AN EDUCATIONAL PERSPECTIVE ON ONLINE LEARNING PLATFORMS

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Abstract—The World Health Organization has identified the COVID-19 pandemic as a current hazard to humanity. As a result of the pandemic's successful global shutdown of several activities, including educational activities, colleges have migrated dramatically as a crisis response. Due to the cancellation of in-person classes, online learning has become more popular and has enabled students to continue their education. However, the abrupt shift from in-person to online learning has presented many difficulties for students, instructors, administrators and educational leaders. Zoom, Google Meet, Google Classroom and LMS platforms are the most frequently used media. Perceptions of the learning media have an impact on how students use them. This study intends to describe how students perceive the convenience and usefulness of the various learning tools accessibility. Overall, the research shows that the advantages of taking classes online exceed the difficulties that students may encounter. After showing the numerous advantages and drawbacks of using virtual learning in higher education, it is clear that there is still much opportunity for the future.

Keywords—COVID-19, Online Learning Platforms, Zoom, Udemy, YouTube, Skype, BlueJeans and Blackboard.

I. INTRODUCTION

The goal of online learning platforms is to have a smooth transition to remote learning. Since COVID-19 is very contagious, schools, governments, and parents realized that there needs to be some other form of an online platform where students can learn as efficiently as they would in person [10]. Of course, these platforms should also allow instructors to have freedom of teaching and not be limiting. Online learning can have its advantages and disadvantages. It gives the student the freedom of taking it anywhere. In some cases, students can rewatch the lectures after they take place. It can also distract students from the lectures and a lack of social interaction might be considered a disadvantage and bad experience.

While the technology is improving and the possibilities of ways to create an online learning platform are increasing. In the past, not everyone had access to the internet or computers, but now that most people have access, remote learning can be as efficient, maybe even more so than traditional learning. After all, the point of technology is to make life easier and more convenient while also making it efficient.

II. ZOOM

Originally made in 2011, but thanks to the COVID-19 pandemic in 2020, Zoom became one of the primary ways to transition to online learning. Most people when asked about Zoom, didn't know what it was until the pandemic struck and teachers and faculty looked for a way to give their lectures to students while remaining at home. While hosting virtual meetings for about 10 million people in 2019, as of April of 2020 Zoom increased video hosting to about 30 million people. Thanks to Zoom, teachers were able to video chat with their students, share their screen to show examples or relative content, and record their lectures for students who were either absent for the class, or who wanted to review what the teacher was explaining at their own pace. Zoom also provided a more hybrid classroom setting. While each state and county were slowly deploying COVID-19 regulations, students could either attend in person (if the school still allowed in-person meetings) or attend online. All teachers had to do was send out the link to students via email, or post the link in a spot that their students had access to, and everyone could join at the designated time of the lecture.

Zoom has allowed people to stay productive in a time where people could get no more closer than 6 feet apart, researchers have found that meetings tend to feel longer, they are tired after the meetings and feel irritated as well. This has been called "Zoom fatigue." Researchers say that this is because while the video call seems to be in real time, there is actually a delay that our brains are not used to [8]. Our brains tend to work harder to fix this delay and try to make it as synchronous as possible. Why is this so? Our brains have learned to synchronize with each other as best as possible [8]. Since there is a delay in our video conferencing, our brains will push to get as close to synchronizing as they do when we talk face to face. Another reason that people may experience this "Zoom fatigue" is because of the stress that they may feel when on a video conference. Most companies and schools may require participants to have their camera on while in the meeting. They may see themselves and come victim to seeing themselves as how they think others see them. This may cause unnecessary stress and anxiety in the meeting [9].

III. UDEMY

One of the most popular learning platform examples is Udemy [1]. Now that more technology is widely available and most people either have a computer or a laptop, but also

internet access has almost reached everywhere in the world, people can buy a lesson online and learn the topics. You can even use your phone to learn online. Udemy gives people the freedom to learn any topic. All you need to do is create an account, add a payment system, search topics that you are interested in or want to learn and simply buy the course. Not only does Udemy have very diverse and rich course lists, it also has a great platform for educators where any educator can provide their own course to the potential students. It is possible to learn and become proficient at a professional job with provided courses here, but of course it depends on the job and how many different courses you take. It will not be the same as university level education, though, it has its advantages. Some of the most important advantages are the price, which usually starts from $10.99 USD, good quality contents, large area of topics, and millions of other learners. There are even some courses where the instructor claims that their bootcamp is worth up to $10,000 if the students were to take the same courses on campus. However, the same course is offered for $5 on a sale if you take it through Udemy. Of course, the reason for this is the number of students that buy the course; in this case it would be at least 250,000. For the negatives, Udemy doesn't have free courses like other platforms, such as the Khan Academy. Additionally, some other platforms are supported by either big companies or foundations. Although there are constant sales running on the site, you can buy the courses for very cheap.

