Instructional Systems Design and the Diffusion and Adoption of Technology (Volume 1)

Chapter 4: Zoom in Higher Education

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Citation:
4. Zoom in Higher Education

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Key Points:

- In 2022, it is a simple process to video chat someone across the globe, but it was all made possible with the help of American Telephone and Telegraph Company (AT&T) in 1927.

- There are multiple video conferencing systems available such as Skype, Webex/Cisco, and Zoom. With the right marketing strategies, Zoom earned the win during the COVID-19 pandemic to aid in virtual higher education classes.

- Online examinations can be proctored with the assistance of lockdown browsers or Zoom software. Red flags have been raised with Zoom video proctoring as many view this as violating students privacy.

Abstract

Think back to the Spring semester of 2020. What classes were you taking? Were they in person or online? Personally, I was registered for all in-person classes, but I had taken online classes in the past. When COVID-19 shook the world and in-person classes were changed to online, students were quite concerned about what this intaled. Surprisingly online classes have been around for a while, and with the power of Zoom, well thought online classes were a breeze for
many students to navigate. Technology such as instant messaging and facetime are all diffused into Zoom to make up one platform, but as everything, it has evolved and will continue to.

Beginning of online learning

Distance learning has been circling the globe since the 1920s and 1930s using radio and television (Novak, 2012). University of Houston Television (KUHT), now known as Houston PBS, aired one of the first real-time college classes via live television, and continued to run educational material weekly (Writersm, 2022). Two years later, the University of Phoenix created bachelors and masters degrees. Today, according to the National Center for Education Statistics, during the fall of 2020 semester, 73% of postsecondary students were enrolled in online education courses (NCES, 2021).

You’ve Got Mail

The Advanced Research Projects Agency Network (ARPANET) in 1969 was the first electric mail system to link multiple computers together for communication. It wasn't until 1971 that Ray Tomlin designated the “@” symbol so emails could be sent to specific locations. Even with the “@” symbol designating email locations, in the 1980s email hosting sites or ISPs (Internet Service Providers), were created to connect users from across outside networks (Phrasee, 2021). Real time chat as a technology innovation was diffused by the general public starting in 1997 when AOL (America Online) created AIM (AOL Instant messenger). AOL messaging consisted of real-time messaging in group or private chat rooms and “buddy lists” (Maize, 2020). One year later, Yahoo launched their messenger system to allow messaging between users with their Yahoo ID (Maize, 2020). Another year after that, the first real competitor to AOL and Yahoo, MSN (Microsoft Network) launched their messenger (Maize, 2020). Finally in 2002, Apple iChat
made a debut on the Mac OS X Op System and was compatible with AOL instant messaging (Maize, 2020).

**Early Video Conferencing**

Video Conferencing dates back to the 1870s, but the first live moving image was sent in 1927 by American Telephone and Telegraph Company (AT&T) Bell Telephone Laboratories from New York to the White House (Patrizio, 2021). The problem AT&T discovered was that New York could see the White House, but the White House could not see New York. Finally, in 1931 the first successful two-way video call was between AT&T offices in Manhattan. A few years later, in 1936, Georg Schubert created Gegensehn-Fernsprechlanagen, or a "visual telephone system" (Patrizio, 2021). These video booths were set up in post offices and seemed to be a prototype of what modern video calling would be. AT&T’s Bell Telephone Lab fabricated a 2-way video phone known as the “PicturePhone Mod I b” (Patrizio, 2021). The picturephone was showcased at the World’s Fair in 1964 as the first video phone. Competition to AT&T’s PicturePhone was announced in 1982, created by Compression Labs. This system was considered the first commercial group video conferencing system and had a hefty upfront cost of $250,000.

Fast Forward to 1991, PictureTel attempted to create a PC video conferencing system (Patrizio, 2021). The first desktop video conferencing platform, CU-SeeMe, was launched in 1992 through Macintosh OS and Windows in 1994. The more common video conferencing system, Polycom (now “Poly”), was founded by two PictureTel colleagues in 1990, then launched in 1992. This system had a triangular speakerphone and advertised its high quality audio which allowed both video participants to “speak and be heard” (Patrizio, 2021). As we know today, FaceTime and Apple’s iPhone 4 were released in 2010. The iPhone 4 originally only supported Wi-Fi connections but later added 3G and 4G/LTE connections.
Higher Education Video Conferencing

Skype, Webex/Cisco, and most importantly, Zoom have helped online classes become a more engaging and inclusive environment, without the need for specialized, complex video conferencing rooms or systems. Skype launched in August of 2003 and was created by Estonian software engineers. Skype stands for “Sky Peer to Peer,” and the original software allowed voice calls from computer to computer (Cowling, 2016). They later launched Skype 0.9, which allowed calls to landline phones from PC computers. In 2005, eBay purchased skype for 2.5 Billion and wanted to focus on a later unsuccessful streaming video service - Joost. Similar to chat rooms or AOL AIM, in 2006, Skypcasts were launched, allowing up to 100 participants to join for voice conversations. Two years later, Skype began to focus on adding video calling to their software, and launched Beta 4.1 in 2009. This update allowed members to share their screen, and finally in 2010/2011 video calls were available for iPhone and Android users.

