



WPI

Refining the Online Institute to Create Stronger Partnerships and Enhance the Scale of Impact

An Interactive Qualifying Project Proposal

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Abstract

The Online Institute was launched in 2020 by Worcester Polytechnic Institute in response to the global educational emergency caused by the Covid-19 pandemic. Its goal is to assist higher education institutions by empowering them to develop online educational programs to meet their needs. We conducted interviews, surveys, and researched online learning platforms. We created a website, recorded instructional videos, and developed recommendations for improving event participation, for using online learning platforms, and for expanding the reach of the Online Institute.

Acknowledgements

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Executive Summary

Higher education is recognized as a key element for modernization and development, but only 6% of young people in sub-Saharan Africa are enrolled in higher education institutions (Teferra, 2004). Challenges such as political instability, a global pandemic, limited infrastructure, and social inequality are factors contributing to the low output of college students in the region. For sub-Saharan Africa to succeed economically and politically, the higher education sector must be strong (Teferra, 2004).

The WPI Online Institute was launched in July, 2020 in response to the global educational emergency caused by the Covid-19 pandemic. Universities around the world were forced to close their campuses which left millions of university students unable to continue their studies due to the lack of infrastructure in place for the delivery of remote learning. The goal of the Online Institute is to assist higher education institutions throughout Africa to conduct online learning by empowering them to advance their expertise in developing online educational programs to meet their needs.

The Online Institute consists of three phases, the first of which is free and offers a high-level overview of the program. The second phase is the ideation, exploration, and prototyping stage. During this phase of the program, the participants develop solutions to their unique online education challenges with the help of the WPI Online Institute leaders. The third and final phase of the Online Institute is the implementation and support phase. During this phase WPI acts as a consultant to help discuss and address problems that arise as the participants are actively implementing the solutions they developed in Phase II. WPI invited experts to share their knowledge in topics such as online pedagogy and industry connections to provide the African partners with ideas on how to implement their own online programs.

Goal of Project

The goal of our project was to improve the participation, communication, and organization of the Online Institute so that it can help guide African institutions to create remote learning capabilities for their students. To achieve this goal, our team formed the following research objectives:

1. Research best website design practices and evaluate similar educational website designs to decide the best design for the Online Institute website.
2. Conduct interviews to determine the necessary website content.
3. Implement a website prototype that will be beneficial to both the program participants and program leaders.
4. Analyze Online Institute data to create a set of recommendations to improve the program.

Methods

To meet our first objective, our team analyzed the design features of university websites that were cited as well-designed educational websites in Sudhir's article, *7 Wonderful Educational Website Designs For Inspiration*. Our team also researched website design best practices that were backed by scientific studies.

To determine the website content to meet our second objective, we conducted interviews with six different people. Our team interviewed Online Institute organizers Carrie West and Professor Doiron, data management experts Siamak Najafi and Ermal Toto, event speaker Michael Ahern, and WPI Provost Soboyejo. Each interview offered us a different understanding of useful website content.

To fulfill our third objective of implementing a website prototype beneficial to both program leaders and program participants, our team first created a website prototype using the

free website builder Weebly. We used the research findings from our previous two objectives to create the website. Our team then distributed surveys to our fellow IQP cohort students, friends, and family to obtain feedback on the design of the website. In addition to distributing a survey, our team interviewed data management experts Siamak Najafi and Ermal Toto to learn how to create a secure WordPress website for the program.

In order to satisfy our fourth objective we analyzed data from our feedback survey sent to the program participants, attended live Phase III events, and researched online learning platforms. Our team determined the best online learning platform for the Online Institute by creating a weighted decision matrix ranking six different platforms on the categories of cost, bandwidth, compatibility with a website, ease of administration, device optimization, scalability, and familiarity.

Results

The results of our first research objective established to our team that a well-designed website should contain a simple layout, have a consistent color scheme, include a well-organized menu, and be mobile-friendly.

From the completion of our second objective, our team determined that the Online Institute website must include an overview of the program, a page explaining the expectations for participants, registration information, event dates, and past event content.

Through the completion of our third objective we learned that the majority of our survey respondents found our website prototype to be well-designed and easy to navigate. Then, with the help of Ermal Toto and Siamak Najafi, we were able to transfer the content from our Weebly prototype to a more secure WPI WordPress site.

The results of our fourth objective indicated that the main areas for improvement of the Online Institute program are increasing participation, improving communication between the African partners and WPI, and improving the organization of the program content. Through the completion of our platform decision matrix, we determined that the combination of the platforms Zoom, YouTube, and Slack would be the most beneficial due to their low bandwidth, functionalities, and familiarity among the participants.

Recommendations

Based on our findings from our surveys, interviews, live event data, and research, our team developed the following recommendations to improve the Online Institute.

1. Increase event participation by establishing participation expectations and utilizing break out rooms.
2. Improve communication by increasing email use and creating Slack instructional tutorials.
3. Maximize the effectiveness of Zoom and YouTube platforms by identifying “thought leaders”.
4. Utilize the Online Institute website as a central source of information.

Our first recommendation is that participants be made aware of the expectations of each event before it begins. We suggest event speakers send an email reminder to the program participants at least a day before live events explaining the format of the upcoming event.

Another method to improve event participation is utilizing the Zoom breakout rooms.

Our second recommendation is to improve the communication between WPI and the African partners by continuing to use Slack as a communication platform. Slack was chosen because of the compatibility with the website, familiarity with the participants, organizational

potential, and low bandwidth requirements. Our team found that using Slack can be challenging for some participants to learn at first. To address this problem, we recommend that the WPI instructors post an informational Slack tutorial. Our team also recommends utilizing email more frequently to communicate with the African partners directly.

Our third recommendation is intended to maximize the effectiveness of the platforms Zoom and YouTube. Zoom is ideal for attending live events and allows for interaction that best mimics an in-person setting. Zoom breakout rooms can be used to create smaller groups which our survey results indicate will increase program engagement. However, the limited number of 100 users or 1,000 users with the Large Meeting add-on is a challenge. Our team recommends that when a large audience is expected, “thought leaders” be identified among the African universities participants, and only they will be invited to attend the Zoom call. Thought leaders are individuals within the groups who are comfortable speaking during live events. Others interested can view the event on YouTube and use the chat feature.

Our fourth recommendation is to use the Online Institute website as a central source of information for past content and additional information about the program. Our team recommends a registration portal be implemented onto the website and the Phase II and III content require a login to access.

Our team recommends that in the future the Online Institute focus on outreach and scaling the program up globally by creating social media accounts and conducting outreach initiatives by emailing institutions and creating marketing videos.

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1 Introduction

Higher education is recognized as a key element for modernization and development, however, only 6% of young people in Sub-Saharan Africa are enrolled in higher education institutions.

Within many Sub-Saharan African institutions, the funding and systemic infrastructural problems have contributed to not only the lack of participation, but also caused some universities to be unable to meet the demands of the Science, Technology, Education, and Mathematics (STEM) fields (Mugo, 2020). Two reasons for the low enrollment in higher education in Sub-Saharan Africa are the limited number of higher education institutions and the high costs associated with attending those institutions (Teferra, 2004). Challenges such as political instability, the Covid-19 pandemic, and social inequality also remain a factor in the low output of college students in the region. While there has been a large increase in demand for access to higher education in Africa, supply is lacking. For Sub-Saharan Africa to succeed economically and politically, the higher education sector must be strong, and academic institutions are a key component to achieving a better future (Teferra, 2004).

The current educational problem facing much of the world including Sub-Saharan Africa is the transition to remote learning caused by the COVID-19 pandemic. Many governments in Sub-Saharan Africa decided to close higher education institutions in response to the threat of the virus. The lack of infrastructure in place for the delivery of remote learning left millions of university students unable to continue their studies (Joseph Doiron, Personal Communication, February 22, 2021).

The WPI Online Institute was launched in July, 2020 in response to the global educational emergency. The program was created to spread the knowledge that WPI gathered while switching to distanced learning status. The objective was to guide institutions to create

viable solutions for their unique situation. The Online Institute consists of three phases, the first of which is free and offers a high-level overview of the program. The second phase is the ideation, exploration, and prototyping stage. During the second phase, participants develop solutions to their unique online education challenges with the help of the WPI Online Institute leaders. The third and final phase of the Online Institute is the implementation and support phase. During this phase WPI acts as a consultant to help discuss and address problems that arise as the participants are actively implementing the solutions they developed in Phase II to meet their universities' needs. WPI invited experts to share their knowledge in topics such as online pedagogy and online education for industry to provide the African partners with ideas on how to implement their own online programs. The Online Institute has completed all three phases of the first version of the program. The final phase of version one was completed in May, 2021.

While the Online Institute program was highly successful, there was still room for improvement in the areas of event participation, communication between WPI and the African partners, and organization of the program content. One challenge the Online Institute faced was the lack of participation during live events and the dwindling numbers of participants as the phases progressed. Another area for improvement within the Online Institute was improving communication between WPI and the African partners. Lastly, the Online Institute lacked a central source of information such as a website where participants can access general information and recorded event content.

Our team's goal was to improve the Online Institute so that it can better guide African institutions to create remote learning capabilities for their students. To accomplish this goal our team focused on improving communication between WPI and the African partners, increasing event participation, and creating a website prototype to better organize the program content.

2 Background

In this chapter, we covered the topics of African education, online learning, website design, and the Online Institute. The first topic we covered was African education, which provided an overview of the challenges facing African education and the effects the pandemic has had on African education. The next section we covered is online learning, which began with an overview of online learning in Africa and then explained the process of delivering an online education successfully. The next topic we covered is website design. In this section we went into detail about the best practices of website design. The final topic we covered is the Online Institute. In this section, we described the Online Institute and its goals.

2.1 African Education

2.1.1 Challenges in African Education

The challenges African communities face related to education are funding, growth of private institutions, governance and autonomy, management, problems of scholarly communication, and language (Vandeyar, 2015). Many institutions in Africa are overpopulated with students, understaffed, and underfunded. Resources have declined due to inflation, decreasing exchange rate, economic and political turmoil, and structural adjustment programs. Africa faces a significant challenge in providing access to higher education, while already enrolling between four to five million students in their postsecondary institutions (Vandeyar, 2015). For a continent where only 24% of the population has internet access and most of those people have poor connectivity and frequent power outages, the transition to online learning is a challenge

(Vandeyar, 2015). A substantial portion of the higher education community in Sub-Saharan Africa does not have access to sufficient internet or technological tools (Vandeyar, 2015).

Another challenge revolves around the ICT (Information and Communication Technologies) related infrastructure. A survey conducted in late January 2020 was used to analyze the factors that affect perception on the ICT policy implementation of higher education in Namibia from a students' perspective (Steiner, Tirivayi, Jensen & Gakio, 2005). The internet connectivity in post-secondary institutions is overpriced, poorly managed, and insufficient. The average African university has bandwidth capacity equivalent to a broadband residential connection available in Europe, and costs 50 times more than their educational counterparts in the rest of the world (Steiner, Tirivayi, Jensen & Gakio, 2005). A platform that can work without having to depend on network connectivity would greatly increase participation in online learning.

2.1.2 Effects of COVID-19 on Higher Education Learning in Africa

In response to the global pandemic, many African governments decided to close educational institutions to prevent the spread of Covid-19. Two major issues that hold serious implications in the fight against the pandemic in Africa are online teaching, and the economic impact of the pandemic on African higher education (Tamrat, W., & Teferra, D., 2020).

According to UNESCO, 9.8 million African students are experiencing disruption in their studies due to the closure of higher education institutions (UNESCO, 2020). The effects of the pandemic on education are also affecting different groups of people disproportionately. Figure 1 below shows the results of a survey conducted in Africa surveying which groups of learners will be most disadvantaged due to the pandemic.

In your country, which group of learners do you think will be most educationally disadvantaged as a result of the crisis?

