with a variety of courses, exercises, and answers for reference, and give researchers easy access to all research works to better manage and organize research topics (Slimani et al., 2014).

Implementing something similar at UCD is important to establishing a foundation for online resources and eliminating the confusion that makes remote learning so difficult.

Importance of Curricula and Syllabi to Education

Curricula and syllabi are important aspects of education, making them clear and comprehensive is essential for remote classes. Luke and Woods, professors in the faculty of education at Queensland University of Technology, as well as Weir, a senior lecturer at Griffith University's Gold Coast campus in Queensland, stated that the core categories included in a curriculum are skills, knowledge, behavior, competencies, and capacities (2012). Based on the specific school, faculty can include other topics they want to teach and then explain the topics in sequence. Curriculum documents, which include syllabi, curricula, and courses of study, are publicly accessible so anyone can view them. An official curriculum includes normative statements about the topics that should be learned. On the other hand, an enacted curriculum is used in everyday communication between teachers and students. When there are periods of economic and social uncertainty as well as periods of cultural conflict and change, the official curriculum is held accountable to the academic and social outcomes of schooling (Luke et al., 2012).

It has been stated that curricula and syllabi need to accomplish equity. According to Lumadi, a professor and researcher based in South Africa, an equitable curriculum must represent every person in society, specifically those that are underprivileged and disparaged (Lumadi, 2020). Lumadi reminds us that equality is an important aspect of curriculum design. While equality is making sure that every student is treated the same, equity takes other facets into consideration and makes sure that every student has the assistance they need to be successful. Equity in an educational curriculum can be a critical way to help with easing injustice in society (Lumadi, 2020).

When creating syllabi for remote courses, Vai and Sosulski, directors of remote education and innovation, stated that a syllabus should give students an idea about the teacher's expectations of their performance in the course (2015). Transitioning to remote education comes with the responsibility of updating curricula and syllabi. Both in-person classes and remote classes have similar elements on their syllabi, which according to Vai and Sosulski (2015) include: "course title, course name, course description, course objectives, evaluation plan, grading, required readings, recommended readings, and a course outline" (p. 172). The course outline should be very detailed

and include an in-depth description of how the course will operate remotely. Vai and Sosulski recommend that a remote course syllabus also include these attributes: “a communication strategy, clear description of course time frame and format, guidelines for class participation online, technical requirements and support, and a detailed course outline with start and end dates for each lesson” (p. 173). The information we found was useful to us during the project because it gave us background knowledge on the importance and proper creation of curricula and syllabi, which is something our sponsor listed as a concern in the project description. Using this information, we were better equipped to provide UCD with recommendations on how to create more effective remote courses and design syllabi.

About our Project Sponsor and University

Our sponsor was Dr. Youssef Baddi, a computer science professor in the National School of Applied Sciences at Chouaïb Doukkali University (UCD). UCD is a public, non-profit, co-educational university located in the small coastal city of El Jadida, Morocco. Figure 1 shows an image of a building on Chouaïb Doukkali University’s campus. Figure 2 is an image of El Jadida that was sent to us by the UCD student group we worked with.

Figure 1: Image of Chouaïb Doukkali University taken in 2018.

Figure 2: Image of El Jadida, Morocco sent to us by our UCD student group.

UCD is officially accredited by the Ministry of Higher Education, Scientific Research and Professional Training of Morocco, and is ranked 14th out of 37 universities in the country, and 7300th in the world (UniRank, 2020). The university's name comes from Sheikh Chouaïb Doukkali, a Moroccan scholar who advanced reformist ideas of the Nahda. The Nahda was a cultural movement that was also referred to as the "Renaissance" or "awakening" of many Arab countries (Université Chouaïb Doukkali, 2020). The Nahda took place in the 19th and early 20th century in Egypt and spread across the Arab ruled regions of the then known Ottoman Empire. The Nahda's main goal was to push Arab society towards rationalism, secularism, scientism, urbanism, and individualism (Noor, 2018). He worked as the Minister of Justice and Education and spent his time in the Middle East. King Hasan II created the university in 1989. The current president of UCD is Yahia Boughaleb. The university has grown to eight different schools including the schools of natural and human sciences, law, business, and technology. In the 2017-2018 academic year, there were 23,209 students enrolled in the school, 247 administrators, and 566 faculty. UCD has a main campus but is overall spread out with few buildings (Université Chouaïb Doukkali, 2020). UCD's main missions are to strengthen the Islamic and national identity, develop information and culture, prepare the younger generations for the real world, perform technological and scientific research, and contribute to Morocco's advancement. (Université Chouaïb Doukkali, 2020).

Conclusion

The COVID-19 pandemic exacerbated the digital gap in Morocco when it made the world move business, education, and social life online. Although Internet accessibility infrastructure in Morocco has rapidly evolved, there is still a long way to go. Universities like Chouaïb Doukkali University struggled to effectively move their classes online and communication barriers already present between faculty and students became more strained. The university provided access to online learning tools such as Microsoft Teams, but less than half of the accounts had been signed into. It was important to investigate the underlying causes, such as pre-existing social dynamics in academic settings and ease of Internet accessibility, to determine the best way to improve the quality of remote education at UCD.

Methodology

Introduction

Chouaïb Doukkali University (UCD) experienced hardships when having to move their education system from in-person to remote delivery as a result of the COVID-19 pandemic. The goal of this project was to determine the major factors affecting remote learning at UCD during the pandemic and to assist the university in providing a more successful model of remote learning to their student body. Our objectives to reach this goal were to determine the difficulty of accessing the Internet for UCD students and its impact on remote education, determine the underlying reasons students and faculty do not utilize online resources (i.e., Microsoft Teams), characterize any differences between students' and faculty's expectations for remote course resources and communications, and understand how remote education is structured at UCD and best practices around the world. We discuss these objectives and our methods for achieving them below. Although improving Internet access in Morocco was well outside the scope of this project, gaining an understanding of how much it affects students' ability to learn was important. We used qualitative and quantitative data collection tools, including semi-structured interviews and surveying, to meet our objectives. We used the same surveys and semi-structured interviews to satisfy Objectives 2, 3 and 4.

Objective 1: Determine the difficulty of accessing the Internet for UCD students and its impact on remote education.

Dr. Yousef Baddi, a computer science professor at UCD, noticed that UCD students and faculty were not effectively utilizing their online learning resources, such as their Microsoft Teams accounts. Dr. Baddi wanted to know why these resources were not being used. After our research on Internet accessibility in Morocco, we speculated that it may be due to a lack of stable Internet access. To test this hypothesis, we created and implemented a paper survey for UCD students. Throughout our project, our team was in contact over WhatsApp with a group of UCD students that was formed by Dr. Baddi to help us with various aspects of the project. We sent Survey 1 to Dr Baddi's students and our project coordinator, Ali, to distribute amongst the UCD student body. Although many surveys are administered online today, we could not require Internet access to answer a survey about Internet access. Most students who would say "no" to having stable Internet access would not have ever seen the survey if it was administered online. We obtained the most

accurate data possible by distributing paper surveys. Ali scanned the paper surveys and sent them to us so we could analyze the responses. We determined that the most efficient method of organizing our data to analyze it was to make a copy of Survey 1 in Qualtrics. One member of our team would use a completed survey to respond to Survey 1. We did this with all the completed surveys we received to get all our data into Qualtrics. After compiling all our data, we created graphs for better visualization of our findings. Data analysis for Survey 1 was straightforward, considering that fixing Internet accessibility was not within the scope of our project.

This was the first survey we sent out for several reasons. It was the fastest survey to write, so we were able to successfully send it out within the first two weeks of the term. This short survey had closed-ended questions with little risk for bias. Some of the data we collected included the relative difficulty of accessing resources like Microsoft Teams or joining a video conference call. Difficulty refers to aspects of using the Internet such as speed of downloads or loading streams of videos. We also gathered some numerical data, such as the number of devices and which devices students have. The survey was completely anonymous. A survey was the most effective method to collect this type of data. Our goal was to receive as many responses as possible to provide the most relevant data possible for the institution as a whole. The most challenging part of this survey was getting back a high enough response rate to constitute statistically relevant data. Communicating with UCD to identify the best method of distribution helped us maximize the response rate. Completing this objective ultimately provided key insight into our recommendations and deliverable to UCD.

Objective 2: Determine the underlying reasons for why students and faculty do not utilize online resources (i.e., Microsoft Teams).

To address Objective 2, two different data collection methods were used. The first method was large scale surveying. This was broken into two surveys based on the participant pools: Survey 2 (Student Remote Class Perceptions) and Survey 3 (Faculty Remote Class Perceptions). We aimed to gather quantitative data on the usage, preferences, and abilities of UCD students and faculty on the topic of remote education. We conducted these surveys through Qualtrics and surveyed a total of 65 UCD students and 14 UCD faculty. To distribute the student survey, Dr. Baddi sent the Qualtrics link to a UCD student email group with 3,000 recipients. An email group is one email address that contains the email addresses of a given number of members. Sending an email to the group address means all members of that group get the email. Our team also sent the

survey link to the UCD student group we were working with over WhatsApp. To distribute the faculty survey, Dr. Baddi sent the Qualtrics link in an email group with UCD faculty members. The second method was semi-structured interviews, broken into three types: UCD student interviews, UCD faculty interviews, and outside interviews. We aimed to gather qualitative data on similar topics as Surveys 2 and 3, now focusing on uncovering themes and trends that the group may have not originally considered when surveying. We interviewed six UCD students and four UCD faculty. For the student interviews, our group reached out to UCD students through multiple means of online communication including WhatsApp and email. For the faculty interviews, Dr. Baddi reached out to representative faculty members from different disciplines at UCD and our group directly emailed these faculty members to set up interviews. Our main sample groups for both interviews and surveys included students and faculty from three different schools at UCD: The High School of Technology, the National School of Applied Sciences, and the National School of Business and Management. We aimed to gain insights into best practices when using Microsoft Teams for business and education, hosting remote lab courses during the COVID-19 pandemic, and best practices when writing syllabi during a period of remote education during these interviews.

According to Dr. Youssef Baddi, all students and faculty at the university had access to the Microsoft Teams platform (Baddi, 2020). However, Dr Baddi noticed that this resource did not seem to be used with regularity. In the initial project statement, Dr. Baddi reported that "while 27,535 student accounts have been activated, only 13,455 are used on a regular basis" (Baddi, 2020). Similarly, only 4,667 out of 8,345 faculty accounts were reported to be used (Baddi, 2020). Because of this lack of usage of available online resources, it is important to understand why the students and faculty do not seem to be utilizing this tool to improve remote education. To understand the major factors contributing to the low usage of Microsoft Teams at UCD, we segmented the problem into two main research questions. First, do students and faculty know how to use the platform and, second, do students and faculty that use the platform find it beneficial?

Do Students and Faculty Know How to Use the Platform?

To determine whether UCD student and faculty knowledge (or lack thereof) of Microsoft Teams contributed to the underuse of the resource, we interviewed six students and four faculty members. One underlying reason that students and faculty may have not been accessing and using their Microsoft Teams account could have been due to a lack of information literacy at the

university. As discussed in the background, information literacy in the region was defined by Moroccan scholar El Hassani as “the ability to identify, locate, evaluate, and use information effectively” (2015). El Hassani identified that the issue of information literacy is not with the finding of information but knowing how to use it. Using this framing of the problem of information literacy, we sought to evaluate if this is the case at UCD. For this project, information literacy translated to a basic misunderstanding or lack of understanding of online resources. In higher education, information literacy has become increasingly important over the past decade as the availability of electronic resources continue to expand and the Internet continues to grow as a primary information source (El Hassani, 2015). During a global pandemic, this issue took on a new weight: the delivery of classes via online platforms.

According to Dr. Baddi, UCD faculty and students did not have the regular need for Microsoft Teams and digitized course information before the start of the pandemic in March of 2020 (Baddi, 2020). Because of this, most students at the university may not have had the experience or knowledge to effectively utilize Microsoft Teams. To satisfy Objective 2, we prepared our second and third surveys, which can be seen in Appendices B and C respectively. We specifically asked questions regarding the usage of Microsoft Teams. Delivered via Qualtrics, these surveys helped us to determine what role information literacy played in the lack of an effective use of Microsoft Teams at the university. Since we wanted to get a good idea of the experience at UCD as a whole, surveys were the most reasonable way to approach collecting opinions from larger groups in a timely fashion. With this research came inherent bias in questioning, answering, and expectations. Initially, we only communicated with three science-based schools at UCD, which automatically excluded a certain portion of the population. This may have misrepresented UCD student and faculty opinions as a whole. We worked with our sponsor to expand these pools of students and faculty to the entire student body via email and all of the faculty at UCD. These surveys were distributed entirely online because of the content. If students could not access the Internet in the first place, their responses would not have reflected the current state of remote education and failed to be an accurate representation of student opinions. In addition to administering surveys, we set up interviews with UCD students and faculty to get more in-depth information about their experiences. The questions asked can be seen in Appendices G and H for students and faculty respectively.

Do Students and Faculty That Use the Platform Find it Useful?

To determine whether students and faculty found the Microsoft Teams platform helpful for remote learning and teaching, we surveyed both students and faculty using Surveys 2 and 3. In a similar study done by Ahmad Ridho Rojabi (2020), researchers worked to determine Indonesian students' perceptions of Microsoft Teams as an online learning platform. In this study, Rojabi determined that two factors were important to measure when assessing an online platform such as Microsoft Teams: student interaction and learning environment (Rojabi, 2020; Gray & DiLoreto, 2016; Fortune et al., 2011). The first of these two factors, student interaction, focused more on interpersonal relations through a remote model versus an in-person model. The second factor focused more on the structure of a course (Gray & DiLoreto, 2016; Fortune et al., 2011). Rojabi (2020) stated in their study that it is important to consider both factors when assessing an online learning tool. As such, we conducted Surveys 2 and 3 for both student and faculty which included questions on both factors as relating to the use of Microsoft Teams. Through these surveys, we gained insight into the reasons why students and faculty may not have been using Microsoft Teams and represented that data quantitatively. We acknowledged the major biases that may have arisen in these surveys, specifically the small sample size and the areas of study of the students that we had access to through our sponsor. Initially, Dr. Baddi limited the scope of this project to three schools at UCD: sciences, mathematics, and technology. This may have given the students and faculty members that we surveyed an edge when it comes to understanding and using technology. As such, these surveys may not apply to UCD as a whole but gave a grounding start to better the university's remote teaching environment.

To better understand Microsoft Teams and how to facilitate effective remote learning and teaching, we interviewed a robotics professor at WPI and a Director of Workplace Productivity and collaboration from Eaton Corporation. All interview questions can be seen in Appendices E and F. Through these interviews, we hope to gain insight into the structure and usage of Microsoft Teams as well as how to run an effective remote course. After the pandemic hit in March of 2020, Eaton Corporation began using Microsoft Teams to work completely virtually. Our contact at Eaton helped the company decide which platform to use when they made the switch to online meetings and needed a space to organize files and information between project teams. His expertise and experience with Microsoft Teams specifically will help us to understand the platform better. The interview with the robotics professor from WPI helped the group better understand some

aspects of hosting a remote lab course. Hearing about more personal experiences with Microsoft Teams and teaching virtually will allow our team to better understand this situation.

Objective 3: Characterize any differences between students' and faculty's expectations for remote course resources and communications.

In addition to understanding how to use a remote education platform and the users' perceptions of that platform's usefulness, it is also important to understand how to best host remote courses if one is to build a better overall educational model. One way to work towards this goal is to understand possible differences in perceptions or opinions that students and faculty may have when it comes to remote education. In the 2012 Keengwe et al. study, researchers explored and compared student and faculty perceptions of different online resources. They concluded that bridging the gap, if any, between students' and faculty's preferences and expectations towards the usefulness of certain online resources would improve the overall educational value of a course. To understand and characterize whether there was a gap in expectations at UCD between the students and faculty, we conducted Surveys 2 and 3 and two semi-structured interviews. As seen in Appendices B and C, these interviews pertained to the perceived usefulness of different online resources such as syllabi, ability to view grades, faculty course announcements, faculty feedback on assignments, and pre-recorded lecture videos. To ensure we heard about resources we may not have thought to include in our surveys, we held semi-structured interviews to give UCD members the opportunity to discuss those possible resources that they may have found particularly useful. By doing so, we hoped to expand our knowledge and understanding of UCD student and faculty expectations. A challenge we had to be wary of when interviewing was bias. We made sure not to insert our personal beliefs and perspectives on remote education when we conducted the interviews.

Objective 4: Understand how remote education is structured at UCD and best practices around the world.

The purpose of this objective was to understand the structure of remote education at UCD and find best practices around the world. According to Dr. Baddi in the initial project description, many students were unable to find core content, such as deadlines and professor expectations, due to the inadequacy of syllabi. We created two different surveys, given to UCD students and faculty members, respectively. The questions for faculty consisted of the structure of remote classes they

taught, if syllabi were provided to students and what information was included in them, and how faculty communicated with students outside of class time. The questions for students were very similar, with wording tailored to a student perspective. For example, one question in particular that we asked faculty was, do your professors provide you with a syllabus? For students we asked the same question but with slightly different wording; do your professors provide you with a syllabus? We also held 13 semi-structured interviews: four interviews with UCD faculty, six interviews with UCD students, an interview with a WPI robotics professor, an interview with a representative at the Eaton corporation, and an interview with an instructional designer at WPI's Morgan Teaching & Learning Center. We reached out to WPI's Morgan Teaching & Learning Center to help us gain more information on syllabi design pre- and post-COVID at WPI and identify any differences between them. These interview questions can be seen in Appendix D. Since surveys did not have options for every challenge a professor faced or every change a student wanted to make, semi-structured interviews were an important mode for us to gather that information. Semi-structured interviews allowed us to get more specific information from the faculty and students because they were not halted by a small number of choices to choose from, as they may have been with surveys. Again, we were careful to avoid any bias and not interject our own thoughts and opinions on remote learning.

Overcoming Remote Research Limitations in Studying Communities with Poor Internet Access

Surveys can be a useful tool to implement in many different types of research. According to Arlene Fink, author of "How to Conduct Surveys: A Step-by-Step Guide", surveys are cost-effective, easy to access, and typically report on a person's perceptions, attitudes, and opinions (Fink, 2017). Researchers in many different fields of research, including social science, often choose surveys for their projects because of their simplicity and convenience. However, the actual design of a survey is anything but simple. The way the survey is written can have an undesired impact on the data being collected. Questions are difficult to word well; they have to avoid bias, be easily understood, and all possible answers must be anticipated. Many things that seem minor can go wrong, leading to vague, confusing, or boring questions that result in incomplete surveys and bad data. Some questions may be biased, too open-ended, or very personal; the lack of the researcher's presence could result in useless responses where people are confused or uncomfortable. Each survey needs to have at least a dozen drafts to get the optimal wording of the

questions being asked (Fink, 2017, p. 50). Overall, the goal of any survey is to get a high enough response rate to be informative and reliable.

Outside of survey content, the design and layout of the survey itself also plays a large role in the response rate. Completion of a survey is an important goal for researchers to keep in mind. If a user sees a long block of text on one page or something like “page 1 of 30”, they may click away before finishing the survey. To cut down on survey length, conditional questions can be used as necessary. For example, if a student has never used Microsoft Teams, we designed the survey to ensure they did not have to answer questions about the Microsoft Teams user experience. Designing a survey is often just the first step in many research projects. The survey instrument may be flawless, but researchers still have to consider response rates, methods of distribution, and potential errors and biases contained in the survey and its distribution. Fortunately, some aspects can be simplified. It can be difficult to get a large population to respond, but sampling allows researchers to survey a smaller group and draw conclusions based on their responses. Sampling errors like clustering and duplication must be considered when choosing a sample. Clustering happens when a single survey represents more than one member of a target population, such as two people from the same household when households as a whole are in question. Duplication occurs when a single member of the target population gets represented twice, such as someone answering a survey multiple times (Fink, 2017, p. 150). If one keeps these potential sources of error in mind, sampling can be an efficient way to cut down on time spent waiting for responses. Since a very large volume of students attend UCD, surveying all of them would have been unrealistic. Sampling allowed us to draw conclusions about the entire population without having to survey everyone. It also required less time. Getting results back faster from a smaller group of people helped move the study along.

Data Analysis

Once the data was collected, we began to start analyzing the responses from the surveys and interviews. We go into detail below about the quantitative and qualitative data analysis that we conducted.

Quantitative

Over the course of two weeks, Survey 1 was distributed on paper to a total of 109 students. After these responses were collected, we manually transferred them over from their paper copies

into a Qualtrics copy of the survey. We then compiled the responses using built-in data analysis tools on Qualtrics. This represented the data in a graphical format, better showing trends of students' responses. We used the data gathered from Survey 1 to frame questions in Surveys 2 and 3, as well as the questions for our interviews. This data also influenced our group's recommendations to UCD, after seeing the prevalence of unreliable Internet access.

We administered Surveys 2 & 3 through Qualtrics by sharing a link with our sponsor to send out to UCD students and faculty via email. Our goal for the surveys was to get a 50% response rate, but unfortunately, we did not meet this goal. When we analyzed the data, we received from the surveys, we considered greater than 50% to be a majority response. We used Qualtrics data analysis tools to transfer the data we had into graphs. Looking at the graphs would have allowed us to draw conclusions more easily after seeing trends, but the low response rates prevented any strong themes from emerging.

Qualitative

To analyze the qualitative data received from our three separate interview sets, our group implemented a step-by-step coding procedure. During all outside interview sessions, one team member handled running the session while the other team member took extensive notes on the proceedings of the interview. In addition, all outside interviews were recorded for later reference. During all UCD student and faculty interviews, a transcript of the interview was taken using Tactiq with the interviewee's permission. Tactiq is a Google Chrome extension tool that can transcribe audio during Google Meet video conferences.

Once all data was gathered from these interviews, any extraneous material was discarded (i.e., dead space or non-relevant conversation). Our team pre-determined three main categories for data coding: Microsoft Teams, the main obstacles to remote education, and class structure. As we conducted interviews, we created several subcategories for each main category. This "code-as-you-go" method was chosen over a predetermined coding for the sub-categories because our group wanted to allow themes to appear naturally based on experts', faculty's, and students' responses to include topics possibly not considered by our group initially. All questions and responses were organized into these sub-categories to answer the research questions covered by each objective. Each team member then reviewed the material from each sub-category and drew out emerging

themes. After organizing our data, it was interpreted based upon frequency of recurring themes and their pertinence to the project's main research questions.