Udemy also has other useful advantages. Users can rewatch the lessons as many times as they like while also asking the instructor of the course questions (most instructors reply to the questions asked in the QA section). Users can also interact with other students, often helping each other out and answering questions in the QA section. Or, even better, some students come up with better solutions than the instructor, which can also be very helpful sometimes. Another good thing about a learning platform like Udemy is that a student can learn at their own pace and progress as one understands the topics. Udemy is very user friendly. It is easy to navigate and videos run smoothly, allowing an overall great user experience. It is not surprising that online learning admissions have climbed across the world due to platforms like Udemy. A report shows that in April and May 2022, there was a 200% increase in registrations for Udemy. People suddenly had more time at home with computers and internet when the lockdown happened, which led them to look for an online learning platform. Naturally Udemy had an increase in registrations since people could not learn face to face and had to look for alternatives. Udemy also has a feature where you can schedule learning time. Studies show that a person learns better when it divides the task/topics over time than a person who tries to learn it all in one go.

IV. YOUTUBE

Another example of an online learning platform is YouTube. It is an online video sharing and social media platform currently owned by Google. Even though it is technically not an online learning platform, people still use it as an online learning resource to aid their learning experience. Any user of this platform can upload their own videos and can also access any videos online for free. Unlike other learning platforms, the amount of material available on this platform is second to none. The difficult part is sifting through thousands of videos and online content to find the

one that fits the user's needs. Unlike conventional online learning platforms, YouTube uses algorithms to suggest videos and shows relevant videos based on your search history. There are also millions of content creators and experts to choose from. Unlike Zoom and Google Meet where students and teachers meet online, learning in YouTube is considered non-interactive and more about watching a sequence of videos recorded online. While a live stream is possible in this platform, it does not have the features like voice chat communication that makes human interaction easier and similar to in-person learning.

A. Security

Creating an account with YouTube requires the user's email address and password for account access and security. For security and privacy reasons, YouTube uses the user's email address and password to ensure security of their account. Based on this information, YouTube creates a unique YouTube address that can guarantee privacy and security. A case study of YouTube was done by Emad Abd-Elrahman et al in 2010 that measured the security performance of this online learning platform. If any user wants to access a video file, the server will distribute the user identity and file name ID of the file to the user. Using the same function which represents the securing part, the user will calculate the initialization vector to start the hash of the file. The initialization vector will be regenerated locally on the user side to avoid sending it by the server in case of insecure access. In this case, there is no entry point for man-in-the-middle attacks to change this stream of data because the attacker could not expect the function used to create the initialization vector of this file [11]. Another reason why YouTube is a secure online learning platform is because of Google's good history when it comes to security. Since 2019, hackers have been hijacking high-profile YouTube channels to broadcast cryptocurrency scams or simply auction off access to the account [15]. On November 1, 2021, Google required all monetizing YouTube channels to enable two-step verification [12]. This additional layer of security can help prevent unauthorized access to accounts and add more security to the already secure YouTube platform. According to Google, 97% of connections to YouTube are now encrypted. Hypertext Transfer Protocol Secure (HTTPS) now accounts for 97% of all connections to the site [13]. In addition, A risk and attack surface management platform called UpGuard gave YouTube an A security rating with an 884/950 score. The higher the score the more likely it has good security practices [14].

B. Performance

Before the pandemic, most students were already using YouTube as a supplement or aid to their education [16]. Students used it to watch videos to solidify their understanding of a subject or used it to develop and learn marketable skills for their careers. When the pandemic came, things began to change. Both students and instructors began to utilize all the available features and functionalities that YouTube has to offer. In addition to Zoom or Google Meet, instructors began using it as an additional resource by showing YouTube videos during an online class. Some instructors even began recording their YouTube video lectures for their asynchronous lectures. A case study by Joseph Lichter showed the effectiveness of YouTube as a platform for teaching even before the pandemic. The exam

results of students who used YouTube compared to those who did not [17].