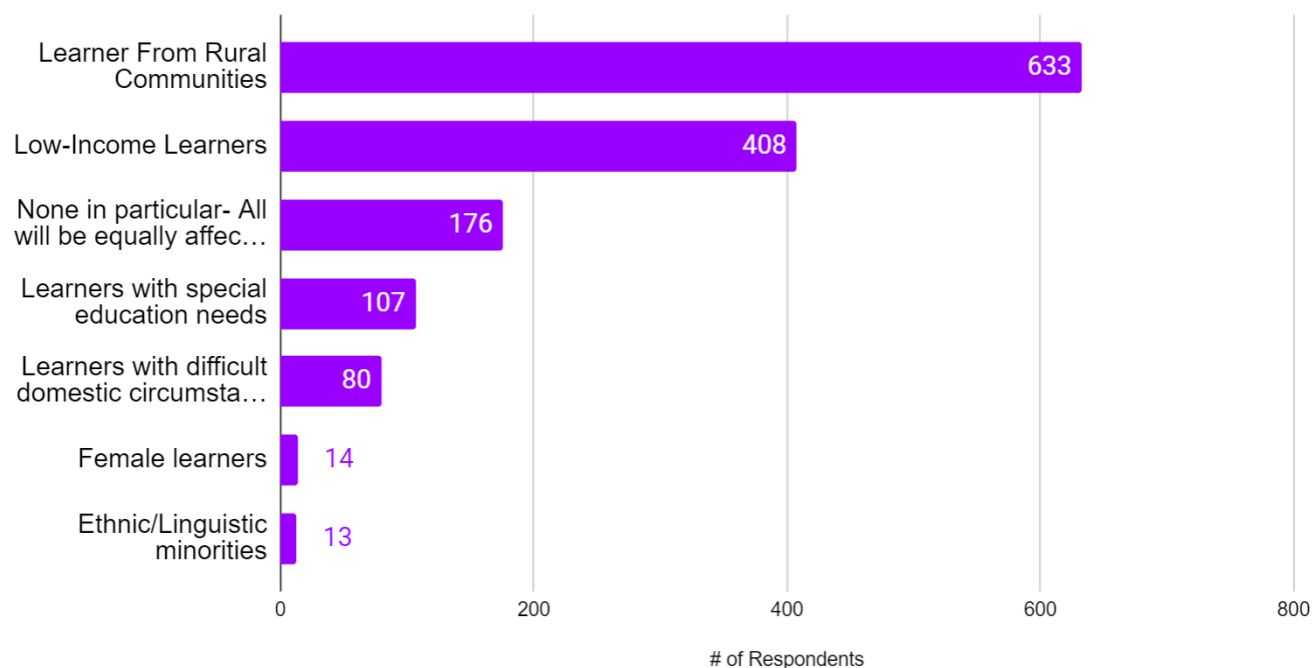


Figure 1: Effects of COVID on different groups of learners

Image Source: *The Effect of Covid-19 on Education in Africa and its Implications for the Use of Technology*. 2020

2.2 Online Learning

Students find that it is much more difficult to learn online because they are learning alone and without the help of live teachers or other students. Online learning transforms education from teacher-centered to student-centered where students must be responsible for their own learning (Koi-Akrofi, 2020). Without the hands-on experience and social interactions of in person school,

many students do not feel capable of being able to do productive work in the real world (Koi-Akrofi, 2020).

Two types of online learning delivery are synchronous learning and asynchronous learning. Synchronous learning is when the student and teacher are participating at the same time, while asynchronous is a delivery style that follows a format of posting recorded material for students to learn on their own time. The platforms that an institute uses for their course delivery can play a large part in the final delivery of the material (Ferri, 2020).

Online learning students have responded best to instructors who present a wide variety of delivery systems. Instructors who provide classes with a mix of content including YouTube videos, discussion boards, and online content had students report the best class experience (Ferri, 2020). Another tool that improves engagement in online learning is the use of SMS texting. In one study conducted by Graham and Miaoulis (2010), it was found that most students would take advantage of an in-class SMS text messaging system to ask questions and to answer questions posed by the teacher. The study found that students participated more in class when the text messaging system was used (Graham, 2013). Even before the COVID-19 pandemic, the participation in online higher-education was rising every year. Learning how to offer it effectively could benefit universities potentially after in-person learning continues.

2.2.1 Online Learning in Africa

Many students in Sub-Saharan Africa do not have access to computers and most students lack internet connection (Tamrat, W., & Teferra, D., 2020). The rural African community feels especially alienated from the online schooling community because they do not have electricity and do not have devices with internet access. According to the WorldBank only 25% of individuals in Sub-Saharan Africa had access to the internet in 2019 and 47% had access to

electricity in 2019. These low numbers make it difficult for students to receive an education online because many struggle to connect to the internet (WorldBank, 2019). The low percentage of internet users in Africa can be seen below in Figure 2.

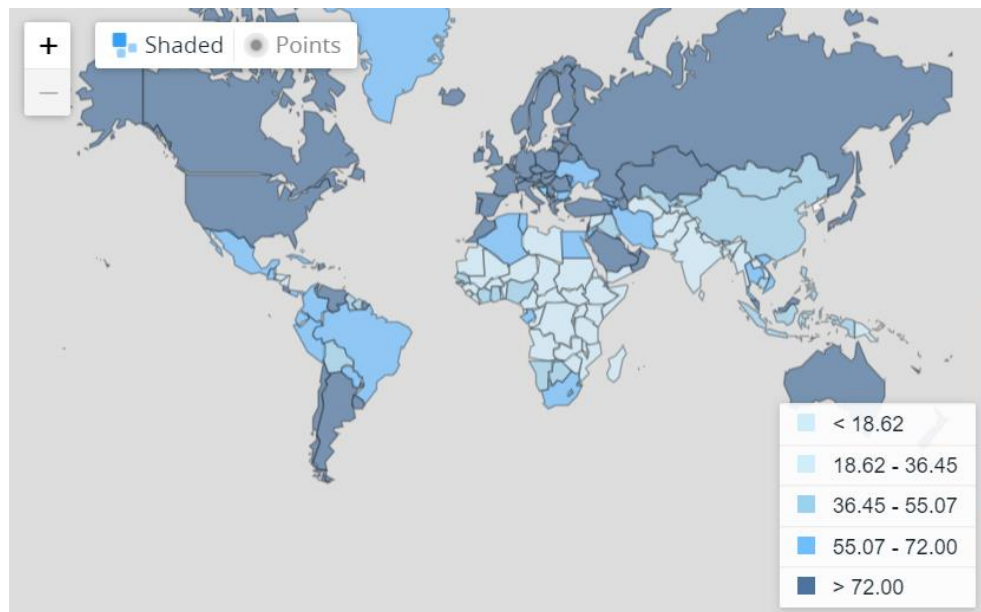


Figure 2: World map of internet users by percent of population

Image Source: *The World Bank*

Statistics shown by UNESCO indicate that e-learning was improving in Ghana, but due to the lack of infrastructure in Sub-Saharan Africa, their online education program was a challenge to implement (Kotoua, Ilkan ,Kilic, 2015). Figure 3 highlights many of the challenges impacting African online learning.

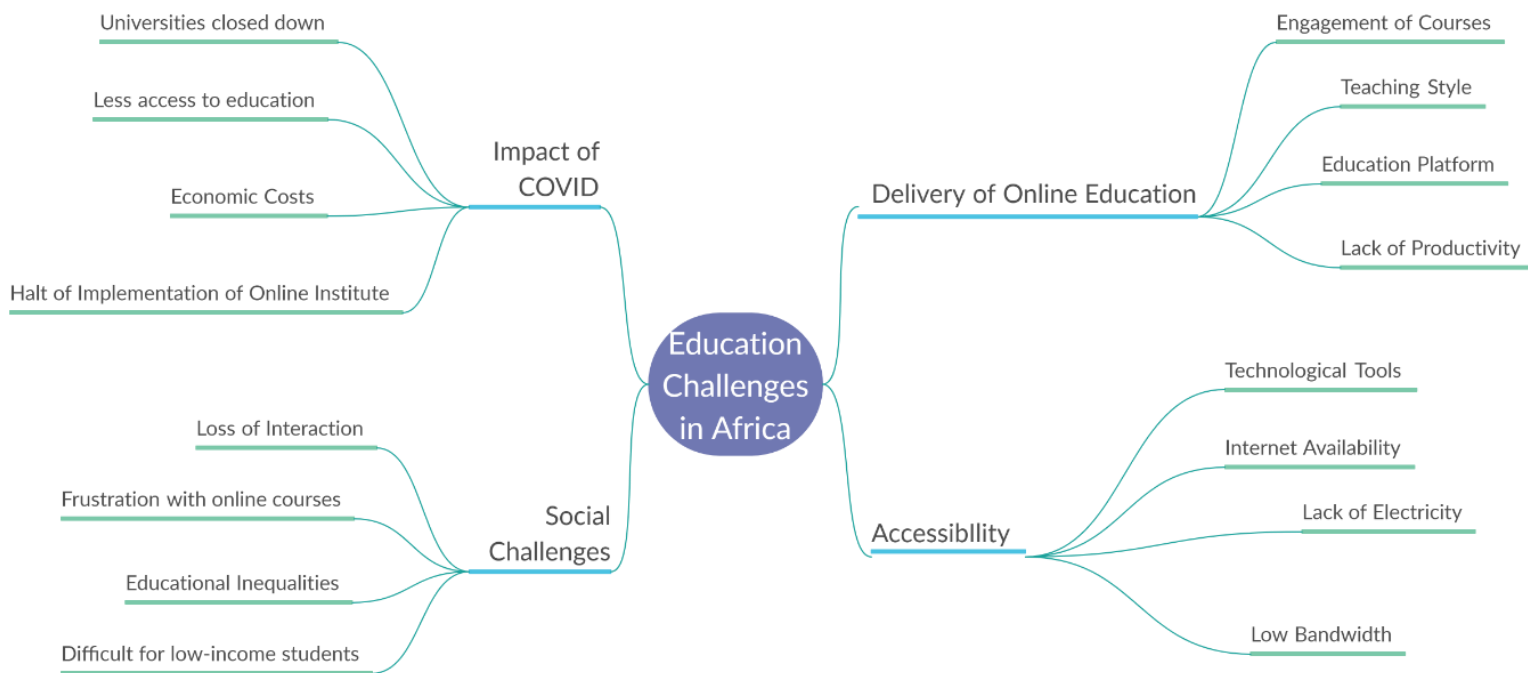


Figure 3: Educational Challenges in Africa

2.3 Website Design

A well designed website is important because it impacts how an audience views a program or company. Websites often create a first impression, so it is important that a website is designed to positively reflect the mission and goals. The design of the website should be simple so that it is easy for users to navigate through the site. It is important to keep in mind how different audiences will interact with the website so that the features of the website match its uses. (Sudhir, 2020).

A website should also use responsive design. Responsive design ensures that the website adjusts to the different screen sizes users are using. People will access the website from phones, laptops, tablets, and other devices so it is important that the website can be accessed and easily

used with various devices. Incorporating responsive design into a website is very important because today people are spending more time browsing websites on their mobile phones than on desktop computers (Sudhir, 2020).

Visual elements are also an important aspect of website design. Pages that include photos and graphics are more interesting than those without. The photos included in the website should be relevant and should be placed throughout the text to maintain user engagement. Videos are also an important component of website design. Websites with videos are 53 times more likely to end up on the first page of Google search results. The reason for this is because people spend more time on sites watching videos than reading through content (Sudhir, 2020). Many people scan websites as opposed to reading all the words, so creating a page that is easy to grab information from is key (Prabhu, T, N, 2020). Using contrasting colors and highlighting or bolding select text is an easy way to make sure important information is seen.

Additionally, a good website is equipped to handle errors and updates often. If the site is continuously crashing or uploading slowly, a user will look for a different website that is running more efficiently instead of trying to load a slow page (Singh, K, 2013). Finally, keeping the website up to date is one of the best things that can be done to help the user. Having old information mixed in with the new information will be confusing and not productive to the program. Updated content is essential.

2.4 The Online Institute

The Online Institute was launched in July of 2020 in response to the educational emergency caused by the global Covid-19 pandemic. Professor Joseph Doiron is the main source of information regarding work done by the Online Institute. He is a Global Studies assistant professor at WPI, a director and co-director of several project centers, and an organizer of the

Online Institute. The Online Institute is a program that helps institutions in Africa adapt to online learning due to the COVID-19 pandemic. The program is designed to guide and assist different universities find the best solutions for their students. The goal is to spread the knowledge WPI has learned while adapting to remote learning while still promoting independent thinking and problem solving for each university. The Online Institute process consists of three phases which are shown in Figure 4.

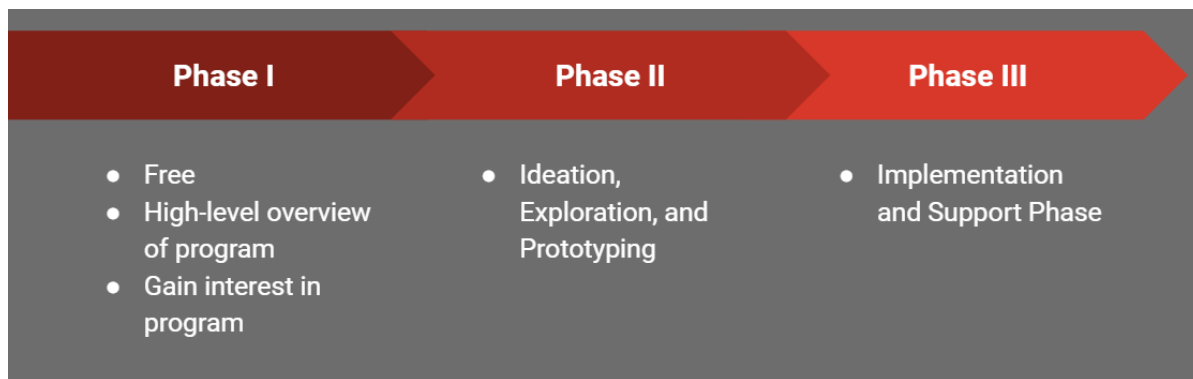


Figure 4: Education Delivery Phases

Phase I was free and designed to reach as many individuals as possible. The main purpose of Phase I of the Online Institute was to market Phase II. Phase II was paid for by the institutions and consisted of a month of ideation, exploration, and prototyping. Phase III focused on the successful implementation of concepts created in Phase II. A future goal for the next version of the Online Institute is to scale the program to more countries and continents including Latin America, Central Asia, Oceania, and other locations around the world.