Obstacles and Limitations

Completing a research project remotely inherently comes with its own challenges. We faced these challenges, some of which we expected and others that surprised us, when we set out to complete our project objectives. The changes in our timeline were one of our biggest obstacles. At the beginning of the term, we designed a calendar with specific dates and times for each necessary task. However, not being physically present in Morocco set us back several times, especially when it came to surveying. We had initially hoped to get Survey 1 out within the first week of the term but coordinating the distribution of hundreds of paper surveys with our sponsor proved to be more difficult than we had anticipated. We also needed to wait for Survey 1 to be translated into French. We faced a similar timing problem with Surveys 2 & 3. Although these were distributed online, it took much longer than expected to get feedback from our sponsor about the content of the surveys and their complete translations. Due to the delays in getting all three surveys out, we were limited in the total responses we could get. Had these surveys been available for a longer period, we may have gotten more responses that would have made our data a more accurate representation of the whole university.

Another unexpected challenge was the difference in cultural norms between Morocco and the United States. Prior to beginning our IQP, we did not fully comprehend just how much Moroccan and American education differed. For instance, we found there to be ingrained hierarchical relationships between students and faculty in Morocco, meaning students are sometimes uncomfortable to ask questions or give any comments to faculty. Another cultural norm we encountered was that not every faculty member provided their students with a syllabus for their course. In the United States, syllabi are typically given a lot of importance and assigned in every class.

The language barrier was another obstacle we faced during this project. When creating the surveys, we sent them to translators from the King Fahd School of Translation be translated into French per our sponsor's request. When sending out emails to set up interviews, we sent emails in both French and English. Translating these texts took longer than initially expected in the beginning of the project. When conducting our semi-structured interviews, all the faculty and half

of the students requested to have their interviews conducted in French. A translator had to be present in these interviews. The translation time factored into the total length of the interview.

Another obstacle we had to face was the time difference between the United States and Morocco. When scheduling recurring meetings with our sponsor, we had to consider the fact that Morocco is six hours ahead. We also had to take the time difference into account when scheduling interviews with the students and faculty at UCD. Since this only left the morning available for interviews, we were limited as to when we could host them. This was another time constraint after the delays previously mentioned.

Ethical Considerations and the IRB

Before we could conduct any research, we needed to be approved by WPI's Institutional Review Board (IRB). This approval process required us to fill out a form detailing or project and our methods. Along with a project summary, we submitted our methods chapter and a sample consent script for the surveys and interviews we completed. In addition to completing the application for and receiving IRB approval for our study, we completed a presentation on doing sound, ethical project work remotely along with the rest of the cohort. This presentation helped us to take a closer look at how exactly we were going to complete this research ethically. Our first step to completing ethical project research was designing anonymous surveys and conducting interviews. We also made sure to use reliable sources. As in any work, sources must be credible. When completing work that involves other people, it is important to understand how false information from unreliable sources can affect them.

In order for us to further ensure that we completed this research as ethically as possible, we needed to get as much cultural context as possible. Through weekly meetings with cultural partners (students who attend UCD), weekly discussions about different Moroccan movies, and maintaining connection with our project sponsor through meetings and WhatsApp, we hoped to compensate for completing this work from across the ocean. Additionally, we kept in contact with a group of UCD students that our sponsor put together for us. They shared images of El Jadida, participated in interviews, and responded eagerly to our messages and surveys. They even helped to distribute our first survey, which we administered on paper. Through these connections with Moroccan students and our sponsor, we filled in the gaps as best we could.

Conclusion

Like many universities, UCD faced a difficult transition to remote learning amidst the COVID-19 pandemic. However, it was unclear what obstacles were in the way of an effective remote education. We identified the major causes through interviews and surveys and used the data to design a solution accordingly. Our research was comprised of both quantitative and qualitative methods. This enabled us to explore not only the lack of access to online resources, but also perceptions, skills, and expectations with using these resources. Through this research, we were able to discover the major factors affecting remote education at UCD during the COVID-19 era to assist the university to provide a better educational model for their student body.

Findings and Analysis

Introduction

In analyzing our data from the three surveys we distributed to students and faculty at UCD and the several semi-structured interviews we conducted with both UCD students and faculty and WPI faculty, our team saw many common themes emerge in topics such as Internet accessibility in Morocco, Microsoft Teams user experience, and student and faculty experiences in remote education. Determining the biggest obstacles to successful remote learning was a primary goal of ours, and we found that nearly all UCD members attributed most of their difficulties to a lack of stable Internet connection for UCD students. Users reported a variety of experiences with Microsoft Teams, but overall, we found that Teams is a viable option for a remote learning platform. Both UCD students and faculty felt a disconnect between each other when holding classes remotely; most interviewees reported wanting to improve student-professor communication. Finally, the lack of stable Internet also had a negative impact on any synchronous class structures. We will discuss these findings in more detail below.

Internet Accessibility

We received a total of 109 responses to Survey 1, which we distributed on paper and focused on UCD student ability to access the Internet and Microsoft Teams. The first questions we asked on Survey 1 focused on devices available to UCD students, and if that device can access the Internet. We found that 86% of the respondents had access to a laptop and 77% had access to a mobile phone. However, it turned out that about half of those devices were shared with other family members. Although 91% of students could connect to the Internet, which is illustrated in Figure 3, the half that shared their devices would not always have the device in their possession.

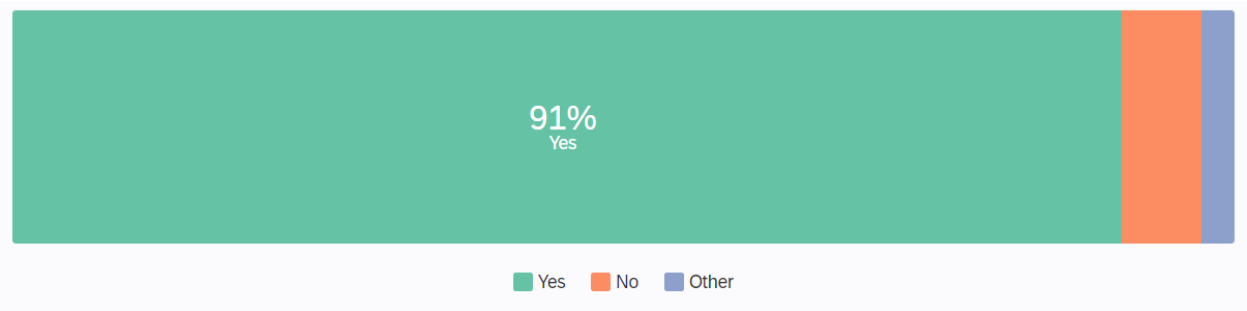

Figure 3: Responses to question, “Is that device(s) capable of accessing the Internet?”

This could be a problem for synchronous classes as students cannot join a live class if their family member needs the device at that time. Next, we asked about the experience UCD students have had when using the Internet. We found that 66% of students are either extremely unsatisfied or unsatisfied with the speed of their Internet connection, and 70% are extremely unsatisfied or unsatisfied with the stability of their connection. These statistics are illustrated in Figures 4 and 5 respectively.

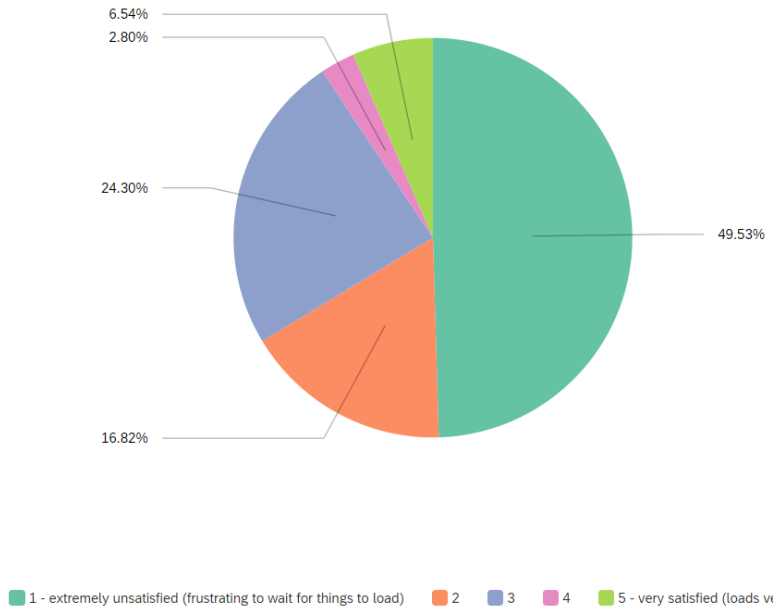

Figure 4: Responses to question, “How satisfied are you with the speed of your Internet connection?”

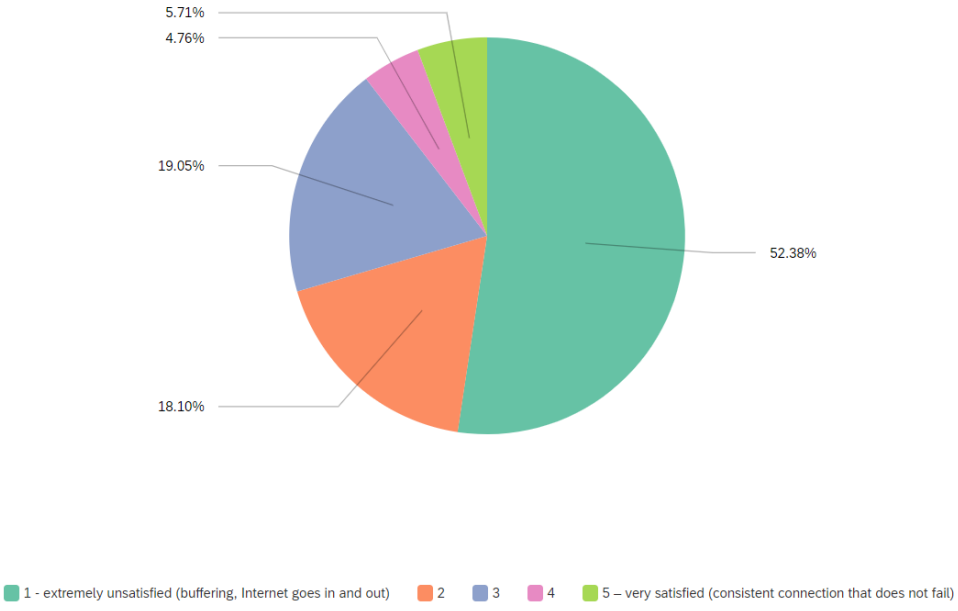

Figure 5: Responses to question, “How satisfied are you with the stability of your Internet?”

To gain a more objective understanding of how bad the connection is, we asked how often a video conference call over Microsoft Teams or Google Meet disconnects over the course of 10 minutes. An overwhelming majority (93%) reported that they lose their connection at least once or twice and this is illustrated in Figure 6.

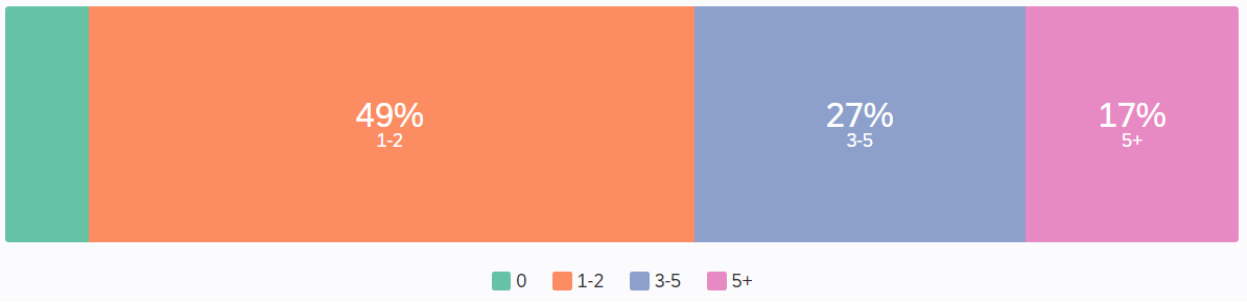

Figure 6: Responses to question, "How many times during an online video conference call is your connection broken or video lost during a 10-minute time span?"

If a call is interrupted once every 10 minutes, this is very disruptive to learning remotely in a lecture setting. Students miss important pieces of information every time they lose their connection. 55% of students cannot even join an online video call. It is impossible for these students to attend synchronous live lectures. Fortunately, remote education does not necessarily need to be held in a synchronous format. We found that 71% of respondents could load an online video within 3 minutes, which is illustrated in Figure 7. We also found that 91% could access Microsoft Teams, which is illustrated in Figure 8. This means that the majority of UCD students could at least access various learning materials.

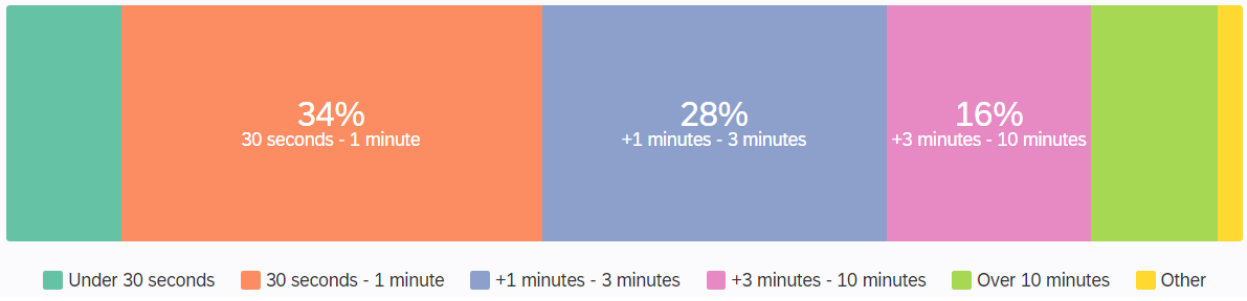

Figure 7*:* Responses to question, "When streaming an online video, how long on average does it take to load?"

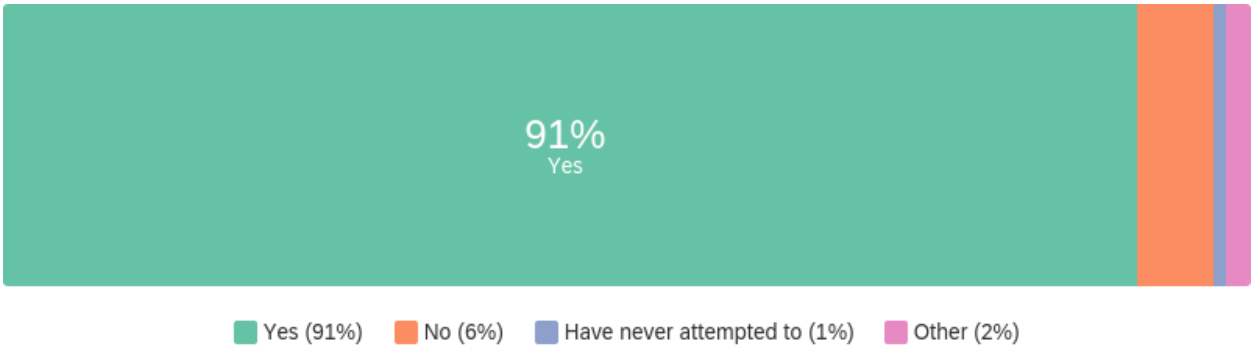

Figure 8: Responses to question, "Are you able to access Microsoft Teams?"

In all nine interviews that our team held with UCD students and faculty, the interviewees reported that student Internet accessibility was one of the biggest obstacles. Several factors play into the lack of stable Internet connection. For example, according to our interviews with UCD students and faculty, one professor mentioned that students' geographical location had a large impact on how well their Internet worked. Rural/remote areas have much poorer connection. Even if students live in more populated areas, Internet is still very expensive for most students. A UCD professor reported that each student spends about two US dollars a day on Internet access, which adds up very quickly. According to Abdelali (Ali) El-Kassas, our project coordinator, $2/day is how much the average student would spend over the course of the whole day – this would add up to $60/month, which is the average cost of Internet for Americans (Anders, 2021). $2/day would typically include a UCD student's transportation and food costs, so spending an entire day's worth of money to access the Internet can put a great deal of financial strain on students. Ali also shared that many students opt to purchase a social media "pack" for $3/month and get unlimited access to social media, but this only buys them access to social media sites such as Facebook and WhatsApp, not the internet. This is why so many UCD students and faculty members choose to communicate over WhatsApp, which is included in the unlimited social media package. This instability in Internet connection greatly impedes upon students' ability to learn. Just as in the surveys, our student interviewees said their Internet could take a long time to load and calls would often drop. Attending synchronous classes was difficult for them; constantly reconnecting to a lecture over and over was extremely distracting. The UCD professors we interviewed have stable Internet through the university but said that some students are unable to connect to their synchronous lectures. Overall, Internet accessibility has a much bigger role in successful remote

learning than our team initially expected. We used these findings to tailor our recommendations and deliverables, after seeing that a lack of Internet has been a primary obstacle for UCD students.

Microsoft Teams User Experience

At the beginning of this project, one of the things our sponsor wanted to know was why so many students and faculty members at UCD had not activated their Microsoft Teams accounts. To investigate, we discussed Microsoft Teams user experience throughout many of our interviews and included several questions about the platform on all three surveys. We interviewed Chris Chisholm, a representative from the Eaton Corporation, solely about Microsoft Teams. Chisholm has had extensive experience using Microsoft Teams in a professional setting. His company transitioned from WebEx to Microsoft Teams, and it was much faster for the employees to learn Microsoft Teams (60-90 days) than to learn WebEx (6-9 months). We learned in our UCD interviews that UCD members were expected to learn Microsoft Teams themselves at the start of the pandemic in a very short period of time. We also wanted to know what users liked and disliked about the platform. Some interviewees cited having many features in one place as a major positive of Teams. Rather than using many different apps to chat, share files, and make calls, a user can access all those features in Teams. However, others found the number of features overwhelming, stating that the user interface was confusing and there was too much to do. UCD members reported another downside to Teams: it required a very strong and stable Internet connection to join a call. Fortunately, there are many other ways to communicate on Teams. Overall, the platform has many features that can be taken advantage of to create an effective learning environment.

We also collected data about Microsoft Teams user experience in our surveys. However, our survey data is not as valuable or informative as we initially hoped it would be due to very low response rates. Of the 109 responses we received on Survey 1, we found that 91% of students were able to connect to the platform. Results from Surveys 2 & 3 (65 and 14 responses respectively) on user experiences and opinions of various Teams features were mixed, and we did not receive enough responses to see any strong emerging themes. Although this data is not statistically valid and does not have clear themes, we were still able to get some information. 54% of students reported that Microsoft Teams was the most useful resource for online classes, and 71% enjoyed having Teams be their main online learning resource.

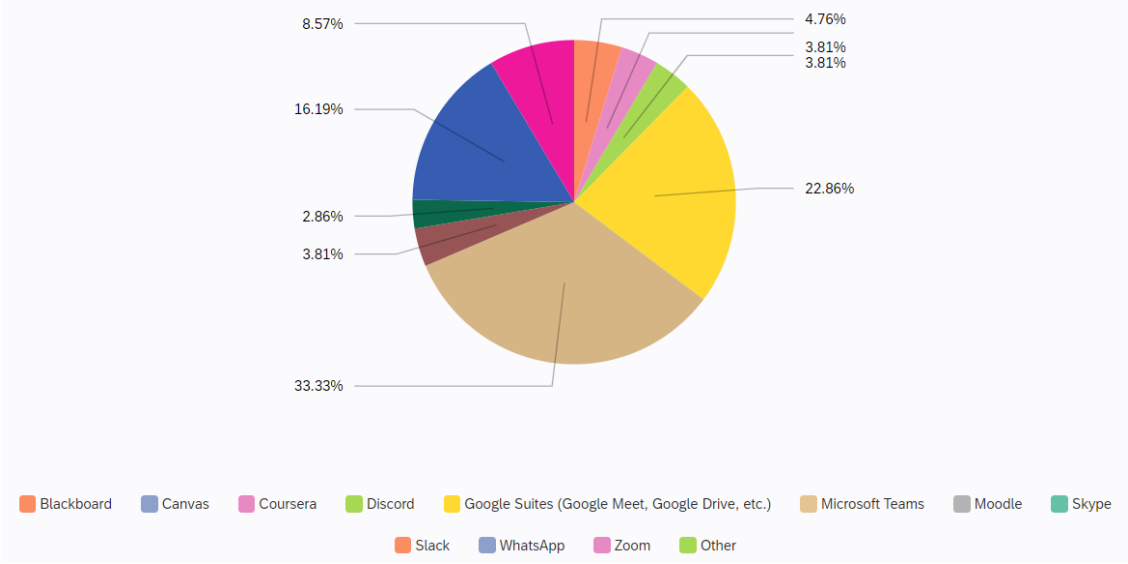

Figure 9: Responses to question, "What resources do you find most useful for online classes? Select all that apply."

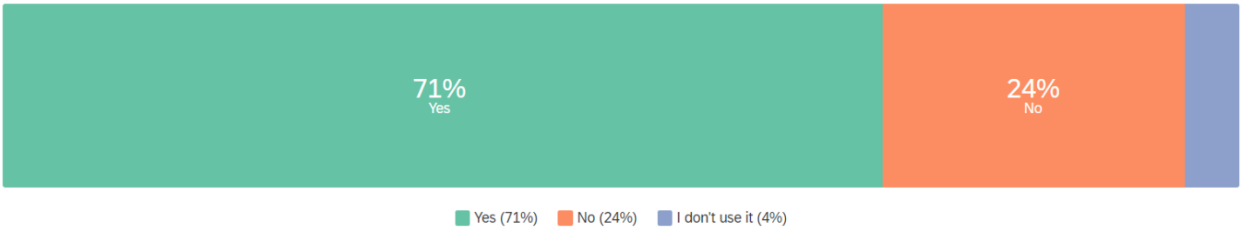

Figure 10: Responses to question, "Do you enjoy having Microsoft Teams as your main online learning resource?"