A study done by Y. Chtouki et al is another example of the effectiveness of YouTube as a learning supplement. In his case study, 65% of students who used YouTube videos passed compared to only 50% for traditional learning methods only [18].

Despite its effectiveness as a learning tool, it still has a lot of shortcomings that need to be addressed. YouTube has a lot of characteristics that make it less desirable than other online learning platforms. For users using YouTube for self-learning, picking the most relevant and appropriate instructional videos among millions of available videos online is one of the most difficult tasks. Students who use the YouTube search engine for self-directed learning tend to watch videos from the top of the returned list [20]. Even though YouTube uses algorithms to suggest videos and shows relevant videos based on your search history, they still list them mostly based on views. In determining which videos to choose, most users depend on likes and views of a video shown on YouTube. This might be a first step, but it is not enough to help users. According to P. Appavoo et al, a more scientific approach is needed, and their study has compiled a set of carefully selected criteria to assess the suitability of videos for instructional purposes [19].

Another negative aspect of YouTube is the presence of advertisements on videos. Unlike other online learning platforms, YouTube is plagued by the presence of advertisements that are more likely to affect user experience. Small advertisements with a duration around ten seconds cannot be skipped, while larger video ads allow the user to skip them after watching four seconds of content. In addition, the delivery of the advertisements occurs before the delivery of the requested video [21]. For a free video sharing service, they still need to make money so this will never go away. A study made by G. Dimopoulos et al showed that users are more likely to abort a video when the advertisements are not skipped [21].

Before we consider YouTube as our online learning platform of choice, some changes must be made to the platform first. One possible improvement to YouTube is to have a mode like Google scholar. Instead of searching videos normally based on views and likes, a different algorithm should be used to search for more reliable videos from expert instructors. Using P. Appavoo's scientific approach should be considered [19]. Another improvement to consider is to integrate Google Meet with YouTube and allow users to seamlessly transition between the two. Another possible improvement is to reduce advertisement time and provide the user the option to watch the advertisements at the beginning instead of the advertisements popping up in the middle of the video. Security issues such as social engineering attacks should also be addressed. For example, YouTube needs to help its users identify scams on the comment section by making minor changes to its interface.

YouTube as an online learning platform works best as a tool to support learning and as an aid to another online learning platform. When it comes to being a stand-alone online learning platform, its disadvantages outweigh its advantages. It is still possible for a user to learn using YouTube, but it will take him more effort to learn here than in any other online learning platform.

V. SKYPE

During the pre-COVID-19 era, email, electronically conducted surveys, and text-based instant messaging were the primary forms of communication employed in early qualitative research. This later grew to include video conferencing programs like Skype and Zoom. Skype and voice over internet protocol (VoIP) have been used, for example, in qualitative interviewing, research into sustainable tourism, Ph.D. research, and longitudinal ethnographic research with young people and their families [2].

When it comes to dealing with technological problems, having real-time discussions, and brainstorming, synchronous remote learning is thought to be more beneficial. The atmosphere offered by synchronous distance learning is more comparable to that of a typical classroom and provides for quick feedback. In contrast, asynchronous remote learning may result in decreased levels of interaction, interest, and engagement among students due to feedback that is delayed. Skype is a free communication software that enables users to make calls, participate in online video conferences, and send instant messages. The software encountered technical problems where students faced a communication gap because of connection issues that caused cuts in the sound and image. They also stated that they encountered problems such as not seeing each other clearly and not making eye contact by video call because they needed to purchase the full premium of the Skype program [3].

TABLE 1. STUDENTS' PERCEPTION OF SYNCHRONOUS COURSES USING SKYPE-BASED VIDEO CONFERENCING [3].