There were some slight difficulties with Version 1.0 that led to inefficiencies. For the Online Institute to be scaled internationally, it needs to maintain efficiency as the number of participants grows. The Qualtrics survey software was used to onboard participants, but that is

not its intended use and managing data of more participants on Qualtrics would be increasingly difficult (Joseph Doiron, Personal Communication, February 22, 2021).

There were a few general parameters for a platform that Professor Joseph Doiron and others involved with The Online Institute used for the selection process. They considered cost, bandwidth, ease of administration, scalability, and device optimization. The chosen platform must hold an abundance of participants, be easy to navigate, and allow for information to be downloaded. The software also must be supportive of the interactive online culture of other regions. There should be designated areas for interactions where a social community can be established. Overall, the hope for the future of this project is that the program content can be easily and efficiently taught to many institutions worldwide (Joseph Doiron, Personal Communication, February 22, 2021).

2.5 Summary of Background

Overall, the African higher education system faces a multitude of challenges ranging from lack of infrastructure to lack of funding. The global pandemic has only increased these challenges and made learning even more difficult by forcing students to transition to online learning. Many students in Africa lack Internet access and are unfamiliar with the current online learning tools. The Online Institute was founded to help African universities solve their problems they identified related to online learning. The Online Institute aims to work with African universities by creating a collaborative learning environment with the partner universities. As online learning is becoming more important in today's world, the Online Institute hopes to improve and expand to help even more universities succeed in implementing remote learning.

3 Methodology

3.1 Goal and Research Objectives

The goal of our project was to improve participation, communication, and organization of the Online Institute so that it can help guide African institutions to create remote learning capabilities for their students. To achieve this goal, our team formed the following research objectives:

1. Research best website design practices and evaluate similar educational website designs to decide the best design for the Online Institute website.
2. Conduct interviews to determine the necessary website content.
3. Design and implement a website prototype that will be beneficial to both the program participants and program leaders.
4. Analyze Online Institute data to create a set of recommendations to improve the program.

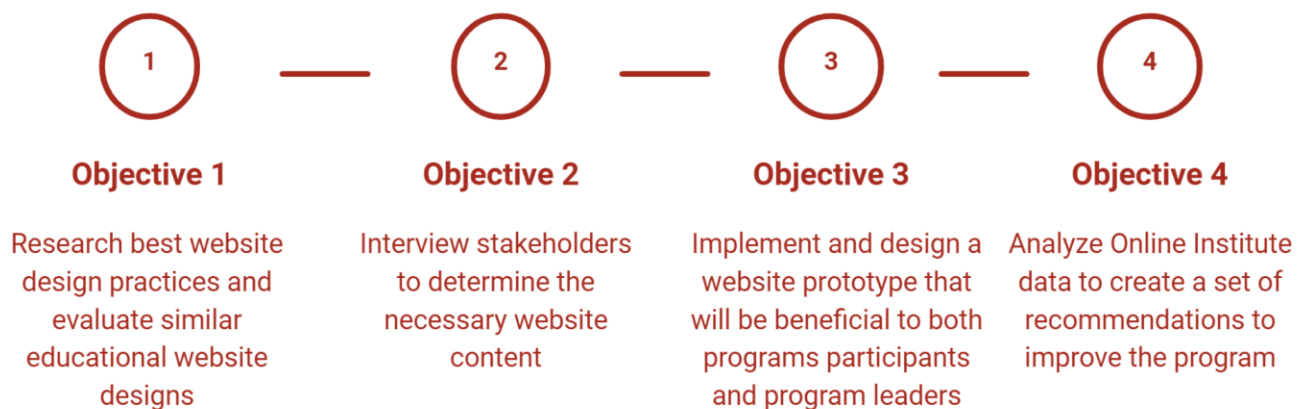


Figure 5: Research Objectives

Figure 6 below shows an overview of the research methods timeline our team followed to accomplish the project's research objectives.

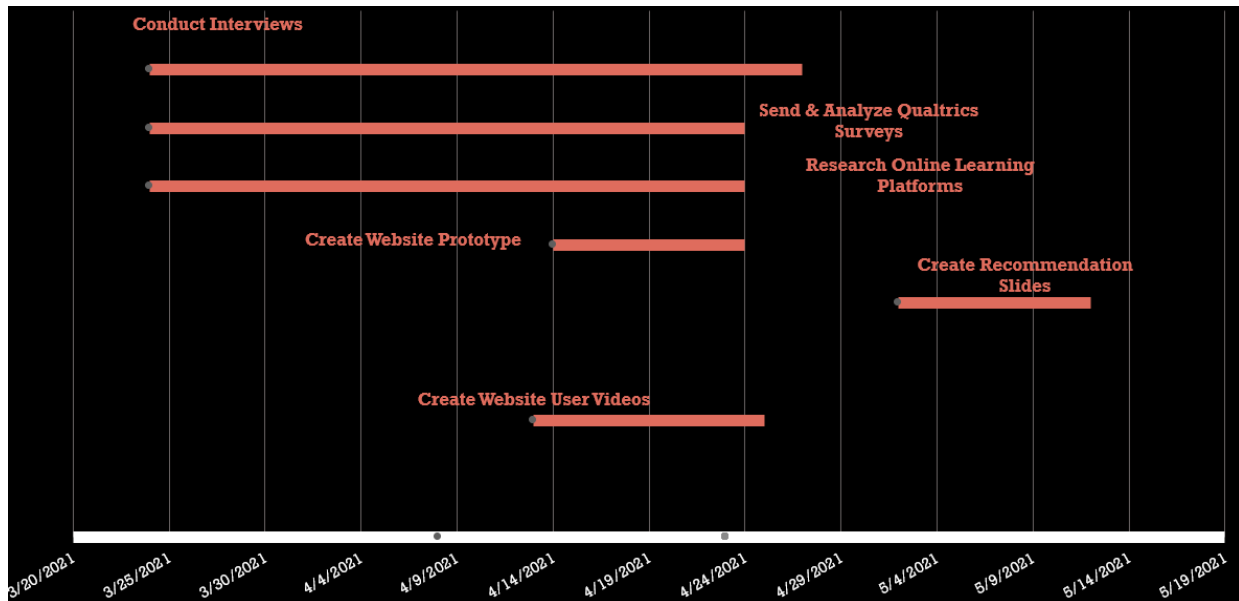


Figure 6: Project Gantt Chart

3.2 Objective 1: Research Best Website Design Practices and Educational Websites

The purpose of this objective was to understand the best practices of website design to create a well-designed website for the Online Institute. Our team researched information pertaining to the best practices of website design. Good website design is very important to a company or program's success. We sought information on website design backed by scientific studies for the purpose of developing a successful website. A study done by Google in 2012 found that well-designed websites are more likely to be perceived as credible (Tuch et al., 1970). Our team evaluated three educational websites to note the good design features of each website. The websites we evaluated are the PES University website, Manipal University website, and the American School of Bombay website. Our team chose to study these three websites because they

were cited as excellent educational website designs in Nithya Sudhir's article, *7 Wonderful Educational Website Designs for Inspiration*. For each website our team evaluated, we kept notes of design features we found effective. Our team wanted to ensure that the Online Institute contained favorable design aspects that have been proven successful.

3.3 Objective 2: Conduct Interviews to Determine Website Content

The purpose of this objective was to determine the information that was important to include on the Online Institute website. Joel Klette, a conversion copywriter, and consultant to SaaS and B2B clients, used a process of finding and writing answers which allowed him to double the conversion rates on Hubspot landing pages. This showed that including the information helpful to the website users can greatly increase the popularity of the site (Klettke, J., 2017). The purpose of the Online Institute website is to act as a centralized location that will contain all relevant information. Our team interviewed Online Institute organizers Ms. Carrie West and Professor Doiron, WPI data management experts Siamak Najafi and Ermal Toto, event speaker Mr. Michael Ahern, and Provost Soboyejo to gain an understanding from various perspectives on the necessary content for the Online Institute website.

We interviewed Carrie West to determine the most beneficial content for the website from the perspective of an Online Institute organizer. Our team asked Ms. West questions such as what the onboarding process was like and how she viewed a website serving to facilitate this process. Ms. Carrie West did much of the previous onboarding manually, so we chose to interview her on these topics. The full set of questions can be found in Appendix A.

To further understand how to develop a registration feature for the website our team conducted an interview with Siamak Najafi and Ermal Toto. The purpose of the interview was to

learn how to set up and implement a registration process, so a set of instructions to accomplish this could be presented to the Online Institute organizers and implemented in the future.

Our team also interviewed Professor Joseph Doiron to determine the necessary content of the website. Professor Doiron hosted many Online Institute events, so we asked him questions pertaining to how he views a website to maximize the program's success. Professor Doiron has worked closely with many participants of the Online Institute so we also asked for input on website features that would be helpful to the program participants since they were difficult to contact. The list of questions our team asked during this interview can be found in Appendix B.

In addition, our team wanted to understand how a website could be used to help event speakers prepare for their presentation and how a website could be used to recruit additional speakers to present. To accomplish this, our team interviewed Mr. Michael Ahern, an Online Institute event speaker. Our team asked him questions such as what information he believes would be helpful for future event speakers and how he viewed a website being used to recruit future event speakers. The full list of interview questions our team asked Mike Ahern can be found in Appendix C.

We also spoke with Provost Soboyejo who was previously a leader of an African higher education institution. Our team asked Provost Soboyejo questions such as how he thought we could improve program participation and what he thought we should include on the website to do this. The full interview questions can be found in Appendix D.

3.4 Objective 3: Design a Website Prototype

The purpose of this objective was to design and implement a working prototype website for the Online Institute that will be beneficial to participants and program leaders. This objective builds

off of Objectives 1 and 2. After gathering and analyzing website design and content data, our team used that knowledge to design the Online Institute website prototype. To develop a prototype of a website, our team evaluated various website builders such as Wix.com and Weebly. Ultimately, our team chose to use Weebly because it allowed for our team to work simultaneously on different pages of the website.

Our team evaluated the success of the website prototype by creating a Qualtrics survey asking for feedback about the website prototype we created. The survey included a link to the website prototype and asked questions such as, “How easy was it to navigate the website?” and “Was the website content useful?”. The Qualtrics survey was sent to the students and advisors of the Namibia IQP project group, the Online Institute WPI leaders, friends, family, and a few selected program participants. The full Qualtrics survey can be found in Appendix E.

To make the website successful, our team needed to consider all the different demographics who will be using it. Program participants, event speakers, African institution leaders, WPI faculty, and people interested in joining the program, all have different uses for the website.

3.5 Objective 4: Create Recommendations to Improve the Online Institute

The purpose of this objective was to develop a set of organized recommendations for ways to improve the Online Institute which our team presented to the organizers of the program at the end of our project. Our team investigated how to maximize productive participation, how to improve communication between WPI and the African partners, and how to best use various online learning platforms. Our team distributed surveys, attended live Phase III events, and conducted interviews to accomplish this objective.

3.5.1 Analyze Survey Feedback on Online Institute

Our team created an eight question Qualtrics survey that was distributed to Phase III participants to gather their feedback on the Online Institute. Our team sent the survey to Ms. Carrie West who then sent the survey to the African partners. Our team decided to have her distribute the survey because she already has established a relationship with the participants, so we speculated that our survey may generate more responses if it came from her. The questions varied from a multiple choice ranking system to open ended to allow the participants to state their opinions. Some sample questions included in the survey are, “How engaging did you find the Online Institute program?” and “What form of communication do you prefer, Slack or email?”. Our team’s purpose for sending the survey was to gather feedback from the participants and then be able to work with them to help develop localized solutions that meet their needs. A sample of the Qualtrics survey sent to the participants can be found in Appendix F.

3.5.2 Analyze Live Phase III Events

By attending the online live Phase III events our team learned first hand the challenges facing the Online Institute. During the Phase III events our team attended both the Zoom session and YouTube live session so we could monitor the attendance and chat participation on both forums. Each host runs each event differently, so analyzing the participation results of each event has allowed us to make informed recommendations to increase event participation.