Clearly, Teams is viewed positively by the majority of UCD students who have used it. 43% of students found video conference calls to be the most useful feature on Teams. Unfortunately, 62% of students are unable to stay connected to a video call for the duration of a class.

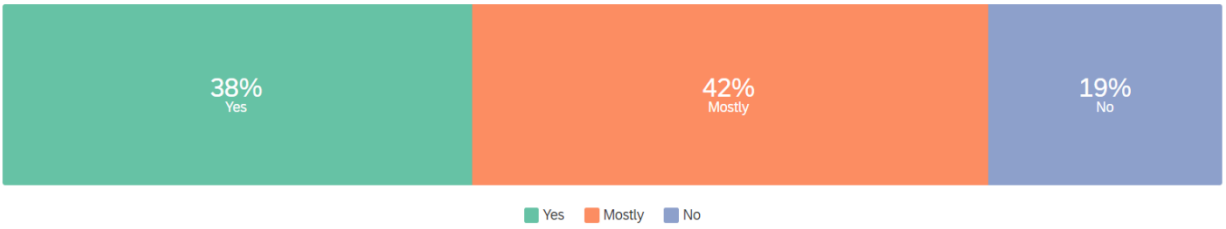

Figure 11: Responses to question, "Are you able to stay connected to the call for the duration of the class?"

56% of those students are forced to reconnect twice or more during a class. This can be very distracting for students, and they would miss lecture content while their Internet is reconnecting. This results in ineffective synchronous lectures where students are not as engaged as they could be.

Student and Faculty Remote Education Expectations

We sent out Surveys 2 and 3 over Qualtrics, which focused on student and faculty education expectations, respectively. Unfortunately, we had a very low response rate for both surveys and ultimately decided that the data collected from these surveys were not statistically relevant to our findings. The student survey was sent out to around 3,000 student group emails and we only got 65 student responses. We hypothesized that the response rate was so low due to several reasons. First, as discussed under obstacles and limitations, we faced timeline setbacks. We were not able to send out Surveys 2 and 3 as soon as we wanted, and they were only available for two weeks. While the surveys were available, we had been receiving new responses almost daily. A longer data collection period could have yielded more data. Another cause of the low response rate was the method of distribution. Since we were not physically present in Morocco, we had to coordinate distribution with our sponsor. Dr. Baddi sent out the survey links to an e-mail group with 3,000 members. However, UCD has over 20,000 students (Baddi, 2020). We needed to reach a larger pool of potential participants to get more responses. Finally, e-mails can be easily ignored. UCD students and faculty members were busy with their classes and had no incentive to take a random survey. The survey links likely got lost in other emails, went unnoticed, or got deleted.

Due to these issues, we were unable to get data that was statistically relevant to our findings. Instead, we relied on interviews to better understand student and faculty expectations. We conducted six semi-structured with students from UCD and four semi-structured interviews with faculty from UCD. Although this is just nine members of the UCD community, these interviews were more relevant than the surveys because they allowed us to get more specific insight and draw conclusions. It was difficult to draw conclusions from the surveys because we could not get such detailed answers. Professors that taught large classes were also able to share their students' general experience as well as their own, so we gained information on more than just nine people. During the student interviews, we found that three of the students wanted faculty to record live lectures so they would be able to reference the lectures again on their own time. One student said, "I prefer recording videos because you can concentrate and stop whenever you want to repeat them." These responses from students correlate with the responses from our first survey that showed 65% of students are unable to connect to a live video call but are still able to download videos. We also found that students were notified about exams about a week prior, and they felt that this did not give them ample time to study. To put that into context, in the U.S. we usually

know all exam dates from the very first day of school because it is given in the syllabus for the course. The students would have preferred more time to prepare. All six students that we interviewed thought a syllabus was important and wanted faculty to distribute one for every course. It allowed them to better understand the course objectives and schedule. However, it is important to note that students did not receive syllabi prior to the pandemic either. The number one thing students wanted was stable Internet so they could connect to live lectures without losing the connection every couple minutes.

Structure of Remote Education

During semi-structured interviews, our team found that students and faculty at UCD had a mix of synchronous and asynchronous courses. Some faculty would also give students YouTube videos to watch on their own time to further understand the course material. One professor we interviewed recorded their live lectures and then sent them out to students to review on their own time. Because of the present Internet connection issues found in Survey 1, we concluded that asynchronous courses would be more effective to address the poor Internet connection. However, many students found asynchronous classes more difficult to stay focused in because there was nothing forcing them to listen. For example, synchronous lectures that require active cameras keep students present and ready to answer questions. Since no one is watching students during asynchronous lectures, they tend to get more easily distracted and quickly lose focus. We interviewed Caitlin Keller, an instructional designer at WPI's Morgan Teaching & Learning Center, about ways to solve this problem. We learned that making lectures no longer than 10 minutes, providing more hands-on work to increase engagement, and having students complete a prep quiz before class could help.

When interviewing the faculty and students at UCD, we found that many students and faculty communicated with each other through WhatsApp, Microsoft Teams, and email outside of class. The majority of faculty said that they gave and received assignments over Microsoft Teams, email, and Google Forms. Exams were either done in-person or online. In-person exams were conducted in a typical classroom setting where the professor would watch the students individually work on their exams, while online exams were taken in various formats. Some exams would be sent over email or Microsoft Teams, and students would submit their finished exam through the same means. Other exams would be oral and conducted over a call. Many students reported finding out about an exam a week prior, which did not give them enough prep time to study for it. There

was a mixed response when it came to syllabi and group work. Faculty members provided varying degrees of a syllabus; some would create a detailed document, some would only share the course schedule and materials, and some did not provide anything at all. Only some students have participated in groupwork, much of which was in-person.

We also focused on important aspects of learning that often get overlooked in remote education during our interview with Keller; we found that a sense of community was one of them. Keller described in detail how real learning comes from students feeling connected to the professor and the course, and that a feeling of community has the largest impact on students and the quality of their education (C. Keller, personal communication, February 23, 2021). Keller described communication as a necessary aspect of community building. This means that professors need to distribute a written, accessible syllabus to help organize the remote education space and have clear communication with students. According to Keller, some important information that should be included in a syllabus are learning outcomes, a list of assessments and assignments, and logistical and organizational information. She also emphasized that there is a need to be much clearer and more up-front when conducting classes remotely. Short videos of faculty going over their syllabus as if they were going over it in a normal, in-person class would help fill in any grey areas that students have when reading the syllabus on their own. Creating short videos with recaps of the previous week or previews of the future week can be helpful for students. Keller also emphasized that the promotion of interactions with peers, group work, and projects help build community.

After receiving our Survey 1 responses, we discovered that many students at UCD had poor Internet connection that prevented them from joining synchronous classes. To address this problem, Keller gave us information on how to conduct effective asynchronous classes remotely. Setting up downloadable options, putting assignments in formats that can be accessed on multiple devices, and making sure course materials are mobile-accessible are all important for non-Internet capable accessibility. When speaking with our sponsor, he expressed concern that faculty members might be uncomfortable sharing their resources and materials. After talking to Keller, we found that pushing faculty to use resources that are already widely available, free to use, and downloadable is an effective way to help faculty teach without sharing their own intellectual property.

Conclusions, Recommendations, & Deliverable

Recommendations

Our project goal was to determine the major obstacles affecting remote education at UCD during the COVID-19 era to assist the university to provide a better educational model for their student body. The Microsoft Teams platform offers many other features besides video conferencing; students and professors can share files, post pre-recorded videos, communicate via chat, and much more. These features can be used in an asynchronous course. To increase student engagement and address problems with Internet connection, we have made the following recommendations.

1. We recommend that UCD follow an asynchronous format for remote education that increases student engagement by focusing on student-based learning.

All of the UCD students and faculty members that we interviewed cited students' unstable Internet access as the biggest obstacle to effectively learning remotely. Constantly having to reconnect to calls, as well as not being able to join at all, greatly impeded many UCD students' ability to learn. To address this problem, we recommend that UCD professors follow an asynchronous format to teach their remote classes. Nearly all students can access Microsoft Teams, and course materials can be posted to the Teams page for students to view on their own time. An asynchronous course can be hard to pay attention in, due to the fact that it's viewed on a student's own time instead of with the entire class. This means many students can get distracted easily because with asynchronous classes you do not have to turn your camera on and answer questions asked by the professor like you do in a synchronous class. To prevent students from losing interest in an asynchronous course, we recommend that professors focus on creating course materials that students can interact with beyond note-taking. Posted lecture videos should be no longer than 10 minutes, along with engaging assignments such as problem sets and group projects (C. Keller, personal communication, February 23, 2021). When students and professors are able to meet synchronously, we recommend that professors focus on answering questions and helping students directly rather than lecturing to provide more enriching interactions.

2. We recommend UCD faculty push for more a more community-based format in their classes.

Building a sense of community is important in any class, whether remote or not. Making students feel comfortable enough to ask questions and get help with material they are struggling on can be more difficult in remote classes. We recommend that UCD faculty structure their courses with a community-based learning format. A community-based learning format puts emphasis on building a community in the classroom. Establishing a culture of collaboration and interaction is a main part in accomplishing this. With a community-based learning format, both students and faculty need to follow the format for it to be useful. If both groups do not follow the format, then a sense of community will not be accomplished in the course. As mentioned above, students and professors having more back-and-forth interaction during synchronous meetings is very beneficial to student learning. However, synchronous meetings are not always an option. We recommend that UCD professors also provide an online space where students can quickly contact them to ask questions about assignments, course material, and any other issues they may be having. An application such as WhatsApp or Discord, e-mail, or messaging over Microsoft Teams have all been used by UCD and WPI professors we interviewed. Students can also answer each other's questions and make comments. This space promotes a sense of community through increased interaction in a remote setting where interaction may be very limited.

Project Deliverables

To achieve our goals of improving remote education at UCD, our group created an instructional online workshop for professors at UCD, as included in Appendix J. This workshop focuses on how to create remote classes in an effective and simple manner. We tailored this workshop for UCD's needs specifically by aiming the information covered to work well for students with unreliable Internet connection. We included 7 different modules and made the workshop in several steps. First, we wrote video scripts using material from the Morgan Learning and Teaching Center's course on remote education and our team's own findings. Secondly, we recorded these scripts in English. We sent the scripts to be translated into French while recording the visual portion. Once we received the French audio dubs, we put the dubs over the videos to create a French language option as well as the English option. We organized the videos into their respective modules and included additional reading material to support the video content. We delivered the course on Microsoft Teams to act as an example course for professors that use

Microsoft Teams. Finally, we sent this deliverable to the project sponsor for distribution amongst the UCD faculty.

We designed this training course to focus on two main ideas: how to use Microsoft Teams and how to create asynchronous courses. It includes an introduction video, a conclusion module, and seven other modules that pertain to specific topics. The first video, titled Introduction, includes a small introduction to the online training course and the topics will be covered in the other modules. The first module, titled Active versus Passive Learning, includes explanations of active and passive learning, as well as their strengths and weaknesses. It also goes over ways to implement active and passive learning in remote learning. The second module, titled Student Based Learning, includes a definition of student-based learning and how to utilize it. The third module, titled Learning Outcomes and Assessments, includes information on instructional design and course design, as well as assignments, and explains why they are important. Figure 12 shows a slide included in the third module. The slide talks specifically about aspects of course design.

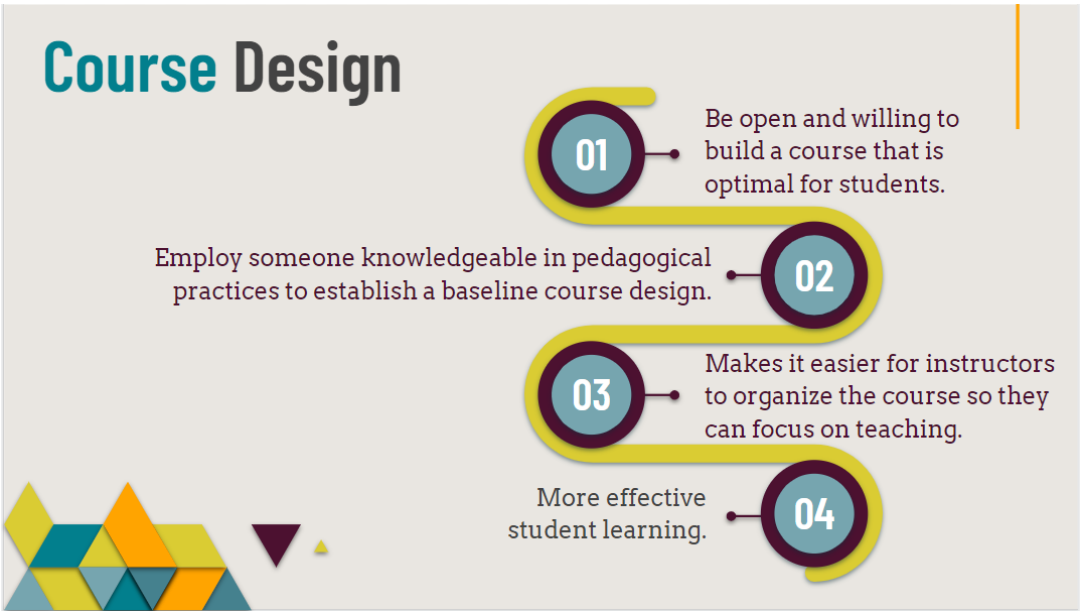

Figure 12: Screen grab of presentation slide from module three, titled "Learning Outcomes and Assessments."

The fourth module, titled Course Structure, includes information on building an asynchronous course and the key components that are needed. Figure 13 shows a slide from the fourth module. It goes into detail about the definition of a syllabus and what is important to include in one.

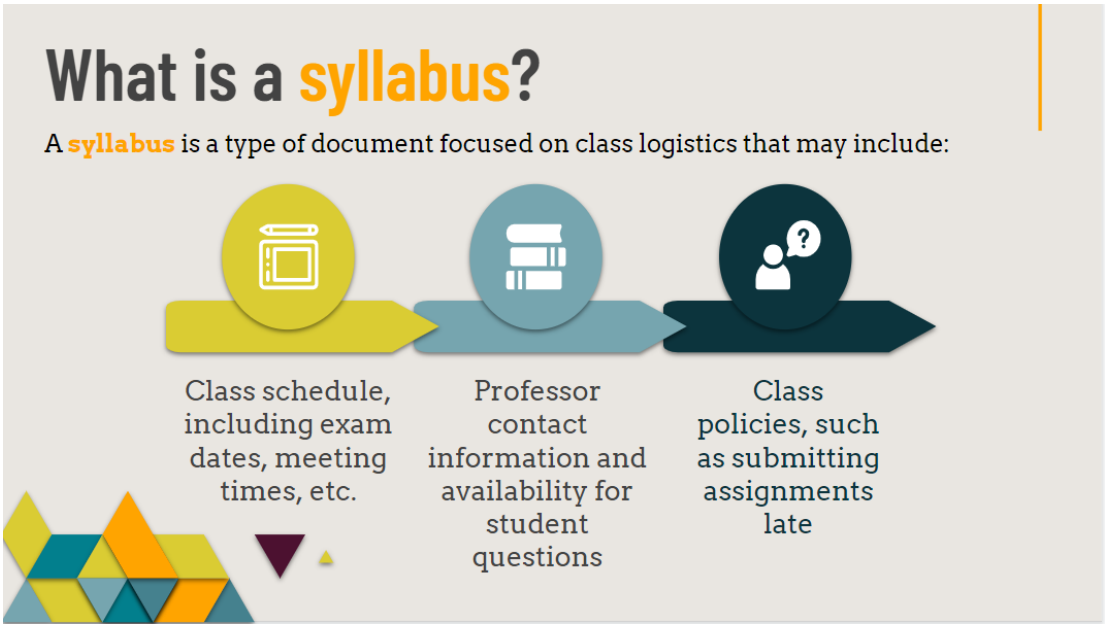

Figure 13: Screen grab of presentation slide from module four, titled "Course Structure."

The fifth module, titled Using Microsoft Teams, includes information on how to use Microsoft Teams, specifically for remote learning. The sixth module, titled Communication and Feedback, includes information on the importance of communicating and giving feedback to students as well as different types of feedback. The seventh module, titled Collaboration and Group Work, includes information on building community and the importance of collaboration and group work. The eighth and final module, titled End of Workshop, gives a quick recap on all the modules included in the training course as well as some acknowledgments. Each module includes a short video, between 3-7 minutes long, that is related to the topic. Figure XX shows a screenshot of the training course on Microsoft Teams with folders for each module. Figure XX shows a screenshot of the module 1 folder which includes the short video and links to reports and articles.

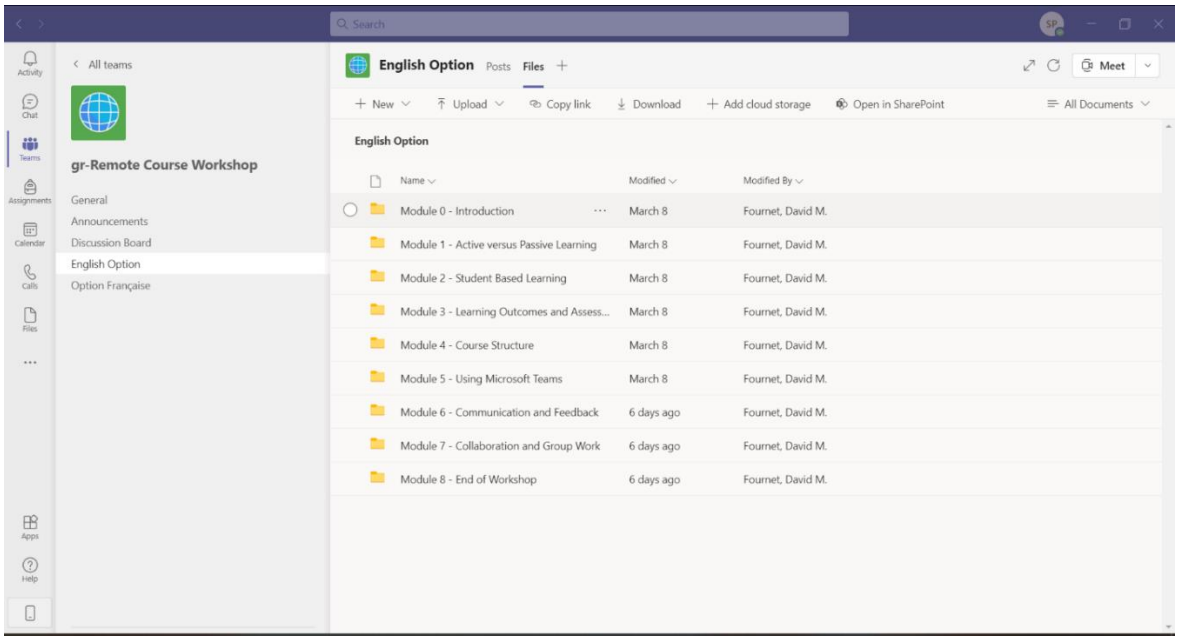

Figure 14: Screen grab of Microsoft Teams group that will be provided to UCD faculty.

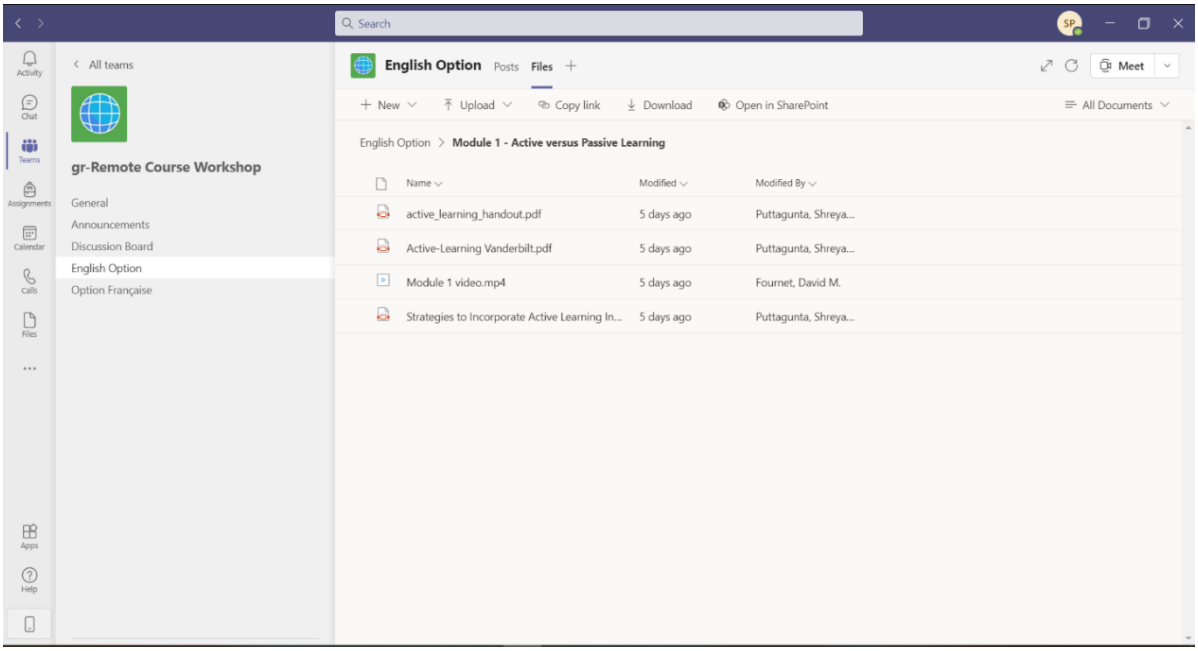

Figure 15: Screen grab of module 1 folder from the Microsoft Teams workshop.

Conclusion

We made these recommendations and deliverables to our sponsor, Chouaïb Doukkali University, to provide a more effective model for remote education based on the data we collected throughout the project. We conducted preliminary research in the first phase of our project to gain an understanding of the cultural context surrounding remote education in Morocco. Using this

research, our team devised data collection tools to determine what obstacles were preventing students from successfully learning remotely. We created three surveys and conducted a total of 13 interviews. We created Survey 1 to focus on UCD student Internet connection. We had found in our preliminary research that Internet access in Morocco is not always stable. Survey 1 was used to confirm our hypothesis that a lack of stable Internet for UCD students was a major obstacle. In Surveys 2 & 3, we focused on UCD student and professor experiences and opinions of remote education respectively. However, we did not receive sufficient responses for this data to have statistical value. Fortunately, we also held interviews with six UCD students, four UCD faculty, a professor at WPI, an instructional designer from WPI's Morgan Teaching & Learning Center, and a representative from the Eaton Corporation. Analyzing this data through coding led us to recommend that UCD focus on a community-based asynchronous learning format, along with designing and implementing a training course for professors on Microsoft Teams.