Zoom was founded by Eric Yuan in 2011. Eric Yuan has an interesting background, as he originally worked for WebEx, a company focusing on video conferencing. Yuan became the Vice President of engineering, and in 2011 he proposed to Cisco & WebEx a video conferencing system for smartphones. WebEx did not accept his proposal, so he quit his position and started his own business, Zoom Communications (Abhinandhinee, 2022). Zoom’s first beta was released in 2012, with Zoom 1.0 released in January 2013 to the public.

Lastly, Webex was established in 1995 by Min Zhu and Subrah Lyar, under the name “ActiveTouch”. In 2007, Cisco purchased Webex for approximately 3.2 billion and $57 per share (Cisco, 2007). Webex is a cloud-based video conferencing system with similar features to Zoom. Through video conferencing, participants can share their screens, and be broken up into private rooms, and meetings can be recorded then broadcasted. Through Slack and Microsoft Teams, participants can join video conferences and schedule and integrate meetings with participants using Outlook, Office 365, and Google Calendar.
Again, try to think back to classes prior to the COVID-19 pandemic. Online learning has been around for a long time, and the pandemic was not what made colleges years ago diffuse to online learning. Universities began to use Zoom integrated with online lectures so that students had a more flexible schedule and the possibility of a faster education track. By advertising to students that they could still work a part-time or full-time job while taking classes online, interested students. When thinking about students taking online classes, 62% work either a full or part-time job (Chapman, 2017). With colleges adding Zoom to their online classes, instead of students meeting in person, there are scheduled meetings, and students log on to join class. One main problem that educators and students stumbled upon, was having access to a computer, webcam, a reliable Internet connection, and getting logged into the chat. Prior to COVID-19 classes, I would consider Zoom to be new technology as I only used it in one online class. With new technology, comes problems/solutions, but students and educators quickly caught on. Rogers introduced the classic diffusion curve that describes innovators, early adopters, the early majority, late majority, and laggards (Rogers, 2003). Zoom’s growth in an already crowded sector was fueled by focusing on the needs of its innovators and early adopters to resolve issues and add the features that the early majority needed (Shah, 2022). The education and healthcare makerspaces were a particular area of focus. Zoom also focused on user needs, ease of use, support for mobile devices, and continued innovation. Innovations included Zoom Webinars, Rooms, Events, and Phone in addition to Zoom Meetings, breakout rooms, virtual backgrounds, and accurate auto-generated closed captioning. Before the pandemic, Zoom was probably already mainstream in higher education being adopted by increasing numbers of the early and late majority users. However, the pandemic further accelerated adoption.
**Diffusion During the Pandemic**

It seemed like a difficult task for colleges to transfer to online learning, but with Zoom and its clever marketing strategies, it was a mostly smooth transition for many. Personally, I have difficulties with online classes due to downloading software and understanding how to use it. Zoom marketed its videoconferencing system as a simple to use software that required no downloading (Moolchandani, 2021). With the click of a button, participants could access a meeting with the invitation link that was given by the host. Zoom also has a free version where a host can add up to 100 participants to one meeting (Moolchandani, 2021). This limit was generous as compared to other services. For instance, the competitor company Microsoft, who owns Skype, allowed a host to add only 50 participants to a meeting at a time (Moolchandani, 2021).

As classes transitioned to online, Zoom became more popular and in demand. Back in May 2013, a million users were logged in per day, compared to December 2019, when there were 10 million participants in daily meetings (Iqbal, 2022). In March of 2020, when the COVID-19 Pandemic struck colleges, Zoom reached 2.13 million downloads in a single day (Iqbal, 2022). Alongside TikTok and PokemonGo, Zoom was added to the exclusive list of apps being downloaded over 300 million times in a single quarter. Zoom clearly grew thanks to the pandemic, and Zoom was considered “one of the fastest growing apps of the pandemic”, as their meeting participants increased by 2,900% (Iqbal, 2022). When comparing mobile apps, in March 2020, Zoom was downloaded 3.7 times more than Skype (Moolchandani, 2021). During the Spring 2020 semester, over 1,300 colleges switched to online learning platforms such as Zoom. When COVID-19 peaked, over 90,000 schools were using the Zoom platform for educational purposes.

With Zoom rapidly growing and more participants logging on than ever before, Zoom became the new standard in virtual classroom environments. Throughout 2020, over 45 billion minutes of webinars
were hosted, and more features were added. Educators were able to break students into “break out rooms”, which allowed students to work in smaller groups or with a partner. If the host chose to record the session, students could return back to the recording to review, but this was also important for students who may have missed the lesson. Those students could easily access the recording, as well as a transcript below the video. A search feature was also added where students could search the transcript to easily find a certain topic or speaking point without rewatching the entire recording. Educators also enjoyed being able to poll students during a lecture, which frequently was used to make sure students were actively participating and not nodding off.