3.5.3 Decision Matrix for Online Platforms

One of the main considerations for improving the Online Institute was choosing the best combination of online learning platforms. The online education platforms we evaluated are Slack, Canvas, Google Classroom, YouTube, Twitch, and Zoom. We evaluated these platforms

in terms of which platform will work best in combination with a website. When exploring options for Version 1.0, the WPI Online Institute organizers used five main software considerations that our team used again for the design of Version 2.0 along with some additional considerations. We show our main software considerations below in Figure 7. We created a decision matrix to evaluate the cost, bandwidth, ease of administration, device optimization, familiarity, scalability, and compatibility with a website. Our team ranked each online education platform in terms of each of the above mentioned categories by scoring each category with either a +1, 0, or -1. A positive score indicated that a platform met the needs of the category, a 0 was a neutral score, and -1 score signified that the platform did not meet the needs of a category. Our team weighted each category based on our research and conversations with the Online Institute leaders, then totaled up the score for each platform to determine which platform had the highest ranking. We then were able to determine the most effective platform combinations based on these scores.

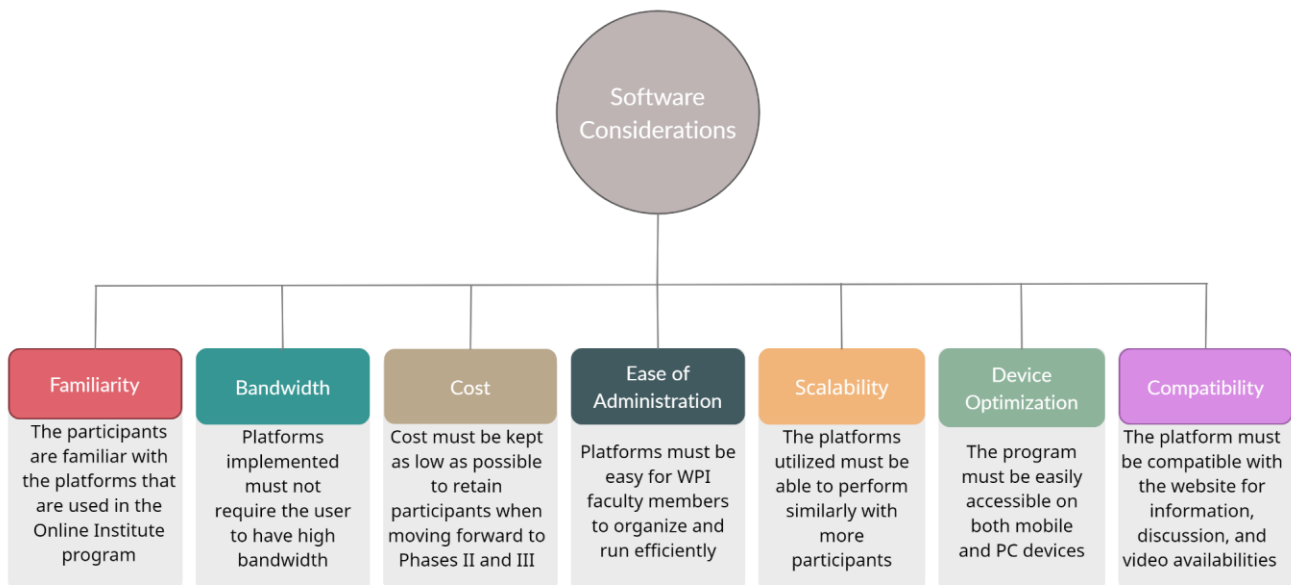


Figure 7: Software Considerations

3.6 Summary of Methods

Overall, we used a combined methods approach of analyzing survey results, conducting interviews and research, and attending live Phase III events. The purpose of the surveys sent to the past participants was to gain feedback on the Online Institute program to learn how to make the program more engaging. The aim of the website survey was to provide our team with feedback on our website design. The purpose of conducting various interviews was to help our team create content for the website that is useful to a variety of different audiences. The intention for our research on website design best practices was to create an easily navigable website and the reason for conducting research on online learning platforms was to determine the most useful combination of platforms for the Online Institute. Lastly, our method of attending and analyzing live Phase III events was to help our team determine tactics to improve event participation.

4 Findings

To fulfill each of our research objectives, we conducted interviews, distributed surveys, researched website design and online learning platforms, and analyzed live Phase III events to generate our findings on how to best improve the Online Institute. In this chapter, we answer the following questions that parallel our objectives and are significant in forming the proper recommendations:

1. What features are important in website design for the best user experience?
2. How can we balance the appropriate information for program participants, leaders, and organizers?
3. What are important aspects for the website prototype?
4. What we should improve based on Phase III participation and how we can improve the communication between the WPI and Africian partners?

4.1 Findings on Website Design

Our team read scientific research on website design and noted the aspects of successful designs mentioned in various articles. The full notes for each of these articles can be found in Appendices A and B. Overall, our research showed that the seven website design elements most often discussed in relation to user engagement were navigation (63%), graphical representation (60%), organization (43%), content utility (37%), purpose (31%), simplicity (31%), and readability (31%) (Garett et al., 2016). We found that most popular websites have simple designs because “users no longer want glitter – they want content and service, and they want it fast” (Gehrke, 2021).

Our team chose to study the three educational websites listed in Table 1 because Sudhir cited them as excellent website designs (Sudhir, 2020). We listed the common design aspects in Table 1 to identify the appropriate features to include on our website. We also noted the unique design aspects of each website as a resource for the future improvements to the website. These unique design aspects can be found in the chart comparing the key aspects of website design in Appendix G. More design details specific to each website can be found in Appendix H. Overall, our observations showed that the features mentioned in the below table are common across the three websites.

Table 1 : Common Best Educational Website Design Features among three educational websites

	PES University	Manipal University	American School of Bombay
Well-Organized Menu	X	X	X
Detailed Footer	X	X	X
Different Font Styles	X	X	X
Drop-Down Menu	X	X	X
Relevant Images	X	X	X
Consistent Color Scheme	X	X	X
Events Collection	X	X	
Search Bar		X	X

4.2 Website Interview Findings

Previously, the Online Institute did not have a website. Instead, there was a static landing page, which was a document containing information about the program organizers, partners, and event speakers. This document can be found in Appendix I. Based on the information we gathered from the Online Institute organizers, Professor Doiron and Ms. Carrie West, there was a strong need for a website or central information location for the Online Institute. To create a website

that best fits the needs of all its users, we interviewed Online Institute organizer Carrie West, WPI data management experts Siamak Najafi and Ermal Toto, Online Institute organizer Professor Joseph Doiron, event speaker of Online Education for Industry Mike Ahern, and WPI Provost Whinston (Wole) Soboyejo.

Carrie West recommended that the website include registration information, a method of payments for invoices, a page explaining the expectations for participants, an overview of the program, event dates, and past event information in the form of recorded videos and PowerPoint slides. The full list of content Carrie West suggested to include on the website can be found in Appendix J. From our interviews with Ms. West we also determined that creating an automated registration portal was an important feature to implement on the website. To learn how to do this we contacted WPI data management experts Siamak Najafi and Ermal Toto.

Mr. Najafi and Mr. Toto described to us that the first step we needed to complete to set up an automated registration portal was determining a domain name for the Online Institute which needed to be approved by the WPI marketing team. Mr. Toto created a secure WPI WordPress site for us to use. We then transferred the content from our Weebly prototype to the secure WordPress site where a registration portal would be safe to implement. The full notes from our interview with Mr. Najafi and Mr. Toto can be found in Appendix K.

Our team also learned about the website content from our sponsor and Online Institute organizer, Professor Doiron. Together we collaborated on deciding content for the website as shown in Figure 8.



Figure 8: Website Contents

He provided us with background information regarding the goals of the Online Institute and an overview of each stage to be included on the about page. The notes from the interview with Professor Doiron regarding website content can be found in Appendix B.

Our interview with Phase III event speaker, Michael Ahern, provided our team with an understanding of important website content from the perspective of an event speaker. He told us that the website should contain an events page where participant expectations for each event and a brief description of each event can be found. This page should also have an explanation of whether each event was intended to be an open discussion with dialogue throughout or a lecture style presentation. Our interview with Michael Ahern took place before his Online Industry event. Our team was able to suggest to him to email the participants to let them know the nature of his presentation - that he was expecting it to be a more conversational event rather than a lecture. This email may have helped increase participation during his event because participation was higher than the previous event, for which did not send a reminder. The event before Mr. Ahern's had absolutely no participation from the audience while Mr. Ahern's event had one participant share a prepared presentation. The notes from our interview with Michael Ahern can be found in Appendix C.

We also gathered findings related to the Online Institute website content from our interview with Provost Soboyejo. Our notes can be found in Appendix L. The Provost provided our team with reminders to understand differences between the African partners' work culture and American work culture. One difference he mentioned was the need to have a space solely for socializing before starting work. From this our team considered implementing an interactive component to the website such as a discussion board. The Provost also provided our team with website content ideas such as including examples of deliverables from universities (with their consent) on the website. The Online Institute does not require the submission of deliverables but deliverables are recommended by Online Institute leaders to help the universities implement their online learning strategies. Examples of deliverables such as past presentations could be helpful for other universities to view and may encourage them to submit their own deliverables.

4.3 Website Prototype Findings

Our team created our first website prototype using the free version of the online website builder Weebly. Our team then transitioned the content and features from the Weebly website prototype to a WordPress site that has the same main content as the Weebly site, but is more secure and meets HTTPS standards. The survey results below are based on feedback from the Weebly site and our team used the input from these survey results to improve the WordPress site.

To assess the design and content of the Online Institute website prototype, our team sent a survey to our fellow IQP Namibia cohort members, friends, and family to ask questions regarding the website design. Our team sent a separate survey to Online Institute participants selected by Carrie West to assess the website content as well as the ease of navigation. Our team received 34 responses from WPI students, friends and family, and 1 response from an Online

Institute organizer. Our team wanted to gauge which device most respondents viewed the website from. Figure 9 below shows the results of this question. This information is important because the website must be compatible with all interfaces, as most of the African participants use their mobile devices to participate in the program. To have the website function well on all platforms was important so the hosts who mostly use a laptop or desktop will have the same experience as the participants who might be using their cell phones.

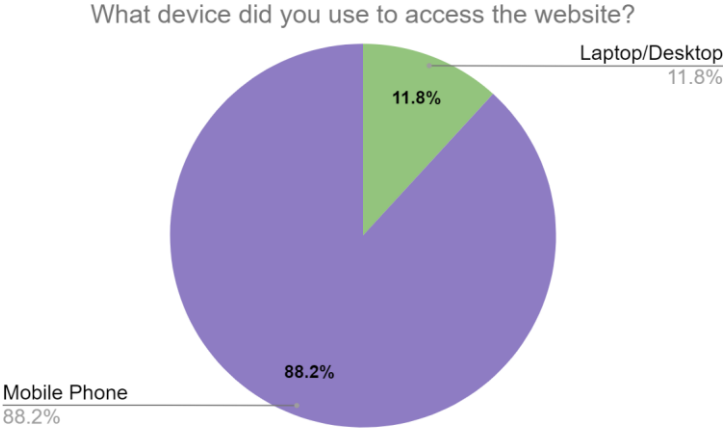


Figure 9: Survey responses to the question: “What device did you use to access the website?”

We asked WPI students, friends, and family “How was the quality?”. This question specifically asked about the quality of the overall website design and the functionality of the website from a laptop versus a mobile phone. Based on the responses received from the survey shown in Figure 10, we confirmed that both laptops and phones showed good website quality.

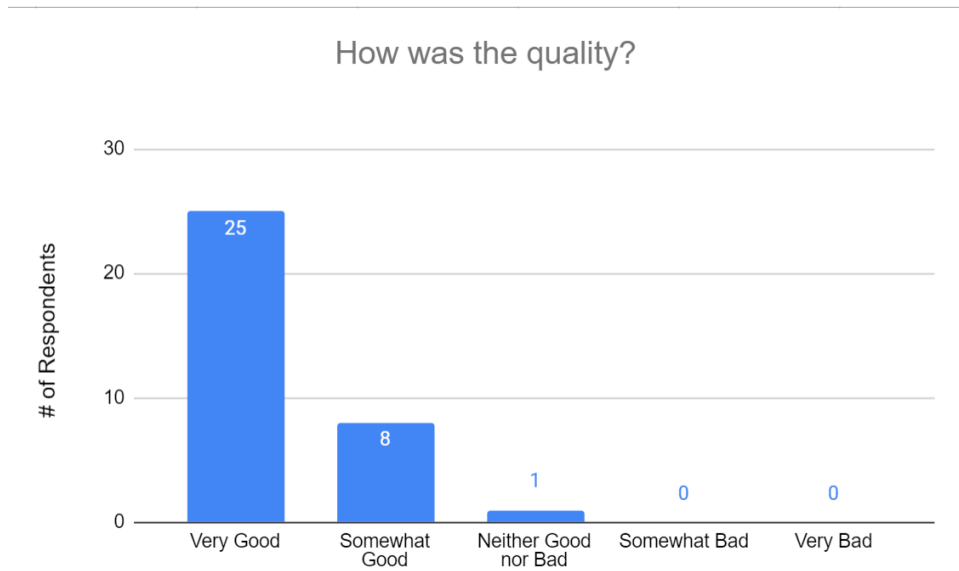


Figure 10: Survey responses to the question: “How was the quality?”