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Appendices

Appendix A.1: Student Internet Accessibility and Microsoft Teams Usage Survey - English Text

Consent Script

We are asking you to participate in a research study titled "Designing an Effective Transition to Remote Education at Chouaïb Doukkali University". We will describe this study to you and answer any of your questions. This study is being led by Elizabeth Koptsev, David Fournet, Alexandra Harrison, and Shreya Puttagunta, for a student project at Worcester Polytechnic Institute. The Faculty Advisors for this study are Rebecca Moody and Mohammed El Hamzaoui, at Worcester Polytechnic Institute.

The purpose of this research is to determine how much of the UCD undergraduate student population has stable Internet access.

We will ask you to complete a short, anonymous survey that asks you about your Internet accessibility. The survey should take no more than 10 minutes.

We do not anticipate any risks from participating in this research.

Information gained from this study may lead to an improved remote education experience at UCD in the future. We hope to learn if Internet access is one of the obstacles to an effective remote education.

There will be no compensation or credit given for this study.

Your privacy and confidentiality will be fully protected. The survey is anonymous, and we are not collecting any identifying information. Signed consent forms will be kept separate from the survey data and the two will have no connection.

Your involvement is voluntary. You may refuse to participate before the study begins, discontinue at any time, and skip any questions you are not comfortable answering.

The main researchers conducting this study are Ellie Koptsev, Shreya Puttagunta, Lexi Harrison, and David Fournet, undergraduate students at Worcester Polytechnic Institute. Please ask any questions you have now.

For more information about this research or about your rights as a research participant, may contact us at gr-ucdiqpgroup@wpi.edu or at +1 (518) 772-9746, the IRB Manager (Ruth

McKeogh, Tel. +1 (508) 831-6699, Email: irb@wpi.edu), or the Human Protection Administrator (Gabriel Johnson, Tel, +1 (508) 831-4989, Email: gjohnson@wpi.edu).
Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you. You may decide to stop participating in the research at any time without penalty.

Statement of Consent

By signing below, you acknowledge that you have been informed about and consent to being a participant in the study described above.

Your Signature _____ Date _____

Your Name (printed) _____

Signature of person obtaining consent _____ Date _____

Printed name of person obtaining consent _____

This consent form will be kept by the researcher for five years beyond the end of the study.

Survey 1 – Student Internet Accessibility and Microsoft Teams Usage Survey:

- What devices do you have, if any?
  - Smartphone
  - Laptop
  - Desktop Computer
  - Tablet
  - Other: _____
  - Not Applicable
- What devices are shared with others, if any?
  - Smartphone
  - Laptop
  - Desktop Computer
  - Tablet
  - Other: _____
  - Not applicable
- Is that device(s) capable of accessing the Internet?
  - Yes
  - No
  - Other: _____
- How satisfied are you with the speed of your Internet connection?
  - 1 - extremely unsatisfied (frustrating to wait for things to load)
  - 2
  - 3
  - 4
  - 5 - very satisfied (loads very quickly)
- How satisfied are you with the stability of your Internet?
  - 1 - extremely unsatisfied (buffering, Internet goes in and out)
  - 2
  - 3

    - 4
    - 5 - very satisfied (consistent connection that does not fail
- If you had to join an online video conference call, would your Internet connection be stable/fast enough to do so?
    - Yes
    - No
    - Other: _____
- How many times during an online video conference call is your connection broken or video lost during a 10-minute time span?
    - 0
    - 1-2
    - 3-5
    - 5+
    - Not applicable
- Is your Internet connection stable/fast enough to stream online videos reliably (meaning the video does not buffer for long periods of time, it can load within a few minutes, etc.)?
    - Yes
    - No
    - Other: _____
- When streaming an online video, how long on average does it take to load?
    - Under 30 seconds
    - 30 seconds – 1 minute
    - +1 minute – 3 minutes
    - +3 – 10 minutes
    - Over 10 minutes
    - Other: _____
- Are you able to access Microsoft Teams?
    - Yes
    - No
    - Have never attempted to
    - Other: _____
- Do any of your courses/classes use Microsoft Teams?
    - Yes
    - No
    - Other: _____
- If yes, could you please list those class(es)?
    - _____

Appendix A.2: Student Internet Accessibility and Microsoft Teams Usage Survey - French Text

Accord de consentement

Nous vous demandons de participer à une étude de recherche intitulée "Concevoir une transition efficace vers l'éducation en ligne à l'Université Chouaïb Doukkali". Nous vous présenterons cette étude et répondrons à vos questions. Cette étude est menée par Elizabeth Koptsev, David Fournet, Alexandra Harrison et Shreya Puttagunta, dans le cadre d'un projet d'étudiant à l'Institut polytechnique de Worcester. Les conseillers de la faculté pour cette étude sont Rebecca Moody et Mohammed El Hamzaoui, à l'Institut polytechnique de Worcester.

L'objectif de cette recherche est de déterminer quelle proportion de la population étudiante de premier cycle à l'UCD dispose d'un accès stable à Internet.

Nous vous demanderons de répondre à une courte enquête anonyme qui vous interrogera sur votre accessibilité à l'internet. L'enquête ne devrait pas prendre plus de 10 minutes.

Nous ne prévoyons aucun risque lié à la participation à cette recherche.

Les informations obtenues grâce à cette étude pourraient permettre d'améliorer l'expérience de l'enseignement en ligne à l'UCD à l'avenir. Nous espérons savoir si l'accès à Internet est l'un des obstacles à une éducation en ligne efficace.

Aucune compensation ou crédit ne sera accordé pour cette étude.

Votre vie privée et votre confidentialité seront complètement protégées. L'enquête est anonyme et nous ne recueillons aucune information permettant de vous identifier. Les formulaires de consentement signés seront conservés séparément des données de l'enquête et les deux n'auront aucun lien.

Votre participation est volontaire. Vous pouvez refuser de participer avant le début de l'étude, y mettre fin à tout moment et ignorer les questions auxquelles vous n'êtes pas à l'aise de répondre. Les principaux chercheurs qui mènent cette étude sont Ellie Koptsev, Shreya Puttagunta, Lexi Harrison et David Fournet, étudiants de premier cycle à l'Institut polytechnique de Worcester. N'hésitez pas à poser vos questions dès maintenant.

Pour plus d'informations sur cette recherche ou sur vos droits en tant que participant à la recherche, vous pouvez nous contacter à gr-ucdiqpgroup@wpi.edu ou au +1(518)772-9746, la responsable de l'IRB (Ruth McKeogh, tél. +1 (508) 831-6699, Courriel : irb@wpi.edu), ou l'administrateur de la protection humaine (Gabriel Johnson, Tél., +1 (508) 831-4989, Courriel : gjohnson@wpi.edu).

Votre participation à cette recherche est volontaire. Votre refus de participer n'entraînera aucune pénalité pour vous. Vous pouvez décider de cesser de participer à la recherche à tout moment sans pénalité.

Déclaration de consentement :
Signature_____ Date_____
Nom et Prénom (imprimés)_____
Signature de la personne qui obtient le consentement _____
Nom et prénom imprimés _____
Ce formulaire de consentement sera conservé par le chercheur pendant cinq ans après la fin de l'étude.

Sondage 1 - Sondage sur l'accessibilité des étudiants à l'Internet et l'utilisation des Microsoft Teams :

- Quels sont les appareils dont vous disposez, s'il y en a?
  - Smart phone
  - Ordinateur portable
  - Ordinateur de bureau
  - Tablette
  - Autres: _____
  - Aucune réponse
- Quels sont les appareils partagés avec les autres, s'il y en a?
  - Smart phone
  - Ordinateur portable
  - Ordinateur de bureau
  - Tablette
  - Autres:_____
  - Aucune réponse
- Cet/Ces appareil(s) est-il/sont-ils capable(s) d'accéder à l'Internet?
  - Oui
  - Non
  - Autres:_____
- A quel point êtes-vous satisfait de la vitesse de votre connexion Internet?
  - 1 - extrêmement insatisfait (frustrant d'attendre un chargement)
  - 2
  - 3
  - 4
  - 5 - très satisfait (chargement rapide)
- A quel point êtes-vous satisfait de la stabilité de votre connexion Internet?
  - 1 - extrêmement insatisfait (chargement lent, coupure d'Internet)
  - 2
  - 3

    - 4
    - 5 - très satisfait (connexion constante qui n’échoue pas)
- Si vous deviez vous joindre à une vidéoconférence en ligne, votre connexion Internet serait-elle assez stable/rapide pour le faire?
    - Oui
    - Non
    - Autres:_____
- Au cours d'une vidéoconférence en ligne, combien de fois votre connexion s'interrompt ou l’image se coupe pendant une période de 10 minutes?
    - 0
    - 1 - 2
    - 3 - 5
    - 5+
    - Aucune réponse
- Votre connexion Internet est-elle suffisamment stable/rapide pour diffuser des vidéos en ligne de manière fiable (c'est-à-dire que la vidéo ne se charge pas pendant de longues périodes, qu'elle peut se charger en quelques minutes, etc.)
    - Oui
    - Non
    - Autres:_____
- Lors de la diffusion d'une vidéo en ligne, combien de temps faut-il en moyenne pour qu’elle se charge?
    - Moins de 30 secondes
    - 30 seconds - 1 minute
    - +1 seconds - 3 minutes
    - +3 seconds - 10 minutes
    - Plus de 10 minutes
    - Autres:_____
- Pouvez-vous accéder à Microsoft Teams?
    - Oui
    - Non
    - N'ont jamais essayé
    - Autres:_____
- Certains de vos cours/classes utilisent-ils Microsoft Teams ?
    - Oui
    - Non
    - Autres:_____
- Si oui, pouvez-vous nommer le(s) professeur(s) ?
  _____

Appendix B: Student Remote Class Perceptions Survey – English Text

Consent Script

As part of a collaborative project between Worcester Polytechnic Institute and Prof. Youssef Baddi, we invite you to participate in a research study titled "Students' Perceptions of Distance Learning." We will describe this study to you and answer any of your questions. This study is being led by Elizabeth Koptsev, David Fournet, Alexandra Harrison, and Shreya Puttagunta, for a student project at Worcester Polytechnic Institute. The Faculty Advisors for this study are Rebecca Moody and Mohammed El Hamzaoui, at Worcester Polytechnic Institute.

The purpose of this research is to gain an understanding of student attitudes and perceptions of remote education based on experience.

We will ask you to complete a short, anonymous survey that asks you about your experience with remote classes. The survey should take no more than 10 minutes.

We do not anticipate any risks from participating in this research.

Information gained from this study may lead to an improved online education experience at UCD in the future. We hope to understand UCD student experiences with remote education.

There will be no compensation or credit given for this study.

Your privacy and confidentiality will be fully protected. The survey is anonymous, and we are not collecting any identifying information. Signed consent forms will be kept separate from the survey data and the two will have no connection.

Your involvement is voluntary. You may refuse to participate before the study begins, discontinue at any time, and skip any questions you are not comfortable answering.

The main researchers conducting this study are Ellie Koptsev, Shreya Puttagunta, Lexi Harrison, and David Fournet, undergraduate students at Worcester Polytechnic Institute. Please ask any questions you have now.
For more information about this research or about your rights as a research participant, may contact us at gr-ucdiqpgroup@wpi.edu or at +1 (518) 772-9746, the IRB Manager (Ruth McKeogh, Tel. +1 (508) 831-6699, Email: irb@wpi.edu), or the Human Protection Administrator (Gabriel Johnson, Tel, +1 (508) 831-4989, Email: gjohnson@wpi.edu).

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you. You may decide to stop participating in the research at any time without penalty.

By checking "I consent", you acknowledge that you have been informed about and consent to being a participant in the study described above.

Survey 2 – Student Remote Class Perceptions
Please answer the following questions in the context of online education at UCD.

- What websites or programs have you used before in your UCD courses? Select all that apply.
    - Blackboard
    - Canvas
    - Coursera
    - Discord
    - Google Suites (Google Meet, Google Drive, etc.)
    - Microsoft Teams
    - Moodle
    - Skype
    - Slack
    - WhatsApp
    - Zoom
    - Other: _____
- What resources do you find most useful for online classes? Select all that apply.
    - Blackboard
    - Canvas
    - Coursera
    - Discord
    - Google Suites (Google Meet, Google Drive, etc.)
    - Microsoft Teams
    - Moodle
    - Skype
    - Slack
    - WhatsApp
    - Zoom
- What resources do you find least useful? Select all that apply.
    - Blackboard
    - Canvas
    - Coursera
    - Discord
    - Google Suites (Google Meet, Google Drive, etc.)
    - Microsoft Teams
    - Moodle
    - Skype
    - Slack
    - WhatsApp
    - Zoom
- What resources are provided for courses besides Microsoft Teams, if any?
    - Blackboard
    - Canvas
    - Coursera
    - Discord

    - Google Suites (Google Meet, Google Drive, etc.)
    - Moodle
    - Skype
    - Slack
    - WhatsApp
    - Zoom
    - None
- Do you enjoy having Microsoft Teams as your main online learning resource?
    - Yes
    - No
    - I don't use it
- Have you activated your Microsoft Teams account?
    - Yes
    - No
- If you have not activated your Microsoft Teams account, how are you attending/taking classes? Select all that apply.
    - Google Meet
    - Skype
    - Zoom
    - Other: _____
- How regularly do you use your Microsoft Teams account? Select one.
    - Never
    - Every class period
    - Once a month
    - Multiple times a month
    - Once a week
    - Multiple times a week
    - Once a day
    - Multiple times a day
- Are your classes delivered over Microsoft Teams?
    - Yes
    - Some of them
    - No
    - Other: _____
- If your classes are not delivered on Microsoft Teams, how do you attend classes?
    - Google Meet
    - Skype
    - Zoom
    - Other: _____
- On a scale from 1-5, how comfortable are you with the Microsoft Teams platform?
    - 1 (extremely comfortable)
    - 2 (somewhat comfortable)
    - 3 (neither comfortable nor uncomfortable)

    - 4 (extremely uncomfortable)
    - 5 (extremely uncomfortable)
- When using Microsoft Teams to participate in an online course, which of the following features do you find the most useful? Select 3.
    - Calendar
    - Scheduling Assistant
    - Video Conference Tool
    - Calling
    - Group Discussion
    - Private Chat
    - Channels
    - File Sharing
    - Activity Tool
    - Assignments Tool
    - Other: _____
- When using Microsoft Teams to participate in an online course, which of the following features do you find the least useful? Select up to 3.
    - Calendar
    - Scheduling Assistant
    - Video Conference Tool
    - Calling
    - Group Discussion
    - Private Chat
    - Channels
    - File Sharing
    - Activity Tool
    - Assignments Tool
    - Other: _____
- When using Microsoft Teams to participate in an online course, do you feel your instructor uses Microsoft Teams effectively?
    - Yes
    - No
    - Sometimes
    - Other: _____
- Do your professors use Microsoft Teams to communicate with you? (assign homework, assign projects, announce test dates, etc.)
    - Yes
    - No
    - Sometimes
- If not through Microsoft Teams, how do your professors communicate with you? Select all that apply.
    - Email
    - WhatsApp

    - Slack
    - Other: _____
- Are your classes synchronous, asynchronous, or a mix of both? (Synchronous: students have lectures at a specific time each week. Asynchronous: students view recorded lectures each week at any time they choose.)
    - Synchronous
    - Asynchronous
    - Mix of both
    - Other: _____
- How do your synchronous classes meet? Select all that apply.
    - Microsoft Teams video call
    - Zoom video call
    - Google Meet call
    - Other: _____
- Are you able to stay connected to the call for the duration of class?
    - Yes
    - Mostly
    - No
- If you are not able to stay connected, how often do you have to rejoin the call within a class period?
    - 0
    - 1
    - 2
    - 3-5
    - 5+
- Are you able to ask questions during the call?
    - Yes
    - No
    - Other:_____
- How do you ask questions in class? Select all that apply.
    - In the chat
    - Unmute and ask
    - Email the professor after class
    - I don't feel comfortable asking questions in class
    - Other: _____
- Are your live class sessions recorded?
    - Yes
    - No
    - I don't know
- If your classes are recorded, how often do you reference previous lectures?
    - Never
    - Rarely
    - Once or twice

    - Sometimes
    - Frequently
- Do you prefer asynchronous or synchronous courses?
    - Asynchronous
    - Synchronous
    - No preference
    - I have only tried one or the other
- Do your professors provide you with a syllabus? A syllabus is a document that serves to outline the basic elements of a course including what topics will be covered, a weekly schedule, and a list of tests, assignments, and their associated weightings.
    - Yes
    - No
    - I don't know
    - Other: _____
- If provided by your instructor, do you use/reference syllabi or other course resources?
    - Yes
    - Depends on the course
    - No
- What parts of a syllabus are most useful to you?
    - Instructor contact information (name, office number, email, etc.)
    - Basic course information (course section, meeting times, room number, etc.)
    - Course goals and objectives
    - Required literature (textbooks, articles, websites, etc.)
    - Course schedule
    - Grading criteria
    - Course policies
    - Other: _____
- Do your professors send class-wide announcements?
    - Yes
    - No
    - I don't know
- If your professors send class-wide announcements, what platform do they use to send announcements?
    - Microsoft Teams
    - Email
    - WhatsApp
    - Other: _____
- How often do they send class-wide announcements?
    - Daily
    - 2-4 times per week
    - Once a week
    - Every two weeks
    - Every month

    - Never
- How do you communicate with your professors between classes?
    - Email
    - Chats in Microsoft Teams
    - WhatsApp or another messaging app
    - I do not communicate with my professors between classes
    - Other: _____
- How do your professors assign homework or projects?
    - Email
    - Posts on Microsoft Teams
    - Posts on another platform
    - WhatsApp or text messages
    - Assign during class
    - Other: _____
- Do your professors provide a schedule of assignments for the course? (either on a website, in an email, in a syllabus, or another type of document)
    - Yes
    - No
    - I don't know
- How do you receive feedback on your assignments/grades?
    - Comments on the document
    - Feedback in an email
    - Feedback in a chat on Microsoft Teams
    - I do not receive feedback on assignments
    - Other: _____
- Do you have any teaching assistants? (older students who help run your class/grade assignments or tests)
    - Yes
    - No
    - I don't know
- Which of the following resources have been helpful in any online class you have had since the start of the pandemic?
    - Class-wide Announcements
    - Ability to view grades in real time
    - Course Feedback
    - Discussion Boards
    - Group Text Messaging
    - Class Calendar
    - Ability to view assignments
    - Private Messaging
    - Other: _____
- Did you have any of this information or these resources available before the pandemic?
    - Yes

    - Some of them
    - None of them
    - Other: _____

- Do any of your courses require a lab class?
    - Yes
    - No
- Do your professors use Microsoft Teams to organize your lab courses?
    - Yes
    - Sometimes
    - No
    - Other:_____
- If not Microsoft Teams, what do your professors use?
    - Google Meet
    - WhatsApp
    - Skype
    - Zoom
    - Other: _____
- Do you have daily or weekly meetings for your lab courses?
    - Yes
    - Sometimes
    - No
    - Other:_____
- Are your lessons recorded?
    - Yes
    - No
    - I don’t know
- Do any of your lab courses require group projects?
    - Yes
    - No
- How do you split up into teams during class to work on group projects?
    - Breakout rooms
    - Separate meetings altogether
    - We do not split up into teams during class
- Do you meet with your team outside of class time?
    - Yes
    - No
    - Other: _____

Appendix C: Faculty Remote Class Perceptions Survey – English Text

Consent Script

We are asking you to participate in a research study titled “Faculty Remote Class Perceptions”. We will describe this study to you and answer any of your questions. This study is being led by Elizabeth Koptsev, David Fournet, Alexandra Harrison, and Shreya Puttagunta, for a student project at Worcester Polytechnic Institute. The Faculty Advisors for this study are Rebecca Moody and Mohammed El Hamzaoui, at Worcester Polytechnic Institute.
The purpose of this research is to gain an understanding of faculty attitudes and perceptions of remote education based on experience.

We will ask you to complete a short, anonymous survey that asks you about your experience with remote classes. The survey should take no more than 10 minutes.

We do not anticipate any risks from participating in this research.

Information gained from this study may lead to an improved online education experience at UCD in the future. We hope to understand UCD faculty experiences with remote education.

There will be no compensation or credit given for this study.

Your privacy and confidentiality will be fully protected. The survey is anonymous, and we are not collecting any identifying information. Signed consent forms will be kept separate from the survey data and the two will have no connection.

Your involvement is voluntary. You may refuse to participate before the study begins, discontinue at any time, and skip any questions you are not comfortable answering.

The main researchers conducting this study are Ellie Koptsev, Shreya Puttagunta, Lexi Harrison, and David Fournet, undergraduate students at Worcester Polytechnic Institute. Please ask any questions you have now.

For more information about this research or about your rights as a research participant, may contact us at gr-ucdiqpgroup@wpi.edu or at +1 (518) 772-9746, the IRB Manager (Ruth McKeogh, Tel. +1 (508) 831-6699, Email: irb@wpi.edu), or the Human Protection Administrator (Gabriel Johnson, Tel, +1 (508) 831-4989, Email: gjohnson@wpi.edu).

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you. You may decide to stop participating in the research at any time without penalty.

By checking "I consent", you acknowledge that you have been informed about and consent to being a participant in the study described above.

Survey 3 – Faculty Remote Class Perceptions

Please answer the following questions in the context of online education at UCD.