While there are direct, intended, and beneficial consequences introduced by technology innovations, there are also indirect, unintended, and undesired consequences (Rogers, 2003). Aside from all of the great things Zoom had to offer, there were some problems. In March 2020, the FBI issued a statement about hijacking virtual online classrooms. Classes and teleconferences were hacked by saboteurs which displayed and commented pornographic images, racial slurs, Nazi swastikas, and many other offensive images. Another issue arose during the Fall semester of 2020 during the first day of class. Zoom had an outage across North America and parts of Europe and Asia, where students were unable to join their scheduled class meetings. When trying to join, their screens were prompting them to wait for the host to start the meeting. Many classes utilized another platform, while others canceled that day of class (Lumpkin & Svrluga, 2020). While Zoom was very innovative in making its service as user friendly as possible, one of the consequences of this ease of use was an initial lack of security features that Zoom had to correct. Zoom’s growth has begun to slow, a possible indication that Zoom has reached its late majority and late adopter/laggard user groups (Iqbal, 2022). Without introducing further innovation, it will be interesting to see if Zoom can maintain the market share it created during the pandemic.

Personally, I have not encountered these issues. I think with all things technology, there will be problems/glitches, shortly after an
update will be announced to correct the glitches. I definitely think online classes will be sticking around as they are convenient for students with jobs and for students with medical conditions who do not feel comfortable entering a classroom with COVID-19 and its variants.

**Lockdown Browsers**

In the educational setting, Zoom is commonly used for class lectures, but it has also been used to accompany lockdown browsers while testing. When classes switched to online, many teachers wondered how students would follow their college’s academic integrity policy. In online classes that I have taken, the first question of the exam would be stating the college's academic integrity policy. If you understood and agreed to follow that policy, you would type your name or select “I agree”. With that in play, students are still able to simply click yes, and then open their textbook to look up an answer without the instructor ever knowing. With that being said, Respondus was created as a browser that locks down a computer within a student's BlackBoard window. When students enable Respondus, they are unable to print, copy, visit another URL page, or view other applications on their computer (Marjanovic, 2021). This seemed like a great idea, but Respondus only locked down the device on which the exam was being taken on, such as a laptop. Students could still view a paper textbook, printed notes, access their cell phones, or even another laptop/iPad.

In 2013, Respondus launched a lockdown browser monitor system. Respondus Monitor was considered a fully automated proctoring system (Duotl, 2020). When entering the exam, students would allow their webcam to record themselves while answering each of the questions. When the exam was submitted, any flagged events and proctoring results would be sent to the instructor for review. While testing, the system used facial recognition, but false flagging was occurring frequently. False flagging was noted to occur with students of color, inadequate wifi connection, inadequate lighting, or
accommodation needs (Marjanovic, 2021). To avoid false flagging, instructors began to use Zoom to proctor exams. Instructors could set specific dates and times for all students to join a Zoom meeting and test as a class, or students could create their own Zoom meeting, record the session, then upload the video with their exam. As an educator, having students record their own session and being required to look through the recordings for cheating would be time consuming. As a student, if you were being recorded, would you really try to cheat? Proctoring students through zoom came with only a few mistakes, but mainly as long as the students have their microphone on, camera on, and the session is being recorded, they are good to go!

Students not only worried about exams being flagged, but what about their privacy while being recorded? While students are recording themselves taking their examinations, students are being forced to disclose their living arrangements (Tariq, 2021). Zoom does have a feature that can blur out the background of a participant's screen, but for testing purposes, filters usually have to be removed while testing. Students are also being forced to give full access to their computers and browser while using a browser lockdown software. When a software locks down a computer, how can a student be sure it is safe? As an undergraduate student, when I used the Respondus lockdown browser for testing purposes, as I would exit the exam, my home wallpaper was always reset to a factory wallpaper. If the wallpaper on my homescreen was being changed, what else was being changed? Another example of unintended consequences; privacy concerns have resulted in many institutions discontinuing their use of locked down browsers and other proctoring solutions.

**Conclusion**

In conclusion, even with video technology being around since 1927, it is still being actively diffused into education. There are several video conferencing systems for educators to choose from, but educators and students seem to have a favorite. Zoom offers easy accessibility, and has many features including break out rooms,
recording available to replay past meetings, and capabilities to proctor online examinations. For students, it is a concern that recorded examinations are a violation of their privacy, and while using a lockdown browser, who is really in control of their laptop? I think that online classes in conjunction with Zoom create a similar class style to traditional in-person classes. By adding Zoom meetings into online classes, it shows that technology has diffused into the educational setting, and I think it will continue to diffuse as technology improves.
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