Another question we asked WPI students, friends, and family was “Was the website easy to navigate?”. The results displayed an overall positive feedback as shown in Figure 11.

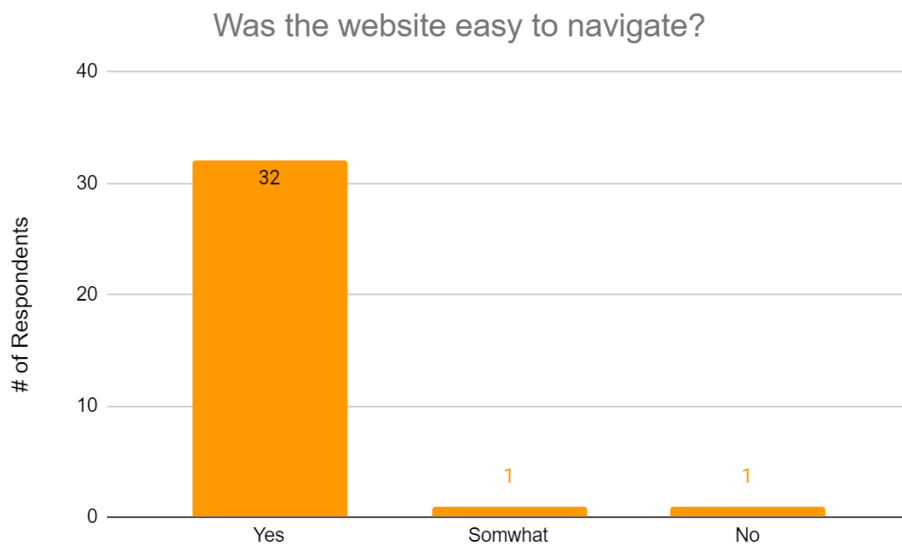


Figure 11: Survey responses to the question: “Was the website easy to navigate?”

To further determine the simplicity of our website navigation, we asked survey respondents to find the Online Institute organizers on the website. Overall the data in Figure 12 below showed high ease of navigation.

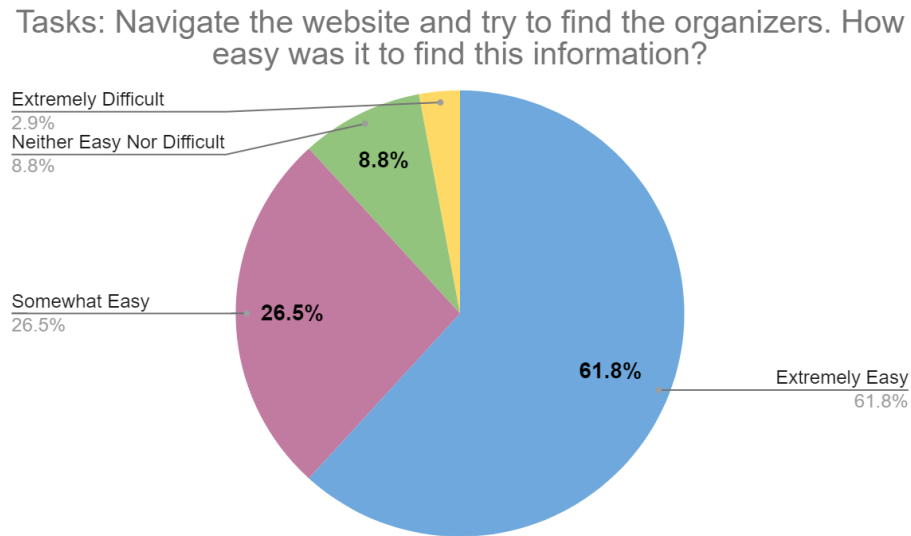


Figure 12: Survey responses to the navigation task question

The results of the questions shown above allowed our team to conclude that the website was easy to navigate on different devices. The questions from the Qualtrics survey on the Weebly website can be found in Appendix E . These survey results are significant because it solidified to our team that our website is beneficial to this program. The positive and critical responses helped us make meaningful changes to the prototype. We predict that since the website was easy to navigate for our peers, friends, and families that the participants in Africa will also be likely to easily navigate the site.

Through the completion of our two previous objectives, which are determining the best website design and website content, our team created several main pages for the website. The pages of the WordPress website are a homepage, events page, about page, registration page,

contact page, and program content page. The layout of the Weebly website prototype is very similar to the layout of the WordPress pages. The main difference between the two is that the WordPress page includes a separate program content page that contains the recorded presentations from Phase I while the Weebly website has this information stored on the events page. Our team decided to implement this change due to the feedback we received from our sponsor, Professor Doiron. The Weebly website prototype layout can be viewed in Appendix L and the WordPress website can be viewed in Appendix M. A description of each page of the WordPress site can be viewed below:

Home: The homepage contains a mission statement of the Online Institute and a brief description of each of its phases to generate interest in the program.

Events: The events page contains a calendar page which in the future will contain links to the live and recorded events. The calendar page will also include descriptions of each event and the event's speaker. The calendar page should help all parties involved in the Online Institute stay organized and improve attendance. The events page also serves as a place where the participant participation expectation will be set so that the participants come adequately prepared for each event.

About: The about page contains a detailed description of the phases, a goal statement, and background information of the Online Institute creators.

Contact: The contact page contains the contact information of Professor Doiron so that people can easily get in contact with him if a question arises or someone would like to join the program.

Registration: The registration page contains information about the registration process with steps on how to register.

Program Content: This page contains the recorded presentations from YouTube of the past events. The Phase I event videos are open to the public, but the Phase II and III videos will require a login in the future to access.

4.4 Research Findings for the Online Institute Set of Recommendations

We found that the main areas for improvement of the Online Institute program were increasing participation and improving communication and organization.

4.4.1 Survey Feedback from Program Participants

The findings from our Qualtrics survey about the overall participant impression of the Online Institute generated mostly positive results. For example, one question of the survey was “How engaging was Phase III of the program to you?”. The Figure 13 below shows that most people found the program engaging, which was surprising to us because many people did not participate during Phase III events. From our conversations with the Provost and Online Institute organizers the politeness we observed in our survey results may be due to cultural differences. Despite the results being overwhelmingly positive, the survey still gave our team insight into aspects of the program that need improvement. Based on the results to the question mentioned above, our team made suggestions to the Online Institute leaders on ways to remind participants of expectations and ways to make participants feel more comfortable participating.

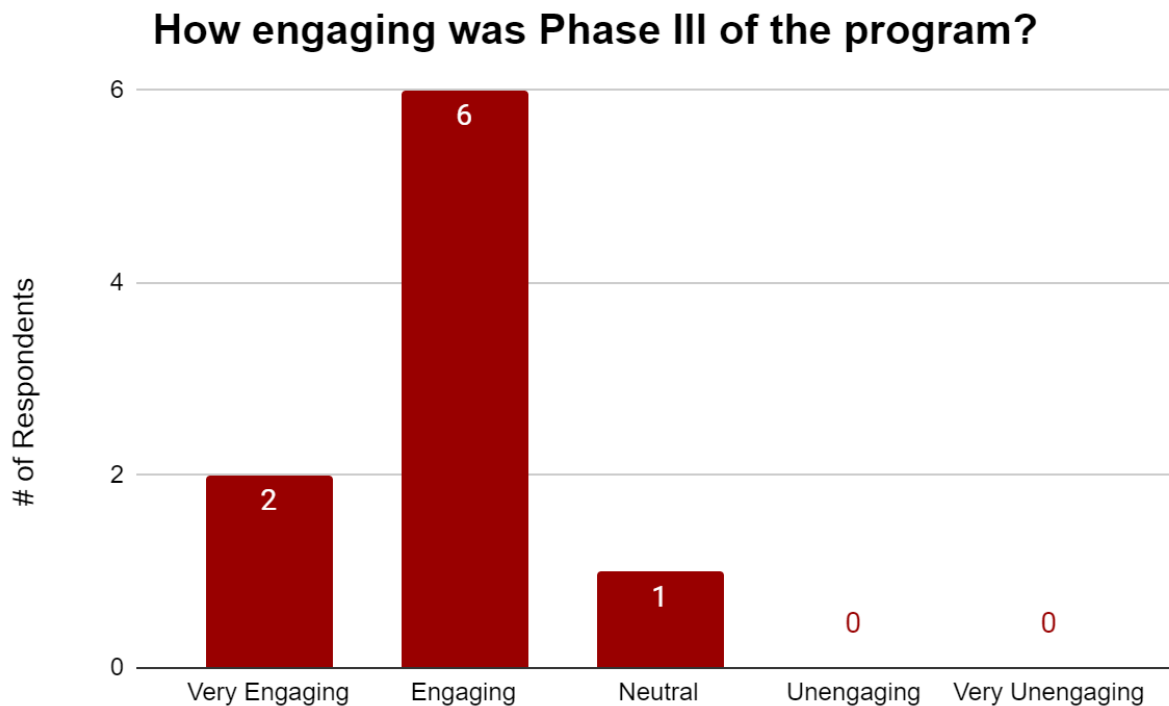


Figure 13: Survey responses to the question “How engaging was Phase III of the program?”

Our survey also included the question, “What would make you feel more comfortable in engaging or participating in Phase III events? (Zoom breakout rooms, prepared presentations, etc.)”. Most participants responded that they would feel more comfortable participating if breakout rooms in Zoom were utilized more and if they were given notice in advance to prepare a presentation.

Another question in the survey was “Did the program meet your expectations? Is there anything else you had hoped to achieve as part of this program?”. Again, the results were mainly very positive, but some results did provide helpful insight into some improvements that could be made in future versions of the Online Institute. One survey respondent responded to this question with “I had hoped it would be more reflective of the typical African milieu”. This response

shows that in the future, more efforts can be made to make the program more relevant to African culture. This finding allowed our team to make recommendations aimed at achieving this which are described in the recommendations section.

Lastly, the survey showed that all participants preferred email as opposed to Slack as a form of communication. This result shows that sending email reminders about upcoming results rather than Slack announcements may be more beneficial. From the responses to this question our team was able to make informed recommendations about the form of communication used by the Online Institute. The full survey results can be found in Appendix N.

4.4.2 Live Phase III Event

Our team attended three live Phase III events to determine ways to improve event participation. The first event was very challenging for the presenters as they received no participation from the participants. When prompted to talk about their experiences, none of the participants tried to communicate or share what they had learned through their own work. The Phase III events are meant to be a discussion between the event speakers and participants, but due to the lack of participation presenters ended up having to switch to more of a lecture style similar to the style of Phase II events.

Prior to the next Phase III event, we spoke with Mike Ahern. Through this discussion we warned him of the low participation and encouraged him to remind the participants of the event participation expectations. Sending an email reminder worked well for the second Phase III event we attended. There was a participant who prepared a short Powerpoint presentation and started a conversation with Mr. Ahern and some fellow participants. It was good progress from the

previous event and this solidified to us that if the African partners were given advanced notice, they would be more likely to participate. This interview can be found in Appendix C.

4.4.3 Research of Online Platforms

Our team conducted research on six potential technological platforms used for communication and live lectures for the Online Institute. As shown below in Table 2, the factors we focused on were cost, bandwidth, ease of administration, and scalability. Detailed research of the online learning platforms can be found in Appendix O.

Table 2: Attributes of Potential Technological Platforms

	<i>Cost</i>	<i>Bandwidth</i>	<i>Ease of Administration</i>	<i>Scalability</i>
Slack	Simplified Slack is free Slack Plus: \$12.50/annual, \$15.00/monthly	Voice Call:2 participants - 600 kbps5+ participants - 5 Mbps	Very organized, potential for subsections, easy to use once implemented	Can be used with large populations efficiently
Canvas	Dependent on users, training, support and other factors	Created to accommodate low bandwidth environments, minimum 512 kbps	Easy implementation & navigation, organized, subsections	Potential to be scaled greatly, amount of users dependent on cost
Google Classroom	Dependent on Plan:1. Teaching/Learn -\$4/month2. Workspace Plus-\$50/yr	Outbound: 3.2 mbpsInbound: 2.6 mbps (2 users)4.0 mbps (10 users)	Easily accessible & customizable, navigable, easy implementation	Can be used with large populations efficiently
Zoom	Dependent on # of Users:1. Host 100 users - \$149.90/yr2. Host 300 users - \$199.90/yr	1:1 Video Calling: high quality 600 kbps, Group Video: high quality 1.0Mbps/600kbps	Easy to host meeting rooms, different access codes for room for organization	Potential to be scaled, dependent on amount of users/hosts (max 300/room)
Twitch	Free	Maximum bitrate of 6000 kbps, but can function with lower	Easy to use once implemented, follower based system, allows moderators for organization	Potential to be scaled greatly, no maximum of participants watching live stream
YouTube	Free	Internet connection w/ 500 + Kbps	Easy to view, post, and host live/recorded videos, organized, possibility for moderators	Potential to be scaled, unlimited # of viewers, no restrictions of # of posted videos

4.4.4 Decision Matrix for Online Platforms in Combination with a Website

Our team concluded that a website would serve as a simple, centralized source of information pertaining to the Online Institute, but another educational platform was needed for quick announcements and communication. Platforms that offer important supplemental services such as messaging and video calls offer good compatibility, while platforms with an informational focus can be redundant when combined with a website. We created a decision matrix to determine which online education platform would be most useful in combination with a website. The six online education platforms our team evaluated are Zoom, YouTube, Twitch, Canvas, Google Classroom, and Slack. We created a matrix with various categories that we ranked based on our knowledge from meetings with Online Institute leaders. We used the decision matrix shown in Table 3 below to determine the best online education platform.