- Do your students engage in remote online classes?
    - Yes
    - No
    - N/A
    - Other: _____
- What websites or programs have you used before in your UCD courses? Select all that apply.
    - Blackboard
    - Canvas
    - Coursera
    - Discord
    - Google Suites (Google Meet, Google Drive, etc.)
    - Microsoft Teams
    - Moodle
    - Skype
    - Slack
    - WhatsApp
    - Zoom
    - Other: _____
- What resources do you find most useful for online classes? Select all that apply.
    - Blackboard
    - Canvas
    - Coursera
    - Discord
    - Google Suites (Google Meet, Google Drive, etc.)
    - Microsoft Teams
    - Moodle
    - Skype
    - Slack
    - WhatsApp
    - Zoom
- Which resources do you find least useful for online classes? Select all that apply
    - Blackboard
    - Canvas
    - Coursera
    - Discord
    - Google Suites (Google Meet, Google Drive, etc.)
    - Microsoft Teams
    - Moodle
    - Skype

    - Slack
    - WhatsApp
    - Zoom
- Do you enjoy having Microsoft Teams as your main online teaching resource?
    - Yes
    - No
    - I don't use it
- What resources are provided by UCD besides Microsoft Teams, if any?
    - Blackboard
    - Canvas
    - Coursera
    - Discord
    - Google Suites (Google Meet, Google Drive, etc.)
    - Moodle
    - Skype
    - Slack
    - WhatsApp
    - Zoom
    - None

- Have you activated your Microsoft Teams account?
    - Yes
    - No

- If you have not activated your Microsoft Teams account, how are you teaching classes? Select all that apply.
    - Google Meet
    - Skype
    - Zoom
    - Other: _____

- How regularly do you use your Microsoft Teams account? Select one.
    - Not at all
    - Once per class
    - Once a month
    - Multiple times per month
    - Once per week
    - Multiple times per week
    - Once per day
    - Multiple times a day

- Do you deliver courses over Microsoft Teams?
    - Yes
    - Some of them
    - No
    - Other: _____
- If you don't deliver courses over Microsoft Teams, how do you teach your classes?
    - Google Meet
    - Skype
    - Zoom
    - Other: _____
- On a scale of 1-5, how comfortable are you with the Microsoft Teams platform?
    - 1 (extremely uncomfortable)
    - 2 (somewhat uncomfortable)
    - 3 (neither uncomfortable nor comfortable)
    - 4 (somewhat comfortable
    - 5 (extremely comfortable)
- When using Microsoft Teams to teach an online course, which of the following features do you find the most useful? Select 3.
    - Calendar
    - Scheduling Assistant
    - Video Conference Tool
    - Calling
    - Group Discussion
    - Private Chat
    - Channels
    - File Sharing
    - Activity Tool
    - Assignments Tool
    - Other: _____
- When using Microsoft Teams to teach an online course, which of the following features do you find the least useful? Select up to 3.
    - Calendar
    - Scheduling Assistant
    - Video Conference Tool
    - Calling
    - Group Discussion
    - Private Chat
    - Channels
    - File Sharing
    - Activity Tool
    - Assignments Tool
    - Other: _____

- When using Microsoft Teams to teach an online course, do you feel that it is an effective platform?
    - Yes
    - No
    - Sometimes
    - Other: _____
- Do your students use Microsoft Teams to communicate with you? (turn in homework, turn in projects, chat with you, etc.)
    - Yes
    - No
    - Sometimes
- If not through Microsoft Teams, how do your students communicate with you? Select all that apply.
    - Email
    - WhatsApp
    - Slack
    - Other: _____

- Are your classes synchronous, asynchronous, or a mix of both? (Synchronous meaning students have lectures at a specific time each week and asynchronous meaning students view recorded lectures each week at any time they choose.)
    - Synchronous
    - Asynchronous
    - Mix of both
    - Other: _____
- How do your synchronous classes meet? Select all that apply.
    - Microsoft Teams video call
    - Zoom video call
    - Google Meet call
    - Other: _____
- Are you able to stay connected to the call for the duration of the class?
    - Yes
    - Mostly
    - No
- If you are not able to stay connected, how often do you have to rejoin the call within a class period?
    - 0
    - 1
    - 2
    - 3-5
    - 5+
- Are your students able to ask questions during the call?

    - Yes
    - No
    - Other:_____
- How do your students ask questions in class? Select all that apply.
    - In the chat
    - Unmute and ask
    - Email you after class
    - Students rarely choose/never choose to ask questions
    - Other: _____
- Do you record your live class sessions?
    - Yes
    - No
    - I don't know
- If you record your classes, do you share those class recordings with students?
    - Yes
    - No
- Do you prefer asynchronous or synchronous courses?
    - Asynchronous
    - Synchronous
    - No preference
    - I have only tried one or the other
- Do you provide your students with a syllabus? (A syllabus is a document that serves to outline the basic elements of a course including what topics will be covered, a weekly schedule, and a list of tests, assignments, and their associated weightings.)
    - Yes
    - No
    - Other: _____
- What parts of a syllabus do you find most useful?
    - Basic course information (course section, meeting times, room number, etc.)
    - Course goals and objectives
    - Required literature (textbooks, articles, websites, etc.)
    - Course schedule
    - Grading criteria
    - Course policies
    - Other: _____
- Do you send class-wide announcements?
    - Yes
    - No
    - Other: _____
- If you do send class-wide announcements to your students, what platform do you use to send announcements? Select all that apply.
    - Microsoft Teams
    - Email

    - WhatsApp
    - Other: _____
- How often do you send class-wide announcements?
    - Daily
    - 2-4 times per week
    - Once a week
    - Every two weeks
    - Every month
    - Never
- How do you communicate with your students between classes?
    - Email
    - Chats in Microsoft Teams
    - WhatsApp or another messaging app
    - I do not communicate with my students between classes
    - Other: _____
- How do you assign homework or projects?
    - Email
    - Posts on Microsoft Teams
    - Posts on another platform
    - WhatsApp or text messages
    - Assign during class
    - Other: _____
- Do you provide a schedule of assignments for the course? (either on a website, in an email, in a syllabus, or another type of document)
    - Yes
    - No
    - Other:_____
- How do you provide feedback on your assignments/grades?
    - Comments on the document
    - Feedback in an email
    - Feedback in a chat on Microsoft Teams
    - I do not provide feedback on assignments
    - Other:_____
- Do you have any teaching assistants? (older students who help run your class/grade assignments or tests)
    - Yes
    - No
    - I don't know
    - Other: _____
- Which of the following resources have been helpful in any online class you have hosted since the start of the pandemic? Select all that apply.
    - Class-wide Announcements
    - Ability to view grades in real time

    - Course Feedback
    - Discussion Boards
    - Group Text Messaging
    - Class Calendar
    - Ability to view assignments
    - Private Messaging
    - Other: _____
- Did you use any of this information or these resources before the pandemic?
    - Yes
    - Some of them
    - None of them
    - Other: _____
- Do any of your courses require a laboratory component?
    - Yes
    - No
- Do you use Microsoft Teams to organize your lab courses?
    - Yes
    - Sometimes
    - No
    - Other: _____
- If not Microsoft Teams, what do you use?
    - Google Meet
    - WhatsApp
    - Skype
    - Zoom
    - Other: _____
- Do you have daily or weekly meetings for your lab courses?
    - Yes
    - Sometimes
    - No
    - Other: _____
- Do you record your lessons?
    - Yes
    - No
    - Other: _____
- Do any of your lab courses require group projects?
    - Yes
    - No
- How do you split up your students into teams during class to work on group projects?
    - Breakout rooms
    - Separate meetings altogether
    - They do not split up into teams during class

Appendix D: Morgan Learning Center Representative Interview Questions

Syllabi / Hosting Remote Education

1. What is your position at the learning center and what is your role in aiding with teaching faculty about remote education?
2. What did you go over in the professor training over the summer and how long was the training?
3. Did you give certain aspects more importance in the training?
4. Have you ever received any pushback from faculty that you were instructing and if so how did you deal with it?
5. What do you find to be the hardest part of transitioning to remote education and how was it overcome?
6. Do you think a syllabus is an important resource for a student to have in their course? If so, what aspects would you consider most important to include on a syllabus for a remote course?
7. Given that students at UCD are reporting poor internet, do you have any recommendations for better hosting fully asynchronous classes online?
8. Through your own work, have you found any trends regarding creating successful asynchronously based courses?
9. One of our group's objectives is to provide UCD with a brief online workshop for faculty members on hosting remote courses. What, if anything, would you deem most important to include in such a workshop especially considering that students may have poor internet connection and that faculty may be uncomfortable sharing course material?

Class Engagement

1. How do you encourage class participation over Zoom? What works well? What doesn't?
2. What is the hardest part of teaching remotely as opposed to a classroom? The biggest obstacles?
3. Have you found any benefits to teaching remotely?
4. Generally speaking, do you feel that student performance has gotten worse since transitioning to remote learning?
5. What do you wish you could tell your past self in March 2020?
6. What have been the most useful tools for you since teaching remotely? I.e platforms like MT, teaching assistants, scheduling tools like online calendars/when2meet, etc.
7. If you were unable to hold synchronous classes, how would you teach asynchronously?
8. What do you think is the most important thing a teacher should do when teaching remotely?

Appendix E: Eaton Representative Interview Questions

1. What is your role at Eaton?
2. Had you used Microsoft Teams before the pandemic? (I know that my mom works with some people from India and Germany, so how did teams with International members meet before the pandemic?)
    a. If yes, did you have to make any changes to how you used Teams from before?
3. What do you use MT for?
4. Was there anything specific about Teams that made you choose the platform over other options?
5. Is there anything specific that you really like about MT?
6. What would you change about MT? Are there any important features you think are missing?
7. What are some of the most useful features of Microsoft Teams? What are some of the least useful?
8. What are some challenges you've faced when using Teams?
9. Were there any challenges unique to international employees?
10. Have you encountered any problems while using MT?
11. What would you recommend to anyone starting out with Microsoft Teams?
12. Did you have any issues with people not wanting to use Microsoft Teams?

Appendix F: WPI Robotics Professor Interview Questions

1. What is your position at the learning center and what is your role in aiding with teaching faculty about remote education?
2. What did you go over in the professor training over the summer and how long was the training?
3. Did you give certain aspects more importance in the training?
4. Have you ever received any pushback from faculty that you were instructing and if so how did you deal with it?
5. What do you find to be the hardest part of transitioning to remote education and how was it overcome?
6. Do you think a syllabus is an important resource for a student to have in their course? If so, what aspects would you consider most important to include on a syllabus for a remote course?
7. Given that students at UCD are reporting poor internet, do you have any recommendations for better hosting fully asynchronous classes online?
8. Through your own work, have you found any trends regarding creating successful asynchronously based courses?
9. One of our group's objectives is to provide UCD with a brief online workshop for faculty members on hosting remote courses. What, if anything, would you deem most important to include in such a workshop especially considering that students may have poor internet connection and that faculty may be uncomfortable sharing course material?
10. UCD faculty members are uncomfortable with sharing materials; how can we get around that?
11. Any last comments or suggestions?

Appendix G: UCD Student Interview Questions

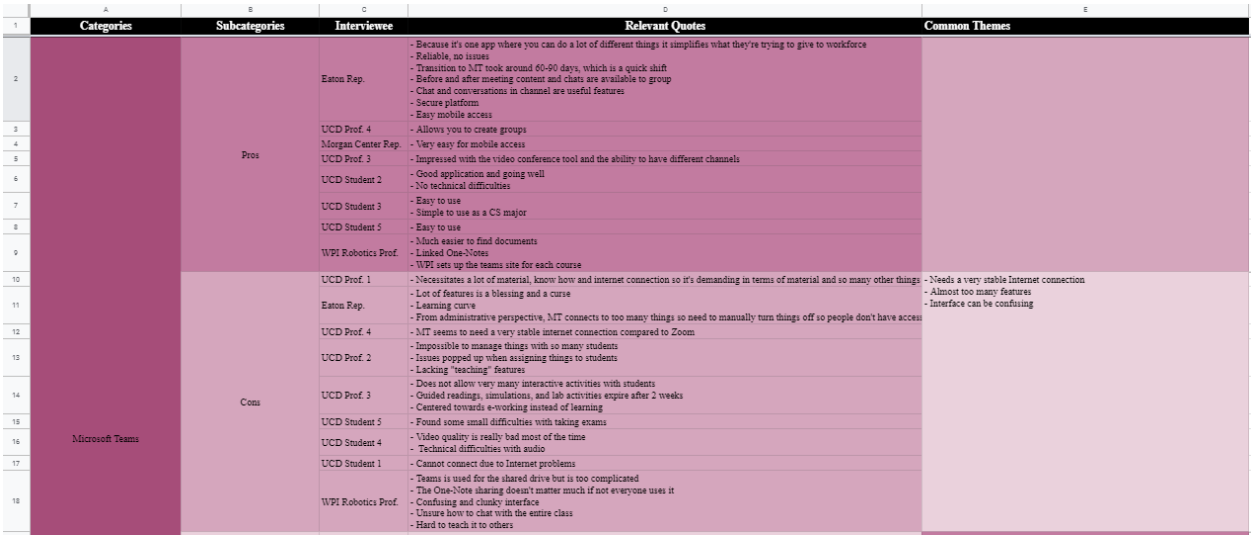
1. Have you activated your Microsoft Teams account and if so, what do you use it for and do you like it?
2. Do you feel comfortable using the Microsoft Teams platform and would an instructional video on how to use it for remote education be useful?
3. What would you say is the biggest obstacle/problem you have faced with remote education?
4. How have your classes been organized since the start of the pandemic?
    a. Are they synchronous vs asynchronous?
    b. What is the format of your exams?
    c. How do you get your assignments, and how do you submit them?
5. Do you get a syllabus for any of your courses? If so, what is included on it?
6. How do you communicate with your professor?
7. Do you feel that your performance in school has been negatively affected by the COVID-19 pandemic?
8. IF LAB STUDENT, what does a lab class look like at UCD and what has been the biggest obstacle created by the pandemic for the lab classes you attend?

Appendix H: UCD Faculty Interview Questions

1. Have you activated your Microsoft Teams account and if so, what do you use it for and do you like it?
2. Do you feel comfortable using the Microsoft Teams platform and would an instructional video on how to use it for remote education be useful?
3. How do you organize your classes since the start of the pandemic?
    a. Are they synchronous vs asynchronous?
    b. What is the exam format?
    c. How are assignments given and submitted?
4. What would you say is the biggest obstacle/problem you have faced with remote education?
5. Do you provide a syllabus to students for your course? If so, what is included on it?
6. What are some difficulties you have faced when creating a syllabus for a course and what are some ways you have addressed those difficulties?
7. How do you communicate with your students?
8. Do you feel that your students' performance in school has been negatively affected by the COVID-19 pandemic?
9. How many students begin your class and how many students stay through to the end?
10. IF LAB INSTRUCTOR, what does a lab class look like at UCD and what has been the biggest obstacle created by the pandemic for lab classes?

Appendix I: Interviews Codebook Details

To better understand the information that we gained through interviews, we created a codebook in Google Sheets that we filled out and structured as we went. We split the data into three main categories: Microsoft Teams (pictured below in blue), Main Obstacles in Remote Education (pictured below in green), and Class Structure (pictured below in purple). Each of these categories had their own set of subcategories: Microsoft Teams had Pros, Cons, Comfort with Usage, and Other, Main Obstacles in Remote Education had Internet Accessibility, Cheating, Not Paying Attention, and Other, and Class Structure had Synchronous vs. Asynchronous, Student-Professor Communication, Lab Courses, Assignments, Exams, Syllabi, and other. For each interview, two of our team members were present – one to conduct the interview and the other to take notes. When coding, we switched so that the two team members who were not at the interview would go through the responses and code the information to make it more easily understandable. Below are snapshots of our codebook.



	A	B	C	D	E
1	**Categories**	**Subcategories**	**Interviewee**	**Relevant Quotes**	**Common Themes**
2	Microsoft Teams	Pros	Eaton Rep.	- Because it's one app where you can do a lot of different things it simplifies what they're trying to give to workforce - Reliable, no issues - Transition to MT took around 60-90 days, which is a quick shift - Before and after meeting content and chats are available to group - Chat and conversations in channel are useful features - Secure platform - Easy mobile access	
3			UCD Prof. 4	- Allows you to create groups	
4			Morgan Center Rep.	- Very easy for mobile access	
5			UCD Prof. 3	- Impressed with the video conference tool and the ability to have different channels	
6			UCD Student 2	- Good application and going well - No technical difficulties	
7			UCD Student 3	- Easy to use - Simple to use as a CS major	
8			UCD Student 5	- Easy to use	
9			WPI Robotics Prof.	- Much easier to find documents - Linked One-Notes - WPI sets up the teams site for each course	
10		Cons	UCD Prof. 1	- Necessitates a lot of material, know how and internet connection so it's demanding in terms of material and so many other things	- Needs a very stable Internet connection - Almost too many features - Interface can be confusing
11			Eaton Rep.	- Lot of features is a blessing and a curse - Learning curve - From administrative perspective, MT connects to too many things so need to manually turn things off so people don't have access	
12			UCD Prof. 4	- MT seems to need a very stable internet connection compared to Zoom	
13			UCD Prof. 2	- Impossible to manage things with so many students - Issues popped up when assigning things to students - Lacking "teaching" features	
14			UCD Prof. 3	- Does not allow very many interactive activities with students - Guided readings, simulations, and lab activities expire after 2 weeks - Centered towards e-working instead of learning	
15			UCD Student 5	- Found some small difficulties with taking exams	
16			UCD Student 4	- Video quality is really bad most of the time - Technical difficulties with audio	
17			UCD Student 1	- Cannot connect due to Internet problems	
18			WPI Robotics Prof.	- Teams is used for the shared drive but is too complicated - The One-Note sharing doesn't matter much if not everyone uses it - Confusing and clunky interface - Unsure how to chat with the entire class - Hard to teach it to others	

	A	B	C	D	E
1	**Categories**	**Subcategories**	**Interviewee**	**Relevant Quotes**	**Common Themes**
19		Comfort with usage	UCD Prof. 1	- Comfortable with usage	- Comfortable w usage
20			UCD Prof. 2	- Challenging to use as a professor	
21			UCD Prof. 3	- Comfortable with usage	
22			UCD Student 6	- Uncomfortable at first - Never taught how to use the platform, had to figure it out themselves	
23			UCD Student 3	- Comfortable with platform	
24			UCD Student 5	- Comfortable with platform	
25			UCD Student 1	- Comfortable w usage - An instructional video would be useful for students to learn MT - Using it less now that in-person is happening again	
26			UCD Prof. 4	- Comfortable with usage	
27		Other	UCD Prof. 1	- Does not think instructional video is needed for faculty - When they don't understand something with MT, colleagues and friends usually help them figure it out	- Students and faculty were both expected to just learn it on their own - Some find it easy to learn
28			UCD Prof. 3	- Shared instructional videos with other professors	
29			UCD Student 6	- Instructional video would be helpful	
30			UCD Student 3	- Video may have been helpful, but is a CS student so didn't have much trouble	
31			UCD Student 5	- Homework, exams, and other classroom activities hosted over MT - Students required to activate their accounts	
32			UCD Student 2	- Video would be helpful, both students and professors would use it - There isn't a problem, but more instruction in online tools would be beneficial	
33			UCD Student 1	- Students were just expected to figure it out themselves	
34			UCD Prof. 4	- Learned how to use MT on their own without an instructional video and found it easy to learn	
35	Main Obstacles in Remote Education	Internet accessibility	UCD Prof. 1	- Internet connection is main problem - For faculty wifi and internet connection is not a big problem - Student's facing problems connecting with each other and accessing things	- Students' lack of internet connection is the main problem - Students have to spend a lot of money connecting to Internet
36			UCD Prof. 2	- Poor internet connection in a main obstacle	
37			UCD Student 2	- Technical difficulties with lack of internet connection is a big obstacle	
38			UCD Student 4	- Very difficult to understand others with bad connection	
39			UCD Student 3	- Network connection difficult	
40			UCD Student 5	- Difficulties with internet connection	
41			UCD Student 6	- Internet connection is the biggest issue	
42			UCD Student 1	- Internet connection is the biggest problem	
43			UCD Prof. 3	- Internet connection of students is the biggest obstacle to remote education	
44			UCD Prof. 4	- Internet connection is biggest problem - Internet is not stable	
45		Cheating	UCD Prof. 1	- Students may be online but cheating	- Online exams allow for more cheating opportunities
46		Not paying attention	UCD Prof. 1	- Sometimes you can see that the student is online but they're not really attending ,we just test them, we ask questions if they are th	- Students sometimes join lectures but are not actually present and watching - Easier to pay attention in a synchronous course
47			UCD Prof. 2	- No guarantee that student is paying attention or even on the call	
48			UCD Prof. 3	- Wants to keep students engaged and motivated but it is difficult	
49			WPI Robotics Prof.	- Easier to pay attention in synchronous courses	

	A	B	C	D	E
1	**Categories**	**Subcategories**	**Interviewee**	**Relevant Quotes**	**Common Themes**
50		Other	UCD Prof. 1	- Students would spend almost two dollars a day to, for a day class, which is really expensive for a regular student - Distribution of students across the country; some parts have very poor connection	
51			UCD Prof. 2	- Lack of interaction is another main obstacle - Can't tell if students understand the material	
52			UCD Prof. 3	- Small classes (20-30) students typically stay but if it is a large class (50-60) then sometimes they only end with 10-15 students	
53			UCD Student 2	- Not a lot of interaction between students and professors is another main obstacle - More video calls with professors/class would be helpful	
54			UCD Student 3	- Difficult to be motivated when you wake up early and complete classes in your bedroom - Quarantine is draining and makes students lazy	
55			UCD Student 5	- Psychological issues with not being able to interact with or see others	
56			UCD Student 1	- Sometimes masks can make it difficult to understand professors	
57			Morgan Center Rep.	- Everyone started in a different place, all faculty were at varying levels of understanding online resources - Very big difference between online learning and emergency remote education	
58		Synchronous vs asynchronous	UCD Prof. 1	- Regular live synchronous classes	- Hybrid is the worst option. Going fully online is better. - Asynchronous can be more effective for those with poor internet connection - Asynchronous courses can be harder to pay attention in. Some solutions may be: - have students do a prep quiz before class - make shorter lectures and provide more hands-on work to increase engagement - be very clear about course organization and schedule
59			UCD Prof. 2	- Held mainly synchronous classes over MT - Recorded lectures on MT so students could watch them after	
60			UCD Prof. 3	- Does synchronous when students are able to connect, otherwise posts pre-recorded lectures	
61			UCD Prof. 4	- Conduct synchronous classes - Gives youtube videos for students to reference since not all of them can join	
62			Morgan Center Rep.	- Because of poor internet connection among UCD students, university might want to up downloadable content in formats accessit - Microsoft Teams specifically is great for accessing content on mobile devices - Asynchronous courses lack in community, students feel disconnected - Short videos for weekly recaps, include a few social aspects (group work, etc.), promote interactions with peers, and be very (ove	
63			UCD Student 2	- Depending on professor have synchronous and asynchronous classes - Likes asynchronous because likes to be able to pause and focus on lecture - Synchronous classes allows for more interaction between students and professor	
64			UCD Student 5	- Had only synchronous classes - No recording and would stop lectures immediately if someone attempted to record	
65			UCD Student 6	- Some professors held classes on Zoom, some provided recorded lecures, some only provided written information to study - Not all professors provided lectures - No central plan - professors did what they wanted	
66			UCD Student 4	- Have synchronous courses - Watched youtube videos on own time to understand course material	
67			UCD Student 3	- All classes were live - Did not have to activate cameras	
68			UCD Student 1	- Joined calls on MT for remote classes - Some classes are in-person again - Does not think there is a big difference between remote and in-person	
69			WPI Robotics Prof.	- Hybrid is difficult to do during synchronous lectures, but better during synch. labs - Initially wanted to do asynchronous lectures and use synchronous classes to review homework - If forced to be asynch., students could do a prep quiz before the class	