	Technical Problems	Medium	Time management	Number Of Participants
P1	Sound problem Connection problem Unable to see each other in video	Comfortable environment Need to buy the original version.	Unable to manage the time.	Appropriate with small number of participants
P2	Video problem	Need to buy the original version.	Unable to control the time.	Many responses make confuse
P3	Sound problem Connection problem	Comfortable environment	--------------	--------------
P4	A voice interrupts Connection problem	--------------	Unable to manage the time.	Many responses make confuse
P5	Audio echo Connection problem	Comfortable environment Need to buy the original version.	Unable to control the time.	Appropriate with small number of participants
P6	Technical Problem	The Technologies used	--------------	Many responses make confuse
P7	Internet Connection Voice Interruption	Comfortable environment Need to buy the original version.	Unable to manage the time.	Small number of participants make easy to control everything
P8	Connection problem Eye - Contact problem	Comfortable environment Need to buy the original version	--------------	Small number of participants make easy to make video call
P9	Low Connections Unable to see each others	The Technologies used	Difficulty to agree on time	--------------
P10	Quality of image is low Internet Interruption	Limitation of group calling The Technologies used	Unable to manage the time.	Small number of participants make easy to control everything
P11	Delay in sound Eye - Contact problem	Comfortable environment Need to buy the original version	Difficulty to agree on time	Appropriate with small number of participants
P12	Technical problem	-	Unable to control the time	Many participants ,everything will mess up
P13	Voice Interruption Connection problem	Quality of programs used , computers and Internet	Unable to manage the time	Appropriate with small number of participants

The table above is categorized into four parts; Technical Problems, Medium, Time Management and Number of Participants. In this study, the factors that have the biggest impact on participants' perceptions are the technical

problems. Participants' negative judgments of technical problems, such as sound cuts and echoes, failed video calls, and poor internet connections, distracted them from the online session.

In another study [4], they shared that at the completion of 2010, there were over 660 million consumers of Skype across the globe with over 300 million active each month at the end of August 2015 (global social networks by users 2015) and in February 2012, Skype had 34 million active customers online (34 million people concurrently online on Skype). At the end of March 2020, Skype was used by 100 million people on a monthly basis and 40 million on a daily basis (Microsoft Teams is coming to consumers — but Skype is here to stay) [4]. Overall, there are many technical solutions for online teaching and learning, however, they can occasionally generate a variety of issues. These challenges and troubles with modern technologies include downloading, installation problems, login problems, and audio and visual glitches.

Skype for Language Teaching/Learning

A new language can increase a student's chances of finding employment in the future and put them up for success in almost every area of life. As the world grows more globalized, learning a foreign language is all about developing the key life skill of being able to connect and communicate with others, which can only be acquired by interaction with others.

With the help of modern technology, students can now study a foreign language in an interactive way from anywhere, at any time, and with no restrictions. Skype provides native speakers who are completely qualified and have experience teaching students of all ages, from children to seniors. Every student who wants to be ready for a particular language exam can use Skype's wide range of programs.

Different ethnicities, faiths, socioeconomic backgrounds, and cultures are also connected through Skype in the Classroom. By enabling students to connect on a personal level, build empathy, and learn to recognize a person for their heart's true nature, Skype in the Classroom helps to overcome the geographic gap created by oceans and continents. At the same time, it subtly but effectively improves all four language abilities.

A study by T. Dabic, S. Grkavac, Ž. Stojanov and R.Suzić called "Language Benefits with Skype in the Classroom" created a questionnaire that included 12 questions designed by the researchers through Google Forms.

The sample included 55 teachers from all over the world. The majority of them are from Germany and Russia, then the United States of America, but there are also teachers from China, Japan, Puerto Rico, Tunisia, Bangladesh, Slovenia, Albania, Bosnia, Montenegro, and India. One of the questions that stood out to me was, "I use Skype in the classroom…" in terms of a timeline. The great majority of them, or 41.8%, answered that they use Skype in the classroom between two and five years, and 27.3% answered that they use it for more than a year. Some teachers, or 9.1%, use it for more than five years, and there are 27.3% who use it for less than a year [5].

Overall, students can use Skype in the Classroom to increase their vocabulary, practice speaking and listening, or learn slang. By conversing with native speakers, picking up new terminology, and perfecting their pronunciation, they have the exceptional opportunity to lessen their nervousness. It inspires students to study more, and it is a great method to improve communication and language abilities in authentic settings.

VI. BLUEJEANS AND BLACKBOARD

BlueJeans and Blackboard are two other platforms that were used very heavily during the peak of COVID-19, and there are reasons as to why these were some of the shining candidates for online learning.