Table 3: Decision matrix for choosing online education platform in combination with website

Criterion	Weight	Communication			Live Stream/Video		
		Canvas	Google Classroom	Slack	YouTube	Twitch	Zoom
Compatibility with Website	5	-1	-1	1	0	1	1
Bandwidth	4	1	0	1	-1	-1	-1
Cost	2	0	1	-1	0	1	0
Ease of Administration	3	0	0	1	1	-1	1
Device Optimization	2	1	1	1	1	1	1
Scalability	4	0	1	1	1	1	-1
Familiarity	3	-1	0	1	1	-1	1
Totals	--	-2	3	19	8	3	5

Based on the results from the decision matrix the highest scoring platforms were Slack, Zoom, and YouTube. Our team took into consideration discussion based and live stream based applications to determine that Slack, Zoom, and YouTube are the most ideal options for online educational platforms. Overall, Slack scored the highest because it satisfied many of the

categories. Slack is highly compatible with the website because Slack compliments the website by adding an easy form of communication, while the website serves as a central location to access information. Canvas and Google Classroom scored low in the category of website compatibility because they have functions similar to a website without providing an effective form of messaging like Slack. Slack also has low bandwidth and cost resulting in high scores in the decision matrix for these categories. Additionally, Slack scored high in the categories of ease of administration, device optimization, scalability, and familiarity. Slack is currently being used by the Online Institute so participants are familiar with the tool. Ease of administration received a high score due to the participants and organizers experience, but Slack training videos could help improve ease of administration as well. Our recommendations regarding the improvement of technological platforms can be found in Chapter 5 of the report, Conclusions & Recommendations.

Zoom and YouTube scored the next highest on the decision matrix due to the participants' familiarity with the platform, ease of administration, and device optimization. Twitch has more similar functions to Zoom and YouTube, but Twitch scored lower in the matrix due to the participants and Online Institute's leaders' unfamiliarity with the tool making it more difficult to use and time-consuming to learn and administer. YouTube received a slightly higher score than Zoom because YouTube allows for an unlimited number of viewers, while Zoom has a limit of 100 participants or 1,000 participants with the Large Meeting add-on . However, the results of the decision matrix indicate that both YouTube and Zoom are excellent video streaming online platforms that can be used as online education tools. Overall, the combination of the tools Slack, YouTube, and Zoom work well to provide Online Institute participants with all the needed capabilities.

4.4.5 Online Participation Tactics

Our findings from the interviews and surveys suggested that identifying team leaders, utilizing Zoom breakout rooms and discussion boards are potential ways to increase engagement. Below we have explained briefly, our reasoning for implementing these ideas based on the data we gathered.

Team Leaders. The team leader concept facilitates participation by eliminating the personnel and attendance variables. Each institution sends one or two members who are prepared to share updates and additional thoughts. This way, members who would like to watch can view the event on YouTube. Our team leaders will have a specific purpose at meetings and will be more inclined to participate.

Breakout Rooms. A continuation of the team leader concept is the use of breakout rooms. During events, team leaders and WPI speakers would be placed in breakout rooms to discuss progress and problems in smaller groups. Ideally, this will contribute to increased participation and conserve valuable event time with all the participants.

Discussion Boards. Discussion boards can facilitate communication outside of events. Whether in Slack or on the new website, they could make participants more informed before and after the events and more comfortable sharing progress and updates.

4.5 Summary

By analyzing the information gathered from our interviews, surveys, live event attendance, and research, we developed findings concerning the success of the Online Institute program. Our results from our interviews and surveys with program participants showed that many participants

find Zoom breakout rooms more engaging, email is the unanimously preferred form of communication by all respondents, and that the website prototype is easily navigable. Our qualitative results from interviews with the Online Institute program leaders highlighted the need for an Online Institute website and the lack of a central location for all information about the Online Institute. Our team used the findings presented in this chapter to develop recommendations for the improvement of the Online Institute.

5 Conclusions & Recommendations

The Online Institute teaches universities valuable techniques that can lead to the implementation of their own online education program. The Online Institute program shows great potential for helping many higher education institutions across the world develop their own online education programs. The expansion of e-learning is increasingly important as the world continues to become more digitally focused. By researching successful online delivery techniques, conducting interviews with a diverse audience, and analyzing data, our project team was able to develop various findings, create deliverables for our sponsor, and suggest recommendations relevant in the near term, as well as in the longer term.

5.1 Summary of Findings

5.1.1 Website Design Findings

The findings we gathered from our website design research is that our website should have a simple design, use a consistent color scheme, use the same font style throughout, incorporate relevant images, and be mobile friendly.

5.1.2 Website Content Findings

Based on the findings from our interviews we were able to determine important content to include on our website for the Online Institute. We found that it should contain a homepage with a mission statement, a contact page, a registration page to sign up for the program, an events page with information about upcoming events, a program content page with videos of past recorded events, and an about page with an in-depth explanation of the program.

5.1.3 Website Prototype Findings

Based on our Weebly survey results we found that most respondents found our website design to be easy to navigate. The positive feedback on our prototype prompted our team to transfer similar content and design to an official WPI WordPress website. With the help of Mr. Toto, we created a WordPress site because it is safer to implement a registration portal in the future.

5.1.4 Participation and Communication Findings

Our research findings showed that the main areas of improvement for the Online Institute are increasing event participation and improving communication between WPI and the African partners. We found from attending live events that participation at events varied but was relatively low compared to Phase I and II events. We found that sending a reminder email to participants about the expectations of the event can help increase participation. Mr. Ahern reminded participants of the open discussion format of his event and experienced a higher level of participation compared to the previous Phase III event that did not send a reminder. Our survey results showed that all respondents preferred email over Slack as a form of communication. Additionally, our interviews with Professor Doirion showed our team the difficulties some participants had with using and setting up Slack.

5.2 Deliverables

The deliverables for our project include a WordPress Online Institute website, a website demo video, and a set of recommendation slides we presented to our sponsor. The WordPress website is designed with a simple structure and contains the free content from Phase I. Screenshots of our WordPress website are in Appendix M. Our team has provided our sponsor with editing access to the WordPress website so he can make updates in the future. The demo video is a short

explanation of how to navigate the website and the purpose of each page. The Online Institute organizers may present the video to the program participants to help familiarize them with the new site. Finally, our slides clearly state our recommendations for how to increase live event participation, enhance communication, and improve organization. The slides provide a brief description of each recommendation, our reasoning for why we chose each of our recommendations, and steps to implement. For example, we provide our sponsor with steps to implement a registration portal on the website.

5.3 Recommendations for the Near Future

Based on our findings, our team developed a set of recommendations to be implemented in the near future to increase event participation, improve communication, better utilize online video platforms, and improve the website we designed.

1. Increasing Event Participation.

- a. Advanced Notice.** We recommend that the leaders of the Online Institute notify participants of the expectations of each event before it begins. We suggest event speakers or a WPI organizer send an email reminder to the program participants at least a day before live events explaining the format of the upcoming event. For example, describe that the upcoming event is intended to be a discussion among participants, and they will be asked to share their thoughts, or that the event will be a lecture. Our team believes that advanced notice about whether the participants will be expected to speak will help increase participation levels as they can come to the event prepared.
- b. Zoom Breakout Rooms.** Breakout rooms would allow program participants to interact with other African institutions and share their ideas. One limitation to

using breakout rooms is that discussions cannot be recorded, so those who cannot attend live events will not be able to watch. To mitigate this issue, our team recommends that breakout rooms close before the end of the event. This way all teams can discuss the ideas they shared in each room. The event speaker can choose or have each group decide on a leader who will present their ideas to everyone once the breakout room closes. Recording and posting this discussion will allow those who could not attend the live event to be able to watch.

2. Online Communication Platforms.

- a. Slack.** Based on our research, we recommend the continuation of Slack as a communication platform. Slack requires very little bandwidth and is low cost making it an ideal option for the Online Institute. Based on our interviews with the program organizers, we found the initial navigation of Slack for the participants to be difficult. To address this problem, we recommend that the WPI organizers host an informational session on Slack. The session should review how to sign up, how to join channels, and the intended purpose of the specific channels in the Online Institute workspace. The Slack informational session should be equipped with multiple instructors to ensure all participants' questions will be answered. We also recommend that the tutorial be emailed to all participants so they may refer to the video later.
- b. Email.** We recommend that emails in addition to Slack messages be sent to the program participants to remind them of upcoming events and what is to be expected. Our interviews with Ms. Carrie West provided us with the insight that many participants may not have Slack notifications turned on and therefore miss

important reminders leading to low event attendance. Sending emails will address this problem and may lead to increased event attendance.

3. Online Video Platforms

- a. Zoom and YouTube.** Zoom is ideal for attending live events and allows for the interaction that best mimics an in-person setting. Zoom breakout rooms can be used to create smaller groups which our Qualtrics survey results show will make the program more engaging in the program participants' opinion. The limitation to Zoom is the 100 user limit or 1,000 user limit with the Large Meeting add-on. We recommend that when a large group is expected, "thought leaders" be identified among the African universities by the participants, and only they will attend the call. These "thought leaders" will speak during the Zoom call, and others can join the YouTube live session and type in the chat if they choose. Based on our discussion with Provost Soboyejo, identifying "thought leaders" (those who have strong ideas), would improve the discussion during the live video sessions. We recommend continuing to post the recordings of the live sessions for those unable to attend.

4. Website Recommendations.

- a. Website Design.** We recommend that future updates to the Online Institute comply with a similar design style as used by our team. The design should remain simple, organized, use a consistent color scheme, use the same font style, contain an organized menu, and incorporate relevant images and videos.
- b. Website Content.** We recommend continuing to add pages to the website to organize the content. The website homepage should be edited to include more

information regarding the program's mission statement and general information. The events page should be frequently updated to include information and expectations of each event on the calendar. The program content page should also be updated to include all material from recorded live events. Our team recommends that the organizers of the Online Institute encourage users to treat the website as the central location for all information about the program.

5.4 Recommendations for the Distant Future

Due to the time constraints of our project our team has made several recommendations for the continued improvement of the Online Institute by program leaders or other IQP teams in the future. Our future recommendations for the program focus on improving the website and increasing the outreach of the program. Our recommendations for the future of the website are below:

1. **Registration portal.** Our team recommends implementing a working registration portal onto the website to improve the efficiency of the registration process.
2. **Locked Phase II and Phase III Content.** Our team recommends utilizing a sign-in feature to access phase II and III content because these are the paid phases and will restrict access to only paying participants.
3. **Provide a description of video content.** We recommend providing brief descriptions of the content in each recorded video below each embedded video to make it easier for participants to find specific content.
4. **Marketing Content.** We recommend adding more informational and marketing content to the website to generate more interest in the program. Marketing content

could be in the form of promotional videos or personal success stories from past participants.

5. **FAQ Page.** We recommend creating a frequently asked questions (FAQ) page on the Online Institute website which includes common questions and answers. We recommend that one key component of the FAQ page be instructional videos on how to use Slack and that these videos be tailored specifically to the Online Institute channels so that the intended use of each channel can be explained.

Our team also recommends focusing on scaling up the Online Institute program and focusing more on the outreach of the program. Our recommendations relating to future outreach initiatives are below:

1. **Research.** We recommend conducting research into learning which additional institutions from around the world would be interested in participating in the Online Institute program. We recommend that outreach be done through personal connections if possible or by conducting research online to determine higher education institutions that lack remote learning capabilities and are interested in getting assistance in implementing their own programs.
2. **Social Media.** We recommend creating social media accounts for the Online Institute to spread the impact of the Online Institute. We recommend following the current partner African institutions and institutions the Online Institute hopes to work with in the future.
3. **Record promotional videos.** Our team recommends recording an attractive video introducing the goal of the program and the benefits of participating in the

program. We recommend conducting outreach initiatives to other countries by sending these videos to other higher education institutions to generate interest.