	A	B	C	D	E
1	**Categories**	**Subcategories**	**Interviewee**	**Relevant Quotes**	**Common Themes**
70		Student-professor communication	UCD Prof. 1	- Communicate all week - I send an email informing the students of the task they have to do or to prepare them for what we will be seeing and covering - Post announcements on MT for students - Mainly use MT and then also WhatsApp and email	- Morocco: Whatsapp and e-mail is primary channel of communication - It is more difficult to help students over Zoom/similar platforms - Building a sense of community is key for learning
71			UCD Prof. 2	- During course uses microphone to communicate - Tells students to take notes and save questions until the end or write them in the chat - Outside of class they use WhatsApp and sometimes MT	
72			UCD Prof. 3	- E-mail, sometimes MT, never WhatsApp	
73			UCD Prof. 4	- Communicates with students through WhatsApp outside of class	
74			Morgan Center Rep.	- Building community has the largest impact on learning and often overlooked, real learning comes from when students feel conne - Older faculty have a harder time connecting with students over the internet	
75			UCD Student 2	- Communicate with professor through email	
76			UCD Student 4	- Usually only communicates with TA - If contact with professor is needed, they can email the professor	
77			UCD Student 6	- Communicated with professors over email	
78			UCD Student 5	- Professors prefer communication strictly from the delegate - But sometimes can email directly - Students use email, WhatsApp, and FB messenger to communicate with delegate	
79			UCD Student 3	- Every class had a WhatsApp chat - Communicated via WhatsApp group or over email	
80			UCD Student 1	- WhatsApp and E-mail - Phone call	
81			WPI Robotics Prof.	- Difficult to help students on Zoom - Uses Zoom for familiarity - Discord is good for student-student communication, short-term help	
82		Lab Courses	UCD Prof. 2	- Lab classes require exercises and assignments using the computer, and many students encounter issues and don't know how to pr - It is the professor's job to coach students through, and a physical presence is crucial to this task	
83			UCD Prof. 3	- Make small videos of the labs and put those videos on youtube for students to watch - Students not having access to the materials tended to be the largest obstacle, especially if the labs couldn't be done through simul	
84			UCD Student 4	- Lab is done on PC and sent to the professor for feedback	
85			UCD Student 3	- Web design labs - In-person activity rooms to complete projects with a group - Communicate with group members via WhatsApp	
86			WPI Robotics Prof.	- 15 minute intro, then breakout rooms for student teams - Difficult to get materials to students - Some labs are impossible to do remotely - Mistakes w hardware cause days long setbacks bc of troubleshooting,waiting for delivery of new parts - How can students prove they successfully completed a project? Look at code and calibration, etc. Online videos make it difficult	

	A	B	C	D	E
1	**Categories**	**Subcategories**	**Interviewee**	**Relevant Quotes**	**Common Themes**
87		Assignments	UCD Prof. 2	- Students were provided pdf's and other materials through MT	
88			UCD Prof. 3	- Given over e-mail or MT - Students submit over MT, email if they cannot access MT - Has never used WhatsApp to assign things unlike many other professors	
89			UCD Prof. 4	- Assignments given and submitted over MT	
90			UCD Student 6	- Assigned and submitted everything through MT	
91			UCD Student 3	- Communicated with TA to submit assignments to them or directly to the professor	
92			UCD Student 5	- Used assignments tool in MT	
93			UCD Student 2	- Professor send link for assignment on whatsapp or MT and students send back on whatsapp or MT	
94			UCD Student 4	- Assignments given on WhatsApp	
95			UCD Student 1	- Receive assignment over MT, submit over e-mail or Google forms	
96		Exams	UCD Prof. 1	3 ways to administer exams: 1. Individual online interviews where the student has to give answers to the professor in face to face conversations 2. Multiple choice questions, sent to prof through microsoft platform 3. Final project/capstone - sent to professor over platform	- Online exams in various formats - Sometimes not a lot of prep time
97			UCD Prof. 2	- Send questions over gmail and students send back answers over gmail - Oral exams were done on a call	
98			UCD Prof. 3	- Held online exams during pandemic, now all are in-person	
99			UCD Student 2	- Have online and in-person exams	
100			UCD Student 5	- Administered via MT	
101			UCD Student 6	- In-person exams only	
102			UCD Student 3	- Exams were online	
103			UCD Student 4	- professor gives out many different versions of the exam, after an hour they email it back	
104			UCD Student 1	- Online exams - Found out about exam week prior to it	
105		Syllabi	UCD Prof. 1	- Usually give syllabus to students and provide them with all the material they need - Students know the chapters they will be studying in advance - They have practical exercises that are separated by lectures - At the very beginning they will know what are the chapters that they will be studying and in each class they will be covering 25%	- Syllabi are important for organizing an online space - Some professors do provide and some don't; very mixed - Including a short video reviewing syllabus content would be helpful
106			UCD Prof. 2	- In the beginning, an introductory document explaining expectations, professor contact information, and necessary material	
107			UCD Student 2	- No formal syllabus given - Sometimes given an introductory document that includes a list of topics the course will cover	
108			UCD Student 4	- TA talks to the professor and gets info, they pass it along to students, but not in document format - Told course times, course schedule, what happens in case of cancellation, etc	
109			UCD Student 6	- Received syllabus from only one professor - Provided with course information, exam information, what will be expected of students, other details - Given professor's emails	
110			UCD Student 1	- Professors sent something about how the class would be organized - Found out about exams about one week prior to the exam - WhatsApp groups	

	A	B	C	D	E
1	**Categories**	**Subcategories**	**Interviewee**	**Relevant Quotes**	**Common Themes**
110		Syllabi	UCD Student 1	- Professors sent something about how the class would be organized - Found out about exams about one week prior to the exam - WhatsApp groups	
111			UCD Student 5	- No paper syllabus	
112			UCD Prof. 3	- Provides syllabus - Course outline, whether it will be lecture or practical, etc - Treats syllabus same as they would in-person	
113			UCD Student 3	- Sometimes get a syllabus - Each class has its own group and sometimes teacher posts what will be going on in the next class and what will be studied	
114			UCD Prof. 4	- Does not provide students with a syllabus - Provided them with slides throughout all the virtual lectures, and gave a series of assignments in advance	
115			Morgan Center Rep.	- Important to try to build community through communication and a written, accessible syllabus helps organizing the online space - Show learning outcomes, what assessments will be used, and logistical and oranizational information - Including short video going over the syllabus to fill in any gray areas	
116		Other	UCD Student 6	- In-person classes started, professors stopped providing information and materials online - If info was provided online, it was just PPTs, not recorded lectures from in-person meetings - Most classes did not finish studying all the material that was planned	
117			UCD Student 3	- Make classes more interactive, ask questions to make sure students are paying attention - Some teachers assume students are following along when they aren't	
118			UCD Student 5	- Delegate in the class that studies with you (equivalent of a TA) - Connects with the teacher and acts as a liasion between them and students	
119			UCD Student 2	- Had groups to discuss course material over Discord, WhatsApp - Groups of about 10 - Get problems and work outside of class on them - Submit individually.	
120			UCD Student 4	- Have group projects - used Zoom, Google Meet, WhatsApp to organize groups	
121			WPI Robotics Prof.	- Breakout rooms during labs over Zoom	

Appendix J: Compiled Deliverable

Microsoft Teams training course link:

https://teams.microsoft.com/l/team/19%3ae52c9de2a7ab41a79522c86ac7605f4f%40thread.tacv2/conversations?groupId=18bca274-cba3-4d94-aade-613145ca5012&tenantId=589c76f5-ca15-41f9-884b-55ec15a0672a

Module 0: Introduction to the Course

Video Script:

Hello and welcome to "Designing an Effective Online Remote Course." My name is David Fournet and I will be the primary instructor during this instructional workshop. This workshop was made as part of a collaborative project between Worcester Polytechnic Institute and Chouaïb Doukkali University. In this course we are going to cover different topics about how to best host an online course using Microsoft Teams and other supporting applications. Here we can see the different topics that we will cover during this course. All supporting materials for the course will be available on the course's Microsoft Teams page and all topic videos will be no longer than ten minutes. This course will be fully asynchronous so that you may take it on your own schedule and will be open to anyone who would like to better their students' educational experience in the online environment. We recommend watching the course in its entirety, even if you feel that you already know some of the information covered. Thank you for taking the workshop and we hope you enjoy it and find it useful.

Module 1: Active vs. Passive Learning

Video Script:

Welcome to module one of this instructional workshop. In this module we will be covering what the differences are between active and passive learning, and how this can be used to create a more engaging course for your students.

First, let us define what active and passive learning are. Active Learning includes any approach where students are asked to engage in the learning process. This can include, but is not limited to, problem sets, discussions, group projects, and more. Passive learning includes any approach that requires students to absorb instructional content without interaction. This can include, but is not limited to, watching lectures, assigned readings, slide presentations, and more.

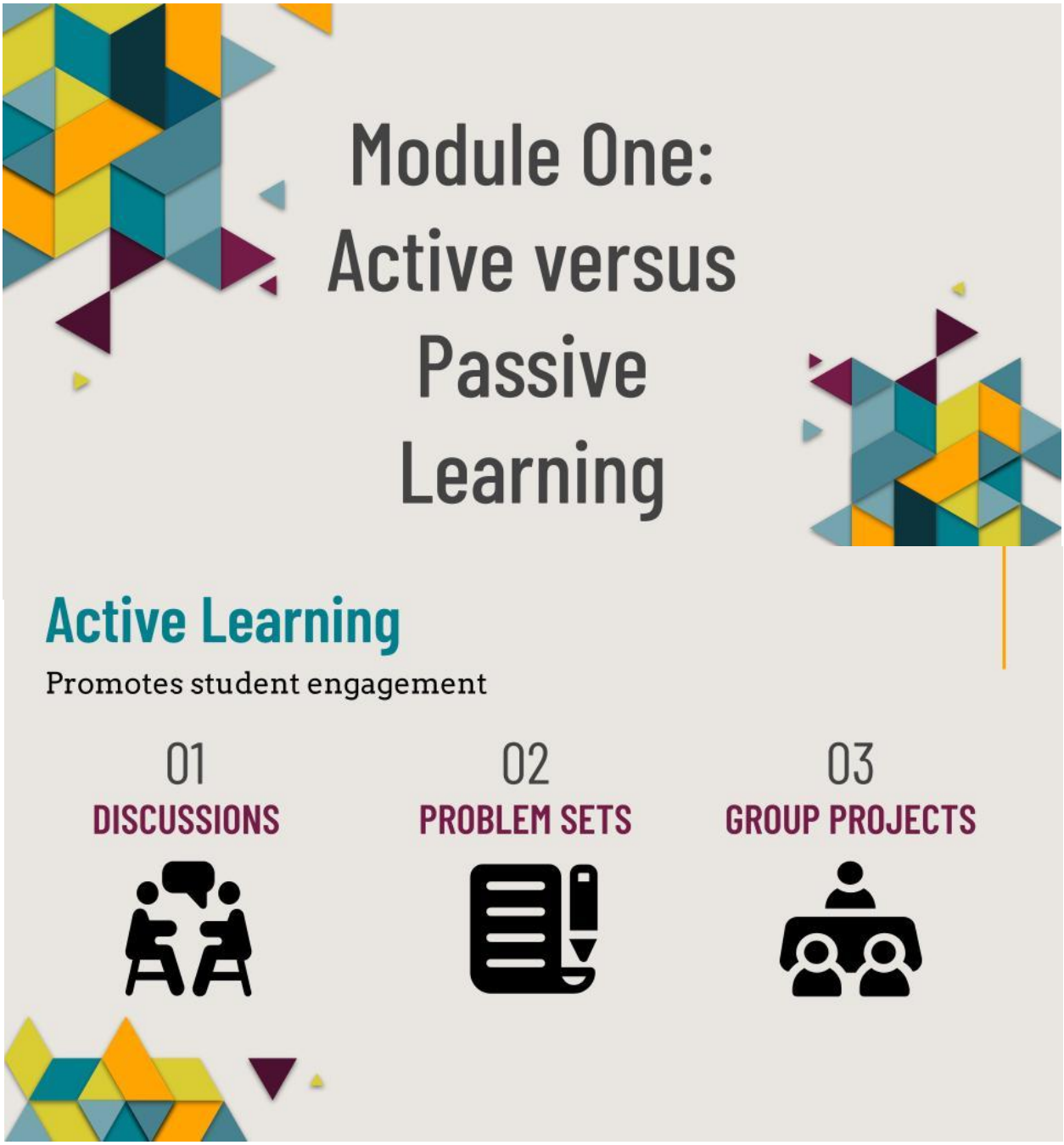
Now that we have defined active and passive learning, how are they different and why are they useful? Firstly, what are their strengths and weaknesses? Active learning is good for student engagement, developing critical thinking skills, and gives the student more agency over their education. This being said, active learning also requires more flexible lesson plans, can limit the amount of material covered at once, and can sometimes promote distractions. Passive learning is more effective for giving larger amounts of information, allows for pre-planned material, and gives the professor more control over what is covered. However, passive learning is not very effective at holding students' attention, may cause boredom and disengagement, gives fewer opportunities for student comprehension, and causes students to be less involved.

Both types of learning have their strengths and their weaknesses, giving both their places in the classroom. It is recommended for online courses that professors send out short, 5–10-minute

pre-recorded videos for students to watch on their own time in addition to reading assignments and homework to cover the passive-learning portion of the course. Then, it is recommended that professors host synchronous video calls with their class with a more interactive style. This synchronous meeting would be ideal for students to ask professors questions they may have on problem sets and to clarify any parts of the videos they did not understand.

This is the end of module 1. Please feel free to review any of the supporting material to continue learning about passive versus active methods.

Video Slides:



Passive Learning

Content absorption

01
LECTURES

02
ASSIGNED READINGS

03
PRESENTATIONS

Strengths and Weaknesses

Active Learning

Strengths

- Student Engagement
- Critical Thinking Skills
- Student Involvement in Learning

Weaknesses

- Requires flexibility
- Limited content coverage
- Possible distractions

Passive Learning

Strengths

- Good for larger amounts of content
- Allows for pre-planning
- Professor control

Weaknesses

- Not good at holding attention
- Can cause boredom
- Less comprehension

Ways to Implement Active Learning

Interactive Video Calls

Host Help Sessions

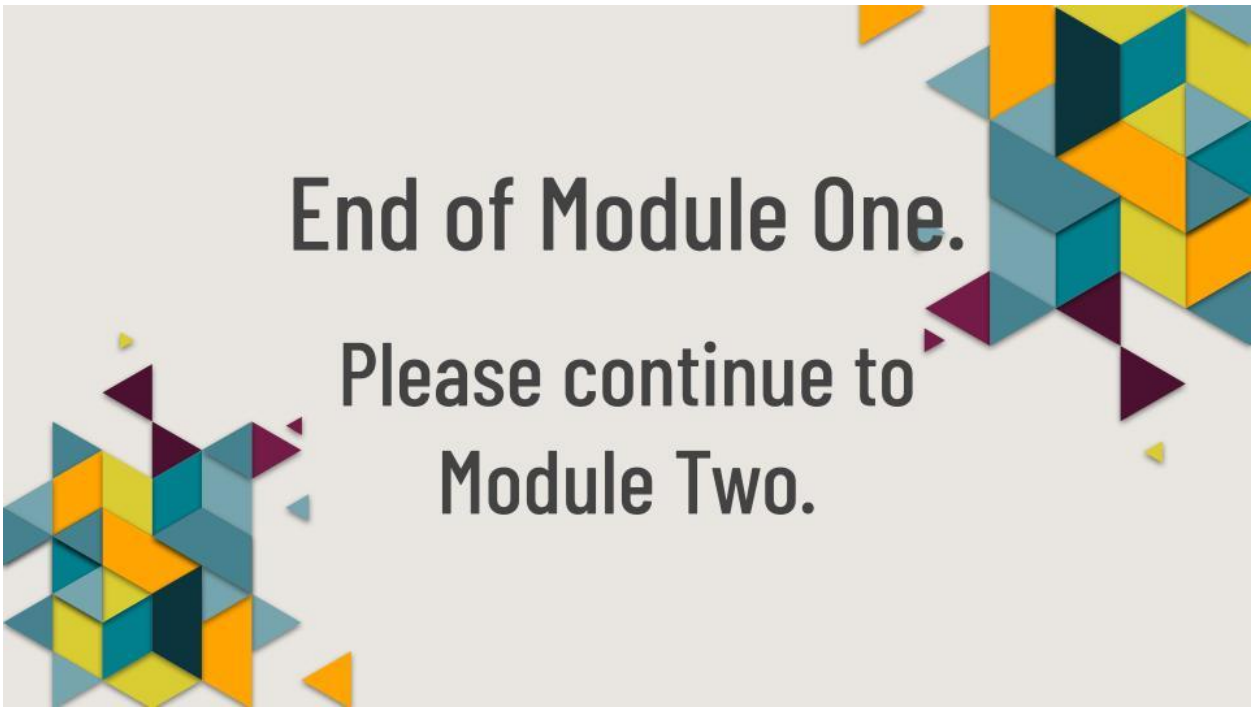
Ways to Implement Passive Learning

5-10 minute video lectures

Reading Assignments

Homeworks

Problem Sets



Supporting Material:

Module 2: Student-Based Learning

Video Script:

Here in module 2, we will focus on a very important aspect of modern pedagogy, student-based learning. Student-based learning is the concept that classes should be based around the needs of the students rather than the professor to ensure better engagement and more productive learning. This, however, should not come at the expense of overworking the professor. The easiest way to think about student-based learning is to look at your course through the point of view of a student. Try to imagine how you would feel if you were taking your own course and only had access to the resources your students have access to. Many students do not have the ability to reliably connect to the wi-fi, so are video calls the most productive way of teaching, or are downloadable videos? Students may find it difficult to retain large amounts of information if given all at once, so would longer lectures or shorter lectures be more effective? And many students won't know the inner workings of your course so what communications could you offer as a professor to ease that lack of knowledge?

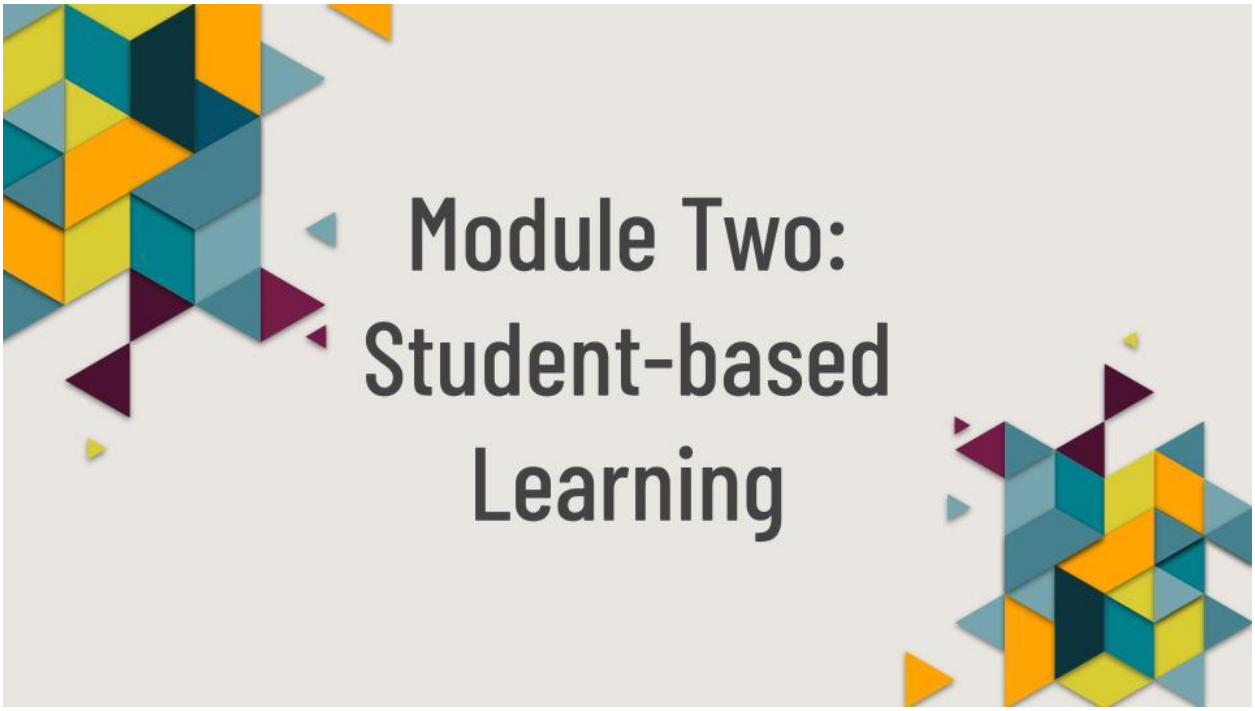
Student-based learning has been cited by many experts in the field of teaching pedagogy as being a more effective approach to organizing a class than teacher-based learning. This is because student-based learning involves the students themselves more heavily and allows them to feel included and engaged in the class. Understanding how your students feel about your class and working WITH them to provide a better learning experience is the first step to making any class more productive in its purpose of education.