BlueJeans is a company made by Verizon that provides an interoperable cloud-based video conferencing service/platform. Being able to hold cloud-based calls and meetings anywhere and anytime with high consistency made it a no-brainer for some colleges and companies to use over the course of COVID-19. It provided its services to over 180 countries, and has the data to show how much it peaked during the beginning of COVID-19, and how it maintained over the course of its duration with progressively increasing usage [6].
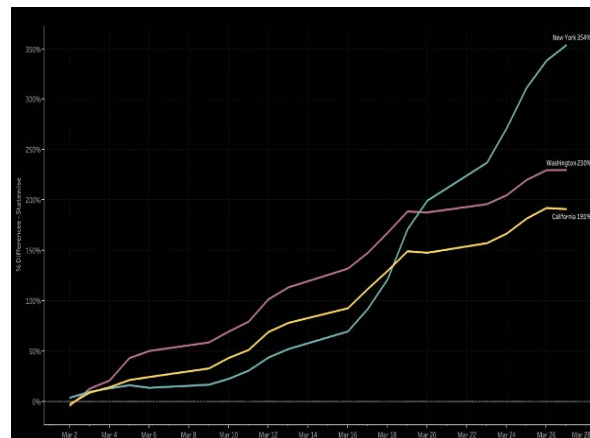

Fig. 1. The increasing usage of BlueJeans during COVID-19.

The data shown above shows a very large and visible bump in usage of the application starting around March 3rd, when the virus became a large enough problem to have us working and learning from home. All in all, they saw a greater than 100% increase in utilization in 47 states [6].

And how does it tie into Human-Computer Interaction (HCI)? With a well-developed and easy to use/browse UI, it makes it very easy for everyone to pick up and use BlueJeans. Especially those who are not as familiar with the technology as some were at the time, it made for a very smooth and simple transition to the program when working from home. It very much fits into the category of "ease of use."

And what of Blackboard? What is it and why does it tie in? Blackboard is a web-based virtual learning environment developed by Blackboard Inc. It features course management, customizable open architecture and a scalable design that allows integration with student information systems and authentication protocols.

In a research study from a questionnaire survey that gathered 494 university students' responses as participants, the findings highlight the present understanding of Blackboard from the learners' point of view. They determined that the prime influences for using Blackboard were performance expectancy (PE), effort expectancy (EE), social influence (SI), and its facilitating conditions (FC) [7].

What are the practical implications? The study implies that the collaboration was appropriate according to the current phenomena of the COVID-19 pandemic and its thorn in the side of higher education (thus enforcing online learning systems) [7]. Because of Blackboard's customizability, educational institutions within the study would emphasize the importance of the students learning by improving the interface, thus directly increasing the learner's effectiveness in using such a platform. With the research conducted, and social implications in mind, the study shows it is recommended to introduce the course work, qualifications, and certified courses (with integrated homework) to ongoing classes [7]. It allows the learners to continue both their studies and their work (as well as being safe at home). It also gives an integrated platform to share research and learning. Blackboard offers a place to maintain all information in one place, thus lowering the load on both students and educators.

And what does this mean for HCI? Well, like BlueJeans, Blackboard is easily usable and accessible for both students and professors, allowing for a vast array of customizations and UI readability changes. However, it comes with its own drawbacks, namely a poor navigation system, very difficult to navigate mobile design, and a lack of training for those using it [22].

VII. Conclusion

As the past two to three years with COVID-19 progressed, people started to keep a more hybrid work ethic. Some companies are still allowing people to work from home, while still having employees come in a few days a month for in-person meetings or in-person work days. As companies and schools continue to incorporate these hybrid methods, online learning platforms can still improve to make those who are working at home and having online meetings more smooth and as interactive as possible.

The paper illustrates how the pandemic's self-isolation, quarantine, and lockdown affected the student's ability to complete their coursework. It is evident that by acting as the main platform for instructional design, delivery, and evaluation platforms, instructional technology has significantly aided in reducing the impact of this pandemic on educational activities. In spite of universities and other institutions of higher learning abruptly shifting instructional delivery to online platforms during the pandemic, it is clear that online learning will prolong and education will become more hybrid as long as the difficulties faced by faculty and students are thoroughly explored and turned into opportunities.

To make sure that online and blended learning is widely used in developing cultures during the post-pandemic period. More funding and investments from the government are required. Additionally, educational institutions must make investments in creating new online learning platforms, enhancing those that already exist, and increasing access to the internet and online library materials. With the conclusion of this paper, we believe that the provided topics are great tools to be used for future online learning.

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