4. **Online Institute Email.** Our team recommends creating an Online Institute email which can be included in the contact page of the website so personal email accounts do not need to be used. We recommend the Online Institute email account be used to send promotional information. The Online Institute email can also be used to answer questions relating to the Online Institute and deliverables can be submitted to the Online Institute email to keep the content organized.

5.5 Summary of Conclusions and Recommendations

The Online Institute has proven its early success in that multiple African universities participated and completed all three phases. While the early success of the Online Institute is admirable, our team identified several areas of improvement with the help of our sponsor and others involved in the Online Institute. The Online Institute has an important mission in partnering with higher education institutions worldwide to create solutions for problems they identify relating to online education. To best assist other universities to succeed in their online education, our team developed several recommendations to improve the Online Institute program.

Our team recommends setting participation expectations and utilizing Zoom breakout rooms to increase event participation, increasing email use and creating Slack instructional tutorials to improve communication, identifying "thought leaders" for live event presentations, and utilizing the Online Institute website our team created as a central source of information. Our team recommends that the website be continuously updated to maintain the relevance of the website. In the future, our team recommends that other IQP teams or program organizers focus on developing a strategy to scale up the program. Overall, the Online Institute's mission will

continue to be important as the world progresses with online education, especially after the Covid-19 pandemic. Our team expects that our recommendations to improve the program will only serve to increase the impact the Online Institute will have on the state of online education across the world for years to come.

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Appendices

Appendix A - Carrie West Interview Questions

- Has Phase III started and if so how is going?
- What was the process of reaching out to the initial participants and what role did the NUC have?
- What sort of format do you think would be most useful in collecting data from participants? (live interviews, surveys, etc)
- How would we go about finding a contact for a possible live interview?
- Would Provost Soboyejo have time to meet with us?
- What was the biggest take-away from the first round?
- Do you know which institutions were the most involved?

Appendix B - Professor Doiron Website Content Meeting

1. Questions

- a. Why did we choose to send the website feedback survey to peers?
 - i. We want to send it to students who have the designer point of view.
 - ii. Professor Doiron recommends sending to three buckets: students, Carrie/Wole/WPI people, participants in Nigeria.
 1. Reasons being culture and uses of technology, see if we can get feedback from the individuals who will be using it.
 2. Expand to more than Bendega, maybe Ohne or other contacts, not to everyone.
 - iii. Ethan suggested two surveys, one for constructive feedback from students and one from the participants to ensure it is helpful to the program.
 - iv. Prof Doiron suggests we ask the survey individuals to do a task such as write something on a discussion board and ask questions regarding that. Could either be a survey or a live walkthrough and see individuals go through the website live.

2. Comments

- a. There was a long strike of Nigerian Higher Ed, WPI people did not know and that makes sense as to why certain groups did not produce the work. It would be interesting to look at and see if some of the participation was based on the role of the group and see if the strike was affecting what they could do; i.e: many professors were not teaching so active learning could not be practiced, and that leads to the lack of participation from these groups in the earlier phases.
- b. Prof Smith asks about Methods and report writing as the team has restructured everything, and he asks if we are sure we know what we need to know to accomplish everything we need to do.
 - i. Think through goals and actions we want the website to achieve. This will be beneficial for choosing a platform in the future. We want to design a registration tool, what are the steps people need to walk through and where that info will go. Why it is present, why the resources need to be used to build this, and why it is important.
 1. If we talk to Carrie about what was done, talk about what would be ideal for the next iteration of this. We want to figure out what an ideal state for the platform for the next iteration of the program.
 2. We should talk to Siamak Najafi for management of data, and/or Stacy Chiaramonte.
 3. Our goal should be to at least lay out the plan as implementing this in the next 3 weeks would be a challenge.
 - a. Idea: create a video to show the steps for registration, other steps like this to help move the project along after our part of the project is done. Any way to demonstrate functionality of the site is VERY valuable.
 - b. Some demo videos for the prototype going through each page would be helpful to have in addition to the prototype site, with functions that we do not have in the page that would be beneficial.
 - c. Try to find the MSR IQP website prototype as it might be helpful for us, also the namibia project group that did rural electrification project. For professional examples go to any software website for good demos.

Appendix C - Mike Ahern Interview Questions and Notes

Questions:

- How were you contacted to speak at an Online Institute event?
 - ◆ Do you have any ideas on how to recruit future speakers or how to spread awareness of the program?
- What topics do you plan on covering at your phase III event?
- What do you currently do during presentations to encourage participation?
- Do you have any other ideas to encourage participation?
 - ◆ Zoom breakout rooms, jamboards, asking participants beforehand to prepare a presentation which they will be asked to present
 - ◆ Do you have any thoughts about how we can encourage participation despite internet connectivity problems and low bandwidth?
- We are planning to build a prototype for a website for the online institute
 - ◆ Is there any information that you would like to see on the website that could be helpful for future speakers to help them prepare?

Notes:

- Phase III had two professors from Nigeria, but seemed to not have done the implementation yet, seemed like they wanted a repeat of phase II
- Curriculum in Nigeria is more structured
- Maybe there's cultural barriers holding back phase III
- Nigerian profs asked if Mike could share his email but he hasn't heard from them since
- Try to uncover what the cultural barriers are
- Nigerian faculty weren't being paid so that was why they weren't as responsive for a little, worker strike
- Graduates of Nigerian schools aren't being hired by Nigerian companies
- Mike Ahern is going to be working as a consultant
- Mike will reach out to let them know that they will be expected to speak at the event

Appendix D - Provost Interview

Questions:

- How can we improve participation among the participants?
- Through unstructured way -social media
 - Through structured way - organized interaction
 - Need to be able to control sizes of groups that allows for us to be able to control the interaction and allow interaction
 - Need institutions to talk to each other and interaction, collaborate etc
 - Comfortability will lead to more interaction during phase III events
 - Can use zoom boards/chat rooms to collect what each breakout room talks about (possible to set up subtitle script that can be saved??)
- Figure out who the thought leaders are from the different groups, bring thought leaders together into breakout rooms
 - Find that the actual leaders and the thought leaders aren't the same
 - Need a thought leader in every breakout room and an actual leader in order to improve interaction (get the ball rolling with two strong people)
- Common themes apply to different institutions
 - Important idea with bringing them together in same place is for them to exchange and talk about similar difficulties and challenges and learn from each other
 - Want to make sure what we do is helping them structure their implementation plan to something that is well informed and do able and view what other institutions are doing
 - Measure of success: enable each university to offer online programs at the end of phase 3
 - Interaction is important in order to help the institutions grow their programs
 - Need more engagement
 - Need a way to gauge status during phase iii events
 - How can we engage with them in a way that makes them feel comfortable
 - Tell them to come to meetings prepared about what they want to talk about
 - Get together, conversation flowing will be able to present
 - Ask them to present as teams
 - Instead of asking them questions unprepared give them a heads up and a chance to prepare for when they are gonna talk
 - We want them to steer the discussion
 - This will help show who is more engaged and where we can improve (resources, content, quality etc)
 - Start with the groups giving their summaries and discussion where they stand
 - Then we can offer guidance on next steps, resources, content, etc
 - Form some type of framework among groups, each group should have a spokesperson and side talking people
- Set up whatsapp site for social interaction - maybe make a group with us Carrie Joe thought leaders and group leaders
- Do you have any ideas regarding better interaction from the participants during zoom meetings, jamboards, polls etc?
 - Tell them to come to the meetings prepared to present, ask them to present as teams
 - Have them tell us what they are doing week to week and ask if they have any problems with implementation, then can give them a suggestion to help fix the problem, and ask them to come next time with updates
 - Don't start with presenting to them. Start the events with them giving their summaries.
 - Need a website
 - Need to bring leaders together first to let the leaders know what we're doing before connecting to the others.
 - Need to make it more interactive and need a way to collect this information

Appendix E - Website Prototype Qualtrics Survey

Participants Survey Questions:

- What is your name?
- What is your email?
- What institution are you a part of?
- What device are you using?
- Task: navigate the website and try to find the organizers, could you do it and was it easy to get there?
- Do you feel that the website has a good amount of information about the online institute?
- Does the website make you want to join the program/ is it engaging?
- How would you rank your experience while using this website on a scale of 1-10?
- Any suggestions?

WPI Students Survey Questions:

- What device did you use to access the website?
- How was the quality?
- Was the website easy to navigate?
- Task: navigate the website and try to find the organizers. How easy was it to find this information: Easy, Somewhat easy, Neutral, Somewhat hard, Hard
- Do you have any suggestions on the aesthetic?
- Are there missing features you wish the website had?

Appendix F- Online Institute Participant Survey Questions

- What is your name?
- What is your email?
- What is your preferred method of communication to receive information about the events?
- How easy is it to access the information about upcoming Phase III events?
- How engaging was Phase III of the program to you?
- What would make you feel more comfortable in engaging or participating in Phase III events? (Zoom breakout rooms, prepared presentations, etc.)
- Did the program meet your expectations? Is there anything else you had hoped to achieve as part of this program?
- Would you recommend this program to others?

Appendix G - Additional Educational Website Features

PES University	Manipal University	American School of Bombay
Large and eye-catching registration button	Announcement bar at the top of the website	Key links section
Quick links section	Email subscription box	Back to top button at bottom of page
Contact information at the top of the page	Links to social media located in multiple places	Informative headings that are extremely larger than the text
Video about the institution on the homepage	Slides on the homepage	Inquire section that users can input questions or concerns and get a response from someone in a few days
“Chat bot” that you can type questions to and get responses instantly		Animated images and headings that move on the page

Appendix H - Three Educational Website Design Details

The first website our team evaluated to utilize as a source of inspiration for the design of the Online Institute was the PES University website (PES University), which has a simple design and a well organized menu. It also features a green registration button in the top right hand corner of the homepage shown below.



PES University Homepage and Registration Button

Next, our team studied the Manipal University’s website. Its most catching feature was its use of “Inspired Learning” slides on the home page which acted as the structure of the entire website. The Manipal University website also featured a bright orange “Apply” button at the top of the page that stood out (Manipal Academy of Higher Education, 2020). Below is a screenshot of the homepage showing a preview of the orange apply button at the top of the page and the eye-catching slides on the home page.



Manipal Academy of Higher Education Website Homepage

The third website our team evaluated was the American School of Bombay website which included many images, videos, social media buttons, and did not include too much text (American School of Bombay, 2020). The figure below is a screenshot of the website’s homepage showing a good balance of large text and images.



American School of Bombay Website Homepage

Appendix I - Online Institute Static Landing Page

WPI Online Institute

Phase III Program

After the conclusion of Phase I this summer and Phase II this fall, Phase III will encompass several months of continued support for the university teams who have signed up to participate in the Online Institute program. The elements of the program will include a monthly series of online events and the development of an online support platform. Using these elements we will engage with subject matter experts at WPI and the team at NgREN to:

- Support teams at each university as they develop & implement solutions for online learning at their institutions
- Provide a platform for online community engagement
- Share expertise and best practices in online education
- Connect to help desk responses by NgREN staff and WPI subject matter experts.

February 11, 2021
Sun EST (2PM WAT)

ONLINE PEDAGOGY & FACULTY SUPPORT
Kris Wobbe, Chrys Demery, Sarah Stanlick & Joe Doiron

WPI Online Institute

March 4, 2021
Sun EST (2PM WAT)

ONLINE SOFTWARE, VIRTUAL TOOLS & LACS
Sia Njafif, Adiana Herr, Erica Stults, James Kingsley & Ermal Toto

March 25, 2021
Sun EST (2PM WAT)

STUDENT SUPPORT, INSTITUTIONAL & FACULTY
Deb Boucher & Katie Elmes

WPI Online Institute

April 15, 2021
Sun EST (2PM WAT)

ONLINE EDUCATION FOR INDUSTRY
Mike Aherm, Dan Wogale, Peter Vitic & Catherine Bouthlier

May 6, 2021
Sun EST (2PM WAT)

ONLINE COURSE DELIVERY
Kate Beverage, Joe Doiron & Sarah Stanlick

June, 2021
PROGRAM GRADUATION

WPI Online Institute

Meet the Organizers

Joseph Doiron, Assistant Teaching Professor, IGSD
Focus on research, design and development of new product and program experiences in the United States, Middle East, and Africa. Director of the United Arab Emirates Project Center, the Namibia Project Center, Co-Director for the Center of Global Public Safety, and Co-Founder and Co-Director of the Foisie Sandbox, a WPI Project Center that lets students earn credit for starting their own businesses.

Carrie West, Executive Assistant, Global & Special Projects
Works closely with the Provost to build collaborations with global partners and promote activities which foster innovations in K-12 education; promote interdisciplinary research and cultivate scholarship in African universities. This includes the implementation of programs such as the Center for Global Public Safety, Visiting Scholars Institute, PASET Program, COVID-19 Response in Africa, Math & Science for Sub-Saharan Africa and the Online Institute.