One way to include students and keep them engaged is to have frequent and meaningful interaction with them. Be sure to help students along their learning experience, instead of providing passive-learning material and sending them to complete the work on their own. One method of helping students in this way is known as "I do, you do, we do." This is when you first show students

a new concept in a short video lecture, then they complete a set of practice problems on their own, and then you work with them on practice problems and questions they may have together as a class. This is just one of many models used for student-based learning.

This is the end of module 2. Please feel free to review any of the provided supporting material to deepen your understanding of student-based learning.

Video Slides:



What is student based learning?

Classes that are based around student needs without overworking the professor.

Increases student engagement.

More productive learning through meaningful interactions.

Think from a student's point of view.

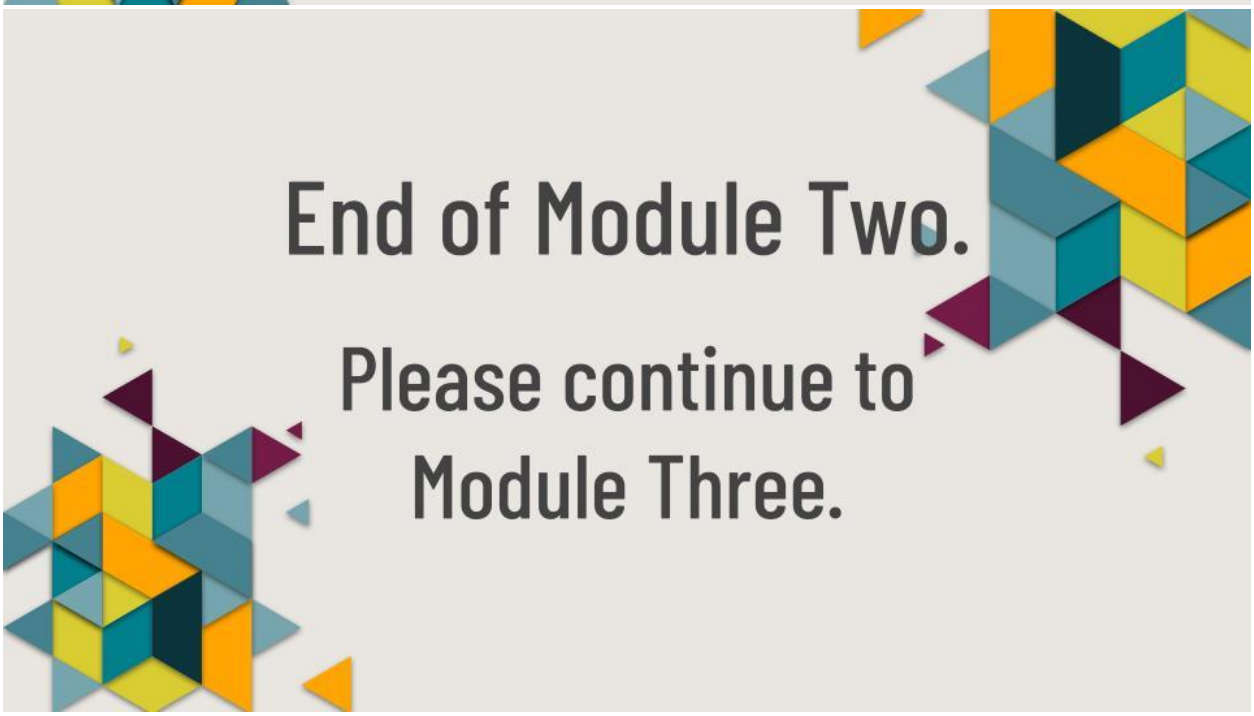
Many students cannot reliably access the Internet.

What is the optimal length of a lecture?

How do you effectively communicate with students?

Imagine you only have access to the same resources your students do.

How can you keep students focused?



Module 3: Learning Outcomes and Assessments

Video Script:

Module 3 focuses on learning outcomes and assessments. It's important to establish learning outcomes early on in the course so that students know what to expect of the course. Instructional design is important in order to improve educational value for students, promote collaboration amongst students and engagement between students and professors, and increase

efficiency in general. With an instructional plan, you can better organize course material to get more education for less work.

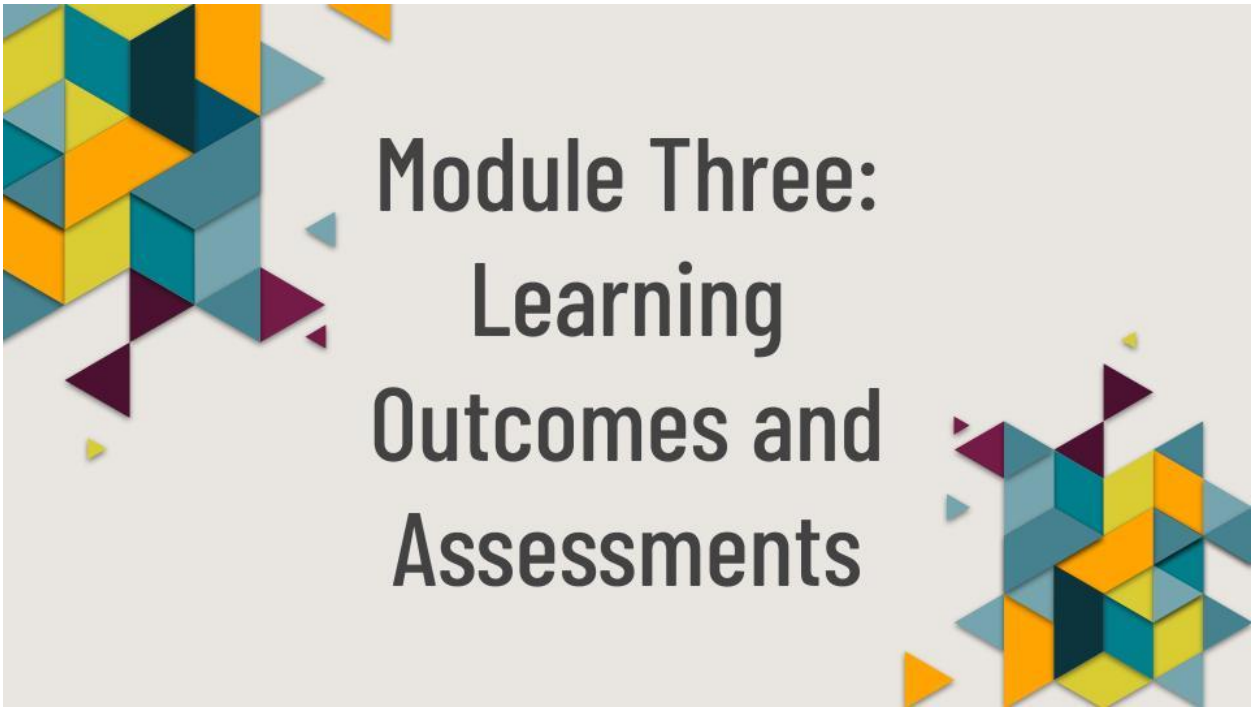
The next piece of this module is course design - which goes hand-in-hand with instructional design. Instructors should be open and willing to learn how to build a course that is the best as possible for their students. Employing a specific person with strengths and expertise in pedagogical practices to focus on course design and working with professors to construct their courses is important to establish a baseline in course and instructional design. While no class is the same, having the same strong foundation makes it easier for instructors to focus on teaching instead of stressing about designing the course itself.

Through instructional and course design, instructors and employees specializing in course design will be able to make learning outcomes clear, which sets expectations across the board. When expectations are clear, students and instructors alike can focus on coursework without worrying about being misunderstood or misunderstanding one another. This becomes especially important when it's time for assessments - whether the assessment is homework, a project, or an exam, establishing expectations ahead of time takes away a lot of the stress of completing and grading that work. Regular and frequent assessments help to keep students on track and ensure that they are keeping up with the course material. These can be short homework assignments, weekly mini-projects, or weekly quizzes to check understanding. For quizzes, utilize auto-grading software whenever you can - this makes it easier to administer more comprehension-checking quizzes without the stress of grading them every week.

Overall, course planning is crucial to a successful, engaging remote course. Since remote education can be isolating, it's important to establish expectations so that students don't feel lost every time they go to complete assessments or attend class.

This is the end of module 3. Please feel free to review any of the provided supporting material to deepen your understanding of the importance of establishing learning outcomes and regular assessments.

Video Slides:



Course Design

01 Be open and willing to build a course that is optimal for students.

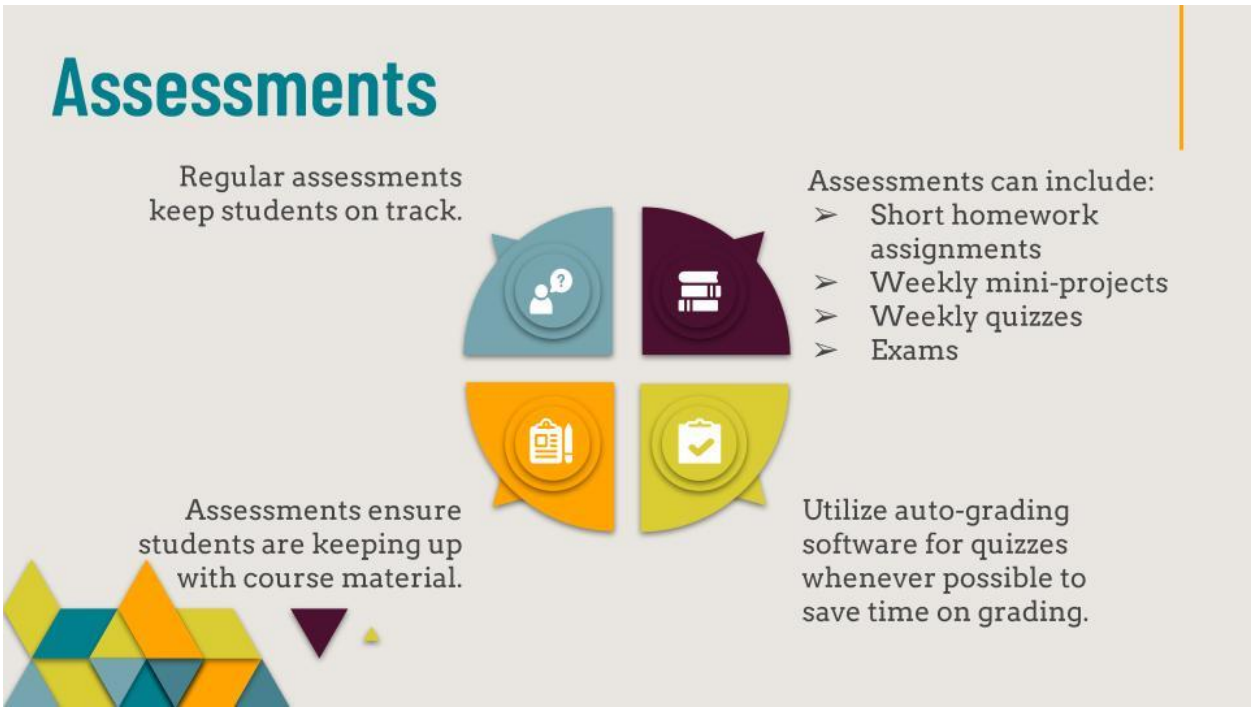
02 Employ someone knowledgeable in pedagogical practices to establish a baseline course design.

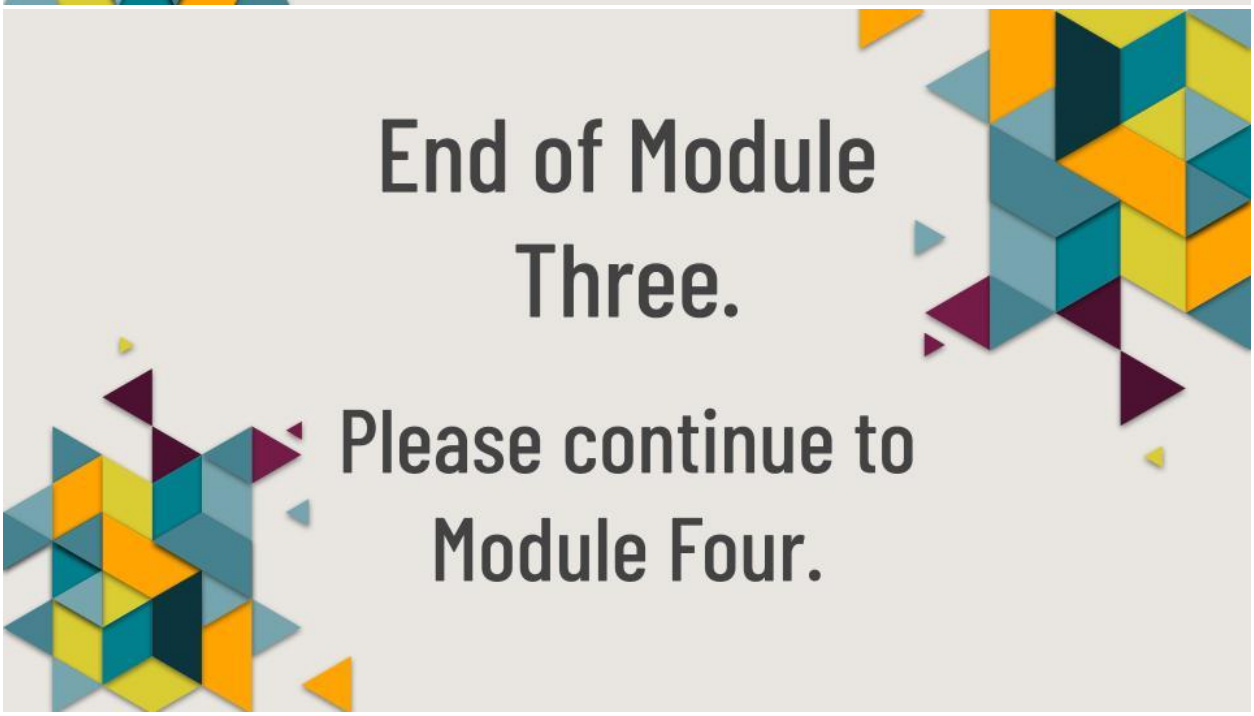
03 Makes it easier for instructors to organize the course so they can focus on teaching.

04 More effective student learning.

Instructional Design + **Course Design** =

- Makes clear learning outcomes
- Sets expectations across the board
- Allows more focus on coursework
- Prevents misunderstandings between students and professors





Supporting Materials:

Module 4: Course Structure

Video Script:

Module 4 covers course structure more in-depth. In previous modules we have talked about different types of learning and ways to think about your course goals. In this module, we will learn

about structuring those concepts in an easy-to-follow format for your students. As previously mentioned, in situations where internet access is unstable or unreliable, it can be helpful to students to be able to download content in the form of short lecture videos. This lends itself to a more asynchronous model of teaching. To begin, your course should be laid out clearly and plainly. Start by grouping topics based on your learning outcomes and assigning them categories, usually called modules. Set up these modules on an organizational app like Microsoft Teams. Then, once you have created your lecture videos, add them to the appropriate module with a title that is easy to understand. Be sure to include in the module any reading material that may be required.

It may also be helpful to include a module focused on class logistics. This would be a location to put information like the class schedule, your availability for questions, how students should contact you, and any class policies. A document containing this type of information is usually called a syllabus. While this content and information will make up the bulk of your class through passive learning, it is also important to include active participation for students that are able. One way of doing this is through video calls with your class where you work with them and help with any questions or difficulties they may have had with lectures or assignments.

Spend your synchronous time connecting with students and working with them, instead of lecturing. This will be a more efficient use of your time and will give your students a more enriching interaction with their professor. The most important aspect of structuring any course is to make it well organized and as easy as possible for students to find information that they may be looking for. Many professors hosting online and remote courses have also noted using a secondary app for quick messaging. It is essential to have somewhere that a student can find all lectures, assignments, and reading materials for their class in one well organized place like Microsoft Teams, but it can also be useful for students to be able to quickly contact their professors to ask them questions about assignments or the class. Some resources that other professors use for this include WhatsApp, Discord, and emailing. Including a space for students to ask each other questions quickly can also be helpful and promote community within the class. Many experts in the field of pedagogy cite classroom community as the most important factor determining a student's success.

To recap, the most important things to consider when structuring your course are organization, clarity, communication with students, and community.

This is the end of module 4. Please feel free to review any of the provided supporting material to learn more about structuring a course in an online environment.

Video Slides:

Module Four: Course Structure

Building an Asynchronous Course

When students do not have the ability to join live lectures due to poor Internet, it can be helpful to have class content available to them asynchronously.

To begin:

1. Lay out the course very clearly.
   a. Start by grouping topics into "modules" based on your learning outcomes.
2. Set up the modules on an app like Microsoft Teams.
3. Place all course materials (recorded lectures, assignments, required readings) in the appropriate modules.

What is a syllabus?

A **syllabus** is a type of document focused on class logistics that may include:

Class schedule, including exam dates, meeting times, etc.

Professor contact information and availability for student questions

Class policies, such as submitting assignments late

How do you engage students?

Be sure to include active participation for students that are able to.

- Spend synchronous time connecting with students and working with them instead of lecturing
- Answer student questions about lectures to provide more clarity
- The most important thing is to make a well-organized course with information that students can easily find.

Communication Platform

A platform with all course materials is necessary, but students should also have a place to quickly ask questions.

Such places can include:

- WhatsApp
- Discord
- Email
- Chats within Microsoft Teams

Increases student-professor interaction.

Also builds a sense of community when students can see and respond to each other's questions and comments.

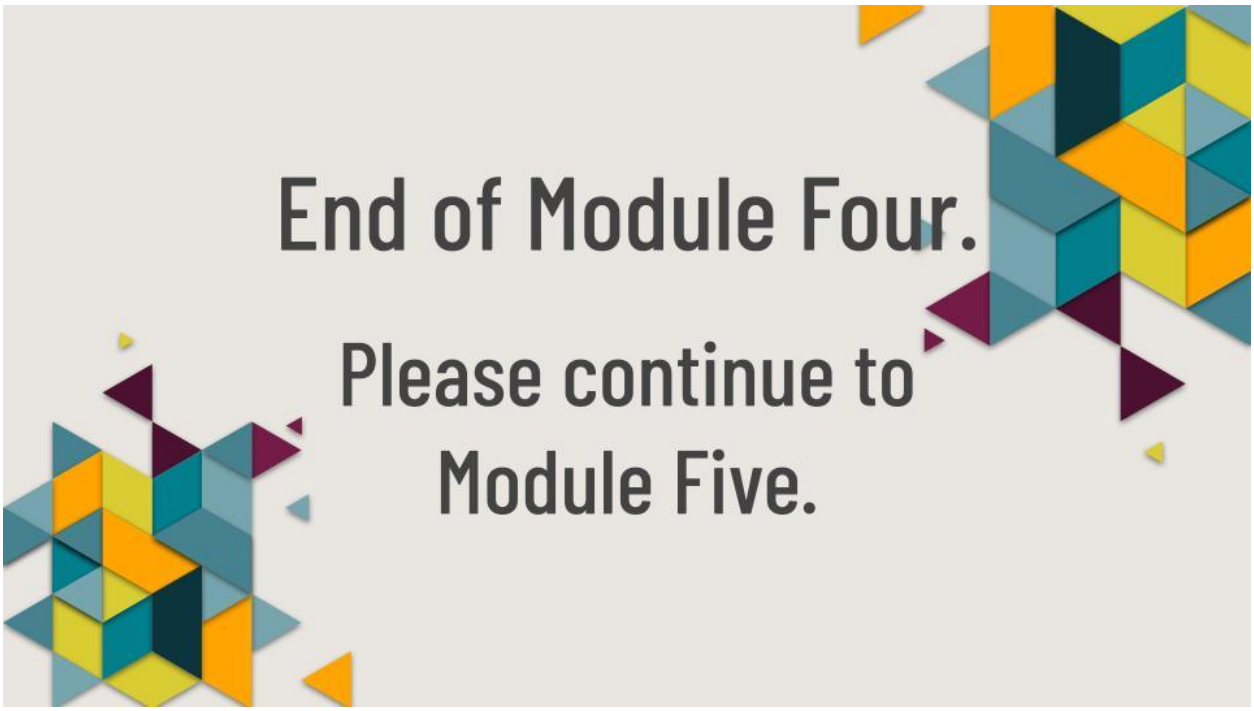
Key Components of Course Structure

Organization

Clarity

Communication between students and professors

A sense of community



Supporting Material:

Module 5: Using Microsoft Teams

Video Script:

Welcome to module 5. In this section, we will be covering some of the basic features of Microsoft Teams and how to use them.

First, let's look at the Teams organization. All teams, once created, will start with a "General" channel. This is a good place to put any posts that you would like students to immediately see upon opening your course. It is advisable to set the permissions of this channel so that only the teacher or owner of the Teams classroom can make posts or edit files.

The first feature of Teams that we will cover is channels. Channels can be used for hosting different types of classroom activities, groups, or topics. In this course there are five channels: General, Announcements, Discussion Board, English Option, and French Option. This is how we differentiate files for those that prefer French and those that prefer English, as well as create dedicated spaces for discussing questions with other people taking the course.

One helpful aspect of the "channels" feature is the ability to control permissions. For example, if you wanted to create a channel specifically for sending class-wide announcements, you could go to "manage channel" and change permissions on that channel to only allow the teacher or owner to post in it. By default, both students and professors will be able to post in any channel.

Another useful feature of Microsoft Teams is the ability to share files. In every channel there is a "posts" tab, for sending messages, and a "files" tab, for sharing documents. This is a good place to post class content like lecture videos, reading material, slide presentations, and

assignments. Remember that it is important to organize all class content well so that students can find files easily.

While messages and file sharing are very useful for asynchronous teaching, Microsoft Teams also has a video call feature which is useful for synchronous teaching.

Once you have opened up a call through Teams, there are some helpful features included in the call. Most notably, the participants tab, the chat, the reactions, and the breakout rooms.

The participants tab is an easy and effective way to see who is connected to the call. This can be used to see how many people are in the call and to take attendance.

The chat is a helpful location for students to put questions while the professor is speaking. This way, they do not have to interrupt, but can still ask their question so the professor can answer it after they are finished talking.

The reactions feature is useful for students to virtually raise their hand so the professor can know when someone in the class has a question. It can also be used to ask students simple poll questions during class that can be answered with a yes or no. This is a good way to check if students are paying attention during class.