WPI Online Institute

NgREN Task Team

Meet the Team at NgREN who will be working to support Phase II of the Online Institute

Mrs. Onyinye Vivian Akuba
Currently the Project Management Assistant for the Africa Center of Excellence for Development Impact (ACE) Impact Project, and was a Communication Officer for the recently concluded Africa Center of Excellence (ACE) Impact Project. She is currently a Senior ICT Officer within the National Universities Commission (NUC) and a member of the Nigerian Research and Education Network (NgREN). She is also a member of the Administrative Task Team of the NgREN. She is currently a member of the NgREN Technical Team.

Uman Imam Rilwanu
Uman Imam Rilwanu is an Administrative Officer for the World Bank (WB) and a member of the Administrative Task Team of the NgREN. He is currently a member of the NgREN Technical Team and is responsible for the user interface on the Africa online Phase II interface on slack.

WPI Online Institute

Lulu Udoka
She is currently a Principal ICT Officer within the Directorate of Research, Innovation and Information Technology of the National Universities Commission (NUC) and a member of the Nigerian Research and Education Network (NgREN). She is also a member of the Administrative Task Team of the NgREN charged with the task of ensuring the seamless communication between the participants from the Nigerian Universities and the Director (Administrative Support) (AS).
Lulu is assigned the responsibility of housekeeping for the **introduction channel** throughout Phase II of the Online Institute Program on the slack platform.

Oritsedere Michael Otubu
Oritsedere Michael Otubu is currently a member of the NgREN Technical Team and is responsible for the user interface on the Africa online Phase II interface on slack.

WPI Online Institute

Adeolu Majonabe
Currently an IT support / Administrative Officer for the World Bank (WB) and a member of the Administrative Task Team of the NgREN. He is currently a member of the NgREN Technical Team and is responsible for the user interface on the Africa online Phase II interface on slack.

Ohene John
Ohene John is a Principal ICT Officer within the Directorate of Research, Innovation and Information Technology of the National Universities Commission (NUC) and a member of the Nigerian Research and Education Network (NgREN). He is currently a member of the NgREN Technical Team and is responsible for the user interface on the Africa online Phase II interface on slack.

WPI Online Institute

Abdulkarim G. Suleiman
Abdulkarim G. Suleiman is a Senior ICT Officer within the Directorate of Research, Innovation and Information Technology of the National Universities Commission (NUC) and a member of the Nigerian Research and Education Network (NgREN). He is currently a member of the NgREN Technical Team and is responsible for the user interface on the Africa online Phase II interface on slack.

Oritsedere Michael Otubu
Oritsedere Michael Otubu is currently a member of the NgREN Technical Team and is responsible for the user interface on the Africa online Phase II interface on slack.

WPI Online Institute

Simi Sophia Zang
Ms. Simi Sophia Zang is a Senior ICT Officer with the Directorate of Research, Innovation and Information Technology of the National Universities Commission (NUC) and a member of the Nigerian Research and Education Network (NgREN). She is currently a Project Management Assistant (PMA) for the Africa Center of Excellence for Development Impact (ACE Impact) Project. She has also worked on the Nigerian Research and Education Network (NgREN) Project and the Science, Technology and Education Post Basic (STEP-B) Project as a Project Officer.
She is a member of the NgREN Administrative Task Team, charged with the responsibility of housekeeping for the **introduction channel** throughout Phase II of WPI Online Content Delivery Training on the slack platform.

Oluwatobi Fowora
Oluwatobi Fowora is a Principal System Administrator working with the National Universities Commission (NUC) and the Nigerian Research and Education Network (NgREN). He is currently tasked with the responsibility of providing Technical support for the Collaboration and User Session Channels on the Africa online Phase II Sessions on slack.

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Appendix J - Carrie West Email on Website Content

Videos:

- Phase I: 5 Videos – all recorded in Joe’s YouTube account (these need to be moved to our new Africa Initiatives account)
- Phase II: Not sure how many videos were recorded but probably 10-20 – all recorded in Joe’s YouTube account (these need to be moved to our new Africa Initiatives account)
- January Report Out Event – recorded in Africa Initiatives YouTube Channel
- Phase III: 5 Videos – all recorded in Africa Initiatives YouTube Channel

These videos are saved and we’ve shared their links to our partners but they are not universally accessible in any one area (and we will need to confirm how accessible we want them to be – if it’s only for paying participants, then we need to deal with that too) Remember, Phase I was free and Phases II & III were paid for (as one unit) so that will probably dictate what is freely available and what is not. We also need to evaluate the value of these videos and whether they need to be edited or if they’re out-dated. So, we want to make sure to share material that makes the program look good, not just throw out a bunch of links to stuff just because we have it.

Presentations:

- Most of the above events included Powerpoint presentations – mostly from WPI presenters - these are not posted anywhere universally accessible.
- Some universities submitted their own slides as part of the feedback process – like we saw today. Typically Wole likes to share these things because it’s especially helpful for African universities to see what their colleagues are doing as it’s often more relatable to them. But we may need to ask them if it’s ok to share before posting them.
- There may also be other ‘deliverables’ – in PPT or DOC formats – from universities that were shared in Slack during Phase II – again, we may need to consider the appropriate audiences and permissions.

Other Materials:

- As part of running the trainings, it would be great to have a place where people can go to get information such as:
 - Information on the training
 - Overview/purpose
 - Dates
 - Costs
 - Registration access and deadlines
 - We did not have a registration process last year and that would have been a huge help to stay organized
 - I’ve since learned about Zoom registration and I know there are others used on campus but different groups

- Qualtrics can often be used as part of the registration process if we want to collect data about who is attending our programs so we can better suit their needs and target the audience
 - Requirements
 - Legal agreement that needs to be signed
 - This was all done manually last year
 - I collected the signed agreements via e-mail
 - I had to make sure that the agreements were signed by Wole and then send copies of each one to our legal office for their records as well as fully signed copies back to the participating universities
 - Method of payment for invoices
 - This was all handled manually last year
 - Once we had a signed agreement and a commitment to participate I had to
 - Set up each university as a customer in Workday
 - Create an invoice
 - Send the invoice via e-mail to the point of contact in finance at the participating institution
 - Setting expectations for participants
 - Communicating what we expect from them so they are prepared
 - They will need to create teams to do this work
 - We should then have a way to keep track of who is on what team in case we want to communicate with them specifically (ie: all teams at one univ or all teams in one topic area across all univ's)
 - Deliverables as a result of the training
 - This is tricky because we can't really require it but as with anything, they will get more out of it, the more that they put into it and we want them to be successful
 - But the easier we make this for them – by outlining it clearly and giving them templates and/or examples – the more likely they are to do the work
 - It would also be good to have one repository for this week so we can access it. I know some of it exists in Slack but it would be nice to have one place where we could easily find all work submitted by one univ or in one topic area or from a particular part of the training (ie: Phase II vs. Phase III)

Appendix K - Siamak Najafi and Ermal Toto Interview

Approved name - toto will set up a wordpress for us.

Wpionlineinstitute.wpi.edu

Ssl certificate (so it wont say not secure)

Setup wordpress site under new name

Need to determine wordpress domain name

Domain name needs to be approved by marketing

Approval may take time

Domain name can not be generic

WordPress allows multiple users to be created so multiple people can work at a time

Current website blocked under wpi wifi - def why no one has done survey only nancy and joe and they are off campus

Appendix L - Weebly Screenshots

<h2 style="text-align: center;">Home Page</h2>	<h2 style="text-align: center;">Events Page</h2>
<h2 style="text-align: center;">About Page</h2>	<h2 style="text-align: center;">Getting Started Page</h2>
<h2 style="text-align: center;">Contact Page</h2>	

Appendix M - WordPress Screenshots

<h3 style="text-align: center;">Registration Page</h3>	<h3 style="text-align: center;">Events Page</h3>
<h3 style="text-align: center;">About Page</h3>	<h3 style="text-align: center;">Registration Page</h3>
<h3 style="text-align: center;">Contact Page</h3>	<h3 style="text-align: center;">Program Content Page</h3>

Appendix N - Online Institute Program Feedback Qualtrics Results Survey

Questions	Responses
Q3. What is your preferred method of communication to receive information about the events?	Email: 10 Slack: 0
Q4. How easy is it to access the information about upcoming Phase III events?	Extremely Easy: 6 Somewhat Easy: 4 Easy Nor Difficult: 0 Somewhat Difficult: 0 Extremely Difficult: 0
Q5. How engaging was Phase III of the program to you?	Very Engaging: 2 Engaging: 7 Neutral: 1 Unengaging: 0 Very Unengaging: 0
Q6. What would make you feel more comfortable in engaging or participating in Phase III events? (Zoom breakout rooms, prepared presentations, etc.)	Zoom breakout rooms: 5 Prepared presentations: 4 Slack: 1
Q7. Did the program meet your expectations? Is there anything else you had hoped to achieve as part of this program?	Expectations: Yes: 5 Not at all: 1 Hoped to achieve: Hands on training, learning of technical applications, support for infrastructural upgrade, more reflective of difficult African milieu
Q8. Would you recommend this program to others?	Yes: 7 Maybe: 3 No: 0

Appendix O - Online Learning Platforms Research

1 Slack:

Slack is a communication tool that acts as a centralized location for users to share messages and files. It works on PC and mobile devices and has multiple forms of messaging and organizational options. Admins can make channels for specific purposes to sort information on the platform and filter discussion and files to specific topics. Slack is free in its most simplistic form. The Slack Plus editions allow users to access unlimited messages instead of the standard 10,000 stored messages. The benefits of the paid version of Slack are felt more on the administration side of the experience as it allows for a data export feature, SSO (Single Sign-On) and provisioning, unlimited workspaces, and 24/7 priority customer support. The pricing for Slack Plus is \$12.50 USD per user per month billed annually or \$15.00 USD per user per month billed monthly (Ansari, 2020).

2 Canvas

Canvas is a platform for higher-education online resources. It is a self-described “digital learning environment for educators, students, and institutions” (O’Laughlin, 2016). With both PC and mobile accessibility, the layout of Canvas allows for ease of administration and an organized approach for information delivery. Canvas charges a one-time implementation fee dependent on size, training and support. There is also an annual subscription fee based on the institution’s total number of users. Some attractive features of Canvas are, organized subsections, discussion boards and the ability to view statistics for data collection; in particular how many participants have viewed an assignment, video, submissions, opening announcements and more that could assist with the development of the program.(O’Laughlin, 2016).

3 Google Classroom

Google Classroom is a service developed for schools to simplify the process of sharing files between students and teachers. It uses a conglomeration of Google’s other online tools such as Drive, Docs, Sheets, Slides, Gmail, and Calendar. Google Classroom is free and is as simple to join and use as any other Google service. The service is available for PC and mobile uses and requires low bandwidth. All content can be accessed offline (Punit, 2019). A list of features Google Classroom also has:

- Share videos, links, or images from other websites with students
- Draft assignments or announcements and schedule them to post on a later date
- Google Calendar to track assignment due dates
- Using Google Meet to host virtual classes
- Originality reports (plagiarism check)

As shown above, Google Classroom has a variety of attractive features to take into consideration when deciding which platform fits best (BetterBuys, 2021).

4 Twitch

Twitch is a streaming tool available on both PC and mobile devices. Twitch allows for the installation of external databases and links, like Google, Canvas, or any platform that can be accessed via a link. Twitch also has an open discussion chat during live streaming, this can be helpful to answer questions but is dependent on the amount of people that are viewing the lecture. For data analysis, Twitch displays how many participants are watching the live stream, or pre-recorded streams. These data can be used to track engagement among users (Stephenson, 2020). Using TwitchTracker, user participation data can be evaluated for the span of one week, one month, 3 months, or all-time viewing.

5 Zoom

Zoom is a popular video communication tool that allows for easy and reliable video and audio conferencing. With a screen share and chat feature, users can relay information effectively. Additionally, Zoom offers a breakout room tool that can be used to communicate in smaller groups within a larger meeting. Zoom has a limit of 1,000 participants with the Large-Meeting Add-on feature. An attractive feature of Zoom, is that the live-stream videos can be recorded. Zoom does not meet our requirements to be the main platform for the Online Institute because it does not have the ability to store information. Zoom can however be utilized as an external source for recording lectures and live-meetings. Additional features are a waiting room and calendar integration feature (Zoom Video Communications, 2021).

6 Youtube Live

Youtube Live is a function of YouTube that allows content creators to live stream. Youtube Live offers live chat with moderation tools to help prevent inappropriate messages. Regulating that chat is an important task that comes with online learning to ensure that participants' questions are being addressed by the event speakers. Youtube Live can be used to broadcast from Zoom allowing more people to have access to the information. Broadcasting the Zoom meeting on YouTube Live also solves the issue of Zoom's participant limit. However, it does not have the complexity that Twitch has in terms of chat customization and communication between the viewer and the streamer.