Finally, breakout rooms may be one of the most useful features included in video calling. Especially in classes where group or lab work is common, breakout rooms can be used to send students to separate virtual rooms to do work together. The professor can then go room to room checking in on students and answering their questions. This has been noted to be extremely useful for group projects and collaborative work.

Video calls can be useful for teaching, but keep in mind that many students do not have reliable internet, so do not rely on synchronous calls too heavily. Instead put more focus into your asynchronous space and use video calls as an interactive, question answering space.

Leaving the call feature, another aspect of teams that you may wish to use is the calendar. This is a place that you can make a schedule for yourself, as well as share events, class times, and activities with others. This can be a good way to schedule synchronous classes as well as your availability for answering students' questions.

While Microsoft Teams is very useful for building an online course, it can also be helpful to make use of other apps to support your Teams classroom. Most commonly, professors use direct messaging apps like WhatsApp or Discord to keep in contact with their students and to answer questions quickly. This can also promote a sense of community and collaboration, helping to keep students engaged in your class. These apps should not however be used in place of Microsoft Teams as an organizational space.

This has been a brief overview of how to use Microsoft Teams and messaging apps to conduct an online class. If you would like to learn more about the functionalities of Microsoft Teams or any of the other apps mentioned, there are many instructional videos on the topic hosted on YouTube.

Video Slides:

Module Five: Using Microsoft Teams

Microsoft Teams Organization

- All Teams, once created, have a "General" channel
  - Posts on this channel will be the first thing students see when they open your course.
  - TIP: Set the permissions of this channel so that only you can make posts or edit files

Channels

- Uses:
  - Hosting different classroom activities, groups, or topics
- 5 channels in this course
  - General
  - Announcements
  - Discussion Board
  - English Option & French Option
- Ability to control permissions
  - For example: channel settings can be changed to only allow a professor to post. By default, everyone can post.

File Sharing

- "Posts" Tab
  - Sending messages
- "Files" Tab
  - Sharing documents
  - Post class content: lecture videos, reading material, slide presentations, and assignments.
- Remember to organize well so students can easily find course materials.

Video Conference Features

- Participants Tab
  - Seeing who is present in class
  - Useful for taking attendance
- Chat
  - Students may type their questions into the chat during the lecture.
  - Students can answer each other's questions or wait for the professor to respond

Video Conference Features

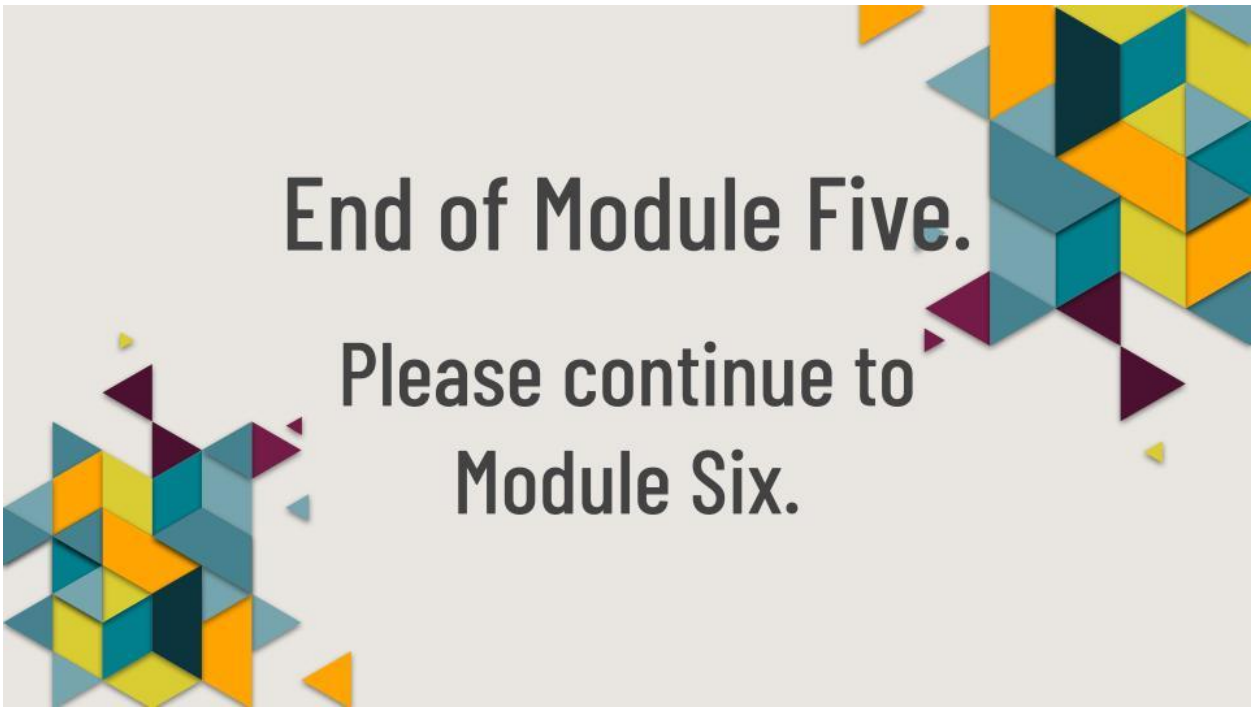
- Reactions
  - Students may virtually raise their hands so professors know they have a question
  - May also be used for simple in-class polls to check if students are paying attention
- Breakout rooms
  - Sends students to separate virtual rooms to do work together.
  - The professor can go from room to room and answer questions.
  - Very useful for collaboration

Other Features

- Do not rely on video conferencing
  - Many students have unreliable Internet access.
  - Use video conferences as interactive spaces to answer questions.
- Calendar
  - Make a schedule for yourself
  - Share events, classtimes, and activities with others
  - Good way to schedule synchronous classes and availability to answer student questions

Other Apps

- Direct messaging apps
  - WhatsApp
  - Discord
- Good for quick communication
- Should not be used in place of Teams



Supporting Material:

Module 6: Communication and Feedback

Video Script:

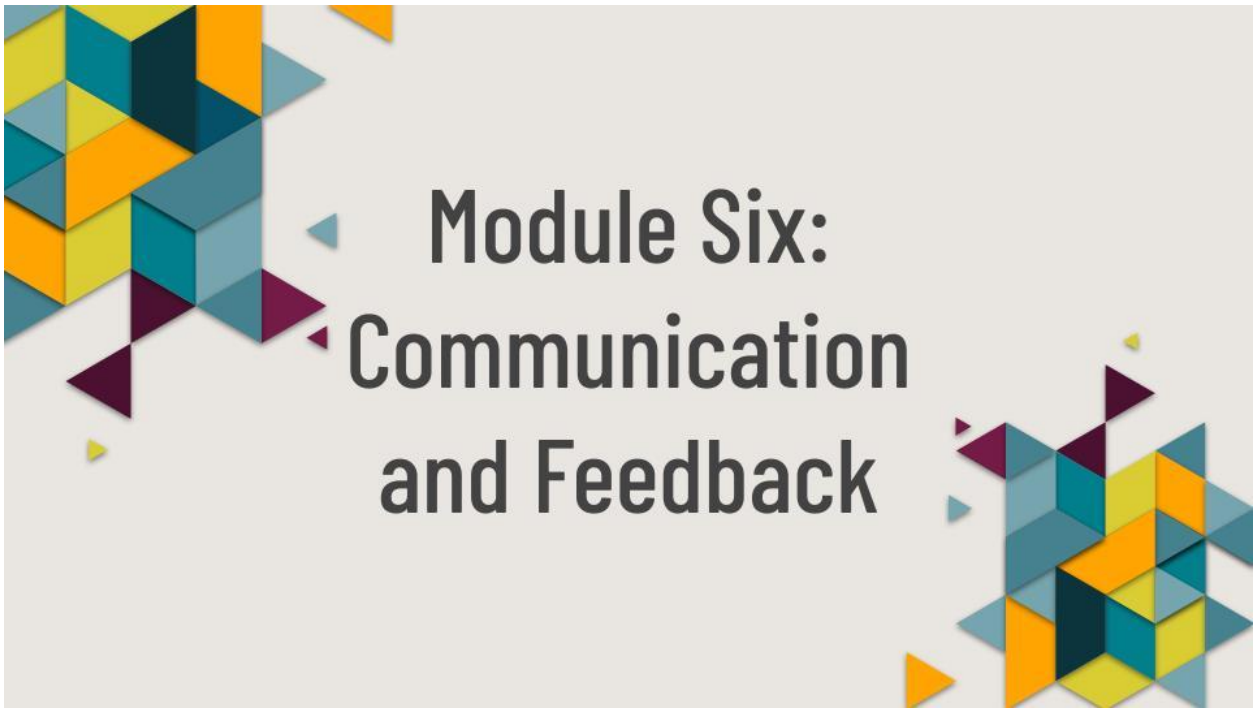
Module 6 will discuss the importance of communication and feedback. As mentioned previously in modules 3 and 4, setting expectations for the course is crucial to student success. These expectations can be most easily communicated through a syllabus - a document or email that outlines course dates, assessments and their weights, and any other information that is important to understand before the course begins. Students should be able to reference the syllabus throughout the course. A syllabus provides a solid foundation for the entire course and sets a precedent for what students can expect when they show up to the first day of class. For asynchronous courses, providing a short video (three to five minutes) to explain the syllabus and go over how the course will work further eliminates any confusion around wording or anything that you feel needs to be reiterated. Having a document that your students can reference throughout the course will help to eliminate lots of very simple confusion about deadlines, course meeting times, and what to expect throughout the class.

Another important part of communication is announcements. The ability to make class-wide announcements is helpful in ensuring that everyone is on the same page about changing deadlines, changing expectations, and anything else that comes up throughout the course that was not initially posted on your syllabus. Rely heavily on written communication throughout your remote courses so that students who are unable to attend live lectures still receive the same information as those who are able to attend synchronous classes. These announcements can be made through Microsoft Teams or other messaging platforms - the important thing is to make it clear at the beginning of the course which platform you will be using so that students don’t miss important announcements.

Lastly, let's look at the importance of clear, concise feedback on assessments of any kind. When delivering feedback, ensure that your comments are easy to understand and cannot be misinterpreted. Follow the guidelines that you set up in your syllabus to grade assignments and give feedback to students on their work. Constructive feedback will also help to foster a community within your class - something that, again, is crucial to student development and success. Academic feedback is more related to achievement than any other practice - this means that students who receive helpful feedback are more inclined to deliver on the comments that you made and improve their work over time. It is important to reinforce learning through feedback. Effective feedback is frequent, timely, specific, invites action, and is personalized. Instead of saying "good job," say something specific about the work that you liked - personalize your comments to improve student engagement and add an action item at the end so that the student has a way to use or implement the given feedback. Meaningful feedback is more than a letter or a numerical grade, is constructive, and is goal oriented. Some models for feedback are standardizing the instructor to student feedback, implementing self-assessments and reflections, administering automated quick quizzes, and creating a peer review and assessment assignment. These models will help you to vary your feedback to keep your students engaged and active in class.

This is the end of module 6. Please feel free to review any of the provided supporting material to deepen your understanding of the importance of effective communication and feedback.

Video Slides:



The Syllabus

What is a **syllabus**, and why is it important?

- Contents
  - Course dates
  - Assessments and their weight on the final grade
  - Any other important course info
- Importance
  - Eliminates confusion by setting a precedent for the first day of class
  - Students know what to expect and can plan out their time
- Spend 3-5 minutes reviewing the syllabus in a video to provide more clarity for students.

Announcements

- Contents
  - Changing deadlines, expectations, etc
  - Cancelling a class
  - Anything unexpected not included in the syllabus
- Importance
  - Ensures students and professors are on the same page
  - Relying heavily on written communication like this makes sure **all** students receive this information, not just those in synchronous class.
- Can be made over many platforms
  - Just make sure students know what platform announcements are on, and keep it consistent

Importance of Feedback

- Make comments that are easy to understand
- Follow guidelines set up in your syllabus to grade assignments
- Feedback increases student engagement

Types of Feedback

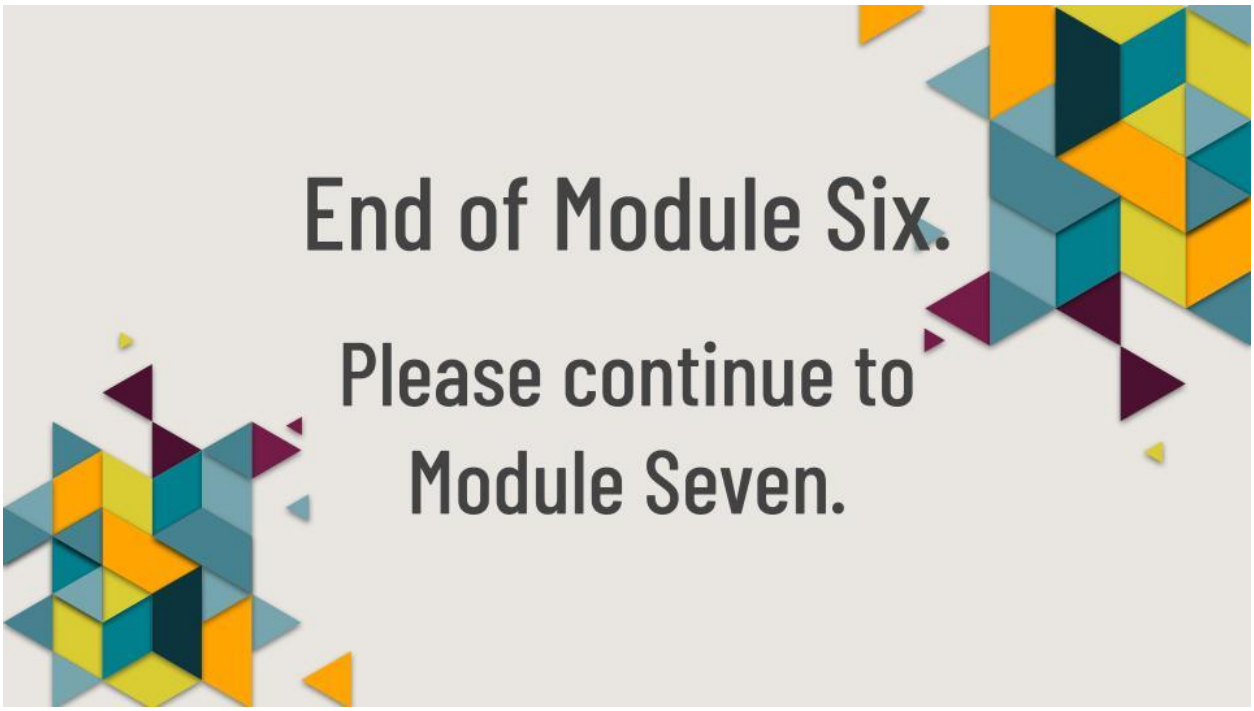
- Constructive Feedback
  - Fosters a community
- Academic Feedback
  - Achievement-focused
  - Reinforces learning
  - Students deliver on comments made and improve their work

Types of Feedback

- Effective Feedback
  - Frequent, timely, specific, invites action, and is personalized
  - Personalized comments improve student engagement and adding action items gives students a way to implement the feedback
- Meaningful Feedback
  - More than a grade
  - Goal-oriented

Feedback Models

- Standardizing instructor-to-student feedback
- Implement student self-assessments and reflections
- Administer automated quick quizzes
- Peer reviews
- Assessment assignments



Supporting Materials:

Module 7: Collaboration and Group Work

Video Script:

Welcome to module 7, where we will cover the importance of collaboration and group work in remote education. One of the largest obstacles for learning when taking remote courses is a lack of engagement. It's inherently difficult to engage with people who you cannot see or do not physically interact with regularly. In order to build the community that is present in in-person classes, it's important to encourage group work, give individual grades as well as group grades, and have students complete self-assessments throughout the course.

Collaboration and group work is the best way to engage students in remote courses and increase learning retention - this is crucial for student development. This gives them a few peers to work with closely and get to know over the duration of the class. They now have a group that they can go to with questions about material, a group they can study with, and some new friends. This helps to create the community that is typically missing from remote courses because of the lack of interaction. This is even more important for students who are unable to attend live video calls or for asynchronous classes. Interactions between students through real-world tasks also helps them to develop group work skills which are necessary for success. Utilize discussion board or chat features within Microsoft Teams - this is an easy way to promote collaboration and interaction.

Giving both individual and group grades strengthens the sense of community and camaraderie amongst groups of students working together. When the whole group has to work towards a good grade, it puts more importance on doing well and getting along with your team. The accountability of having graded assignments as a team and as an individual mitigates free-

loading students who let their group mates complete all the work yet still take credit and receive a good grade. By assigning individual grades in addition to group grades, students are less likely to under-perform in group assignments and in classes as a whole.

It is important to keep a good balance between group and individual work and assessments. It is also important to keep a balance between activities and assignments that are not too hard and not too easy - this balance allows for students to bounce back after hard assignments and stay focused throughout the course.

This is the end of module 7. Please feel free to review any of the provided supporting material to deepen your understanding of the importance of collaboration and group work.

Video Slides:

Building a Remote Community

A sense of community is a very important factor in successful student learning, but it can be difficult to engage with people you are not physically with.

Encourage group-work and collaboration

Give individual and group grades

Have students complete self-assessments throughout the course

Benefits of Collaboration

Group-work increases learning retention.

Students form small groups that they can go to with questions about material, study with, and form friendships with.

Builds a sense of community by increasing social interaction, especially for students that cannot join synchronous classes.

Also helps students develop necessary collaboration skills through real-world tasks.

Utilize discussion board/chat features to promote interaction.

Benefits of Individual and Group Grades

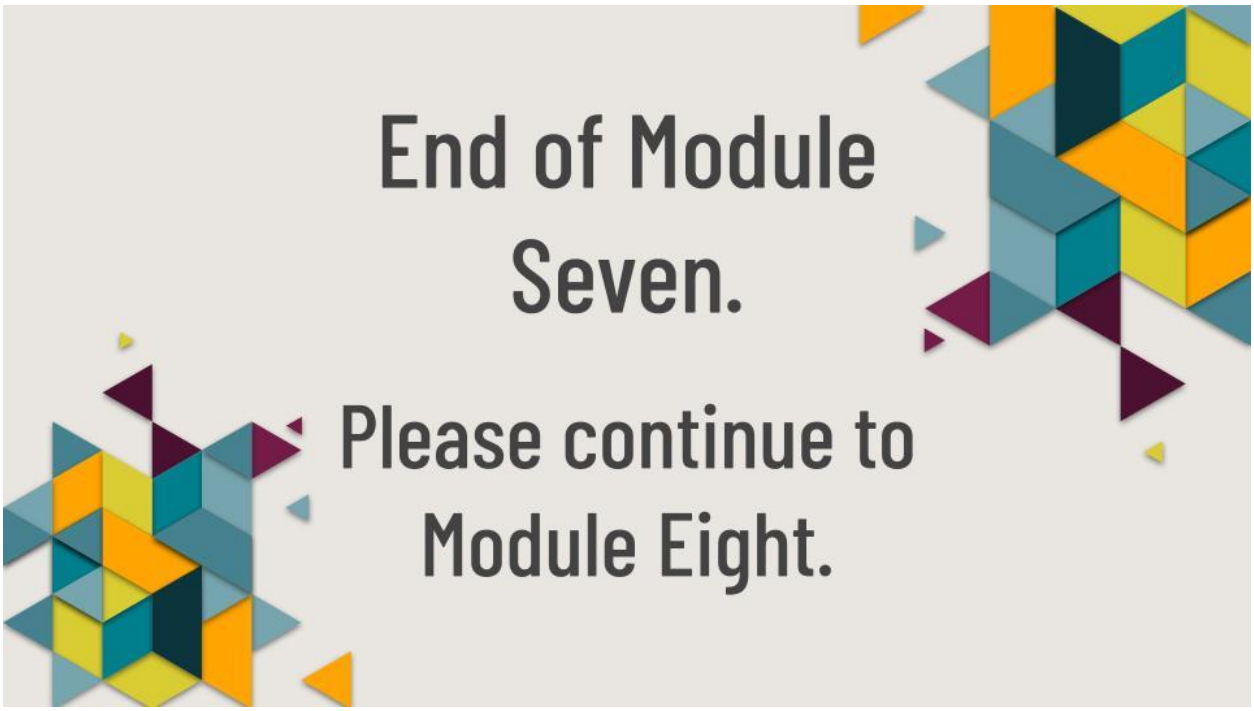
Group grades provide a sense of community and camaraderie by having the whole group working towards a good grade.

The whole team working together towards a good grade puts more importance on doing well and getting along with your group mates.

Individual grades prevent students from not doing any work and taking credit for their group mates' effort.

Keep in Mind

- Maintain a balance between group-work and individual work.
- Maintain a balance between harder and easier assignments
  - Allows students to bounce back after hard assignments
  - Hard assignments challenge them
  - The combination improves focus



Supporting Materials:

Module 8: Outro and Recap

Video Script:

Thank you for participating in this instructional workshop. To briefly recap, we have covered concepts regarding Active versus passive learning, student-based learning, learning outcomes and assessments, course structures, Using Microsoft Teams for remote education, communication and feedback, and collaboration and group work. If you had any questions about any of the topics, feel free to rewatch any of the videos, read the provided supporting material, or talk to other professors in the discussions channel. We hope this workshop was helpful and feel free to share with other professors or teachers that you may know. Our group would also like to thank the Morgan Center for Teaching and Learning for giving us permission to rework and reuse their material to create this short instructional workshop based upon their original course content. Thank you, and happy teaching.

Video Slides:

Topics Covered:

1. Active versus Passive Learning
2. Student-based Learning
3. Learning Outcomes and Assessments
4. Course Structure
5. Using Microsoft Teams
6. Communication and Feedback
7. Collaboration and Group-work

If you had any questions about any of the topics, feel free to re-watch any of the videos, read the provided supporting material, or talk to other professors in the discussions channel.

We hope this workshop was helpful. Please feel free to share this with other professors or teachers that you may know.

Acknowledgements: Morgan Learning Center

Our group would like to thank the Morgan Center for Teaching and Learning at WPI for giving us permission to rework and reuse their material to create this short instructional workshop based upon their original course content.


Thank you
and happy
teaching!