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Public Speaking in the Metaverse: Integrating Public Speaking and Extended Reality to Improve Students' Presentation Skills

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Abstract

The use of extended reality (XR) provides new and exciting ways for students to practice various skills in a safe and realistic environment. In this activity, I describe and reflect on how I integrated XR into my public speaking class with the goal of helping students refine their presentation skills and simulate different speech contexts that would be difficult to replicate in the traditional classroom environment. Although XR cannot (and should not) replace in-person public speaking, it can provide a realistic simulation of the real world and help alleviate students' anxiety over speaking publicly in unfamiliar situations.

Keywords: public speaking, extended reality, virtual technology, instructional communication

Public Speaking in the Metaverse: Integrating Public Speaking and Extended Reality to Improve Students' Presentation Skills

Recent advances in digital technology have changed the way higher education approaches learning. Students, faculty, and educators have started to explore and embrace new technologies that allow them to transform the classroom experience. Augmented reality (AR), mixed reality (MR), and virtual reality (VR) — collectively referred as extended reality (XR) — have received growing attention across disciplines for their capacity to simulate real-world experiences and go beyond the affordances of traditional learning contexts. Using special goggles or displays, these technologies can place virtual and digital three-dimensional assets into the field of view using holograms, creating virtual environments in which individuals can move and act (Burian et al., 2023). XR has been used in fields such as health care, engineering, linguistics, and performing arts to help students practice high-precision skills in a safe environment (Andrews et al., 2019). XR offers promising avenues to the communication discipline to help individuals develop interpersonal skills such as listening, interviewing, training, and public speaking (Mandhana et al., 2024; Schmid Mast et al., 2018). In this article, I reflect on and describe my experience as an instructor leading an in-class activity that seeks to integrate XR into public speaking classes.

Despite the safe and inclusive environment that public speaking instructors try to foster (Parcha, 2024), many students still report high levels of anxiety surrounding the experience of delivering an oral presentation (Dwyer & Davidson, 2012; O'Hair et al., 2011). XR can be beneficial to reduce fear of public speaking and give individuals an opportunity to practice in front of a virtual audience (Ebrahimi et al., 2019; Takac et al., 2019). Studies have found that interventions using virtual reality exposure therapy (VRET) can be beneficial in reducing state-like public speaking anxiety (Stupar-Rutenfrans et al., 2017), and that traditional (in-person) in-vivo exposure therapy (IVET) is only marginally superior to VRET (Reeves et al., 2022). Extended reality creates the perception of being physically present while in a virtual environment, and this sense of presence can heighten and

simulate physical and physiological responses associated with real public speaking performances. XR technology also offers the benefit of customizing and selecting aspects of public speaking that individuals want to improve upon, such as eye contact, gestures, and vocal qualities, thus maximizing opportunities for refining organizational and delivery skills. Given that public speaking classes are often limited in the degree to which students can practice in front of large audiences, speaking contexts, and speech genres (e.g., business meetings, networking events, debates), XR has the potential to increase the transferability of course assignments to reflect real-world scenarios that might be difficult to replicate in class. Furthermore, because public speaking classes are often designed to reflect normative socio-cultural assumptions of Western, ableist cultures (Rouse, 2024), supplementing in-class activities with XR might increase the accessibility of public speaking to students from different learning or linguistic backgrounds.

As higher education institutions invest and experiment with XR technology in various capacities (Georgieva et al., 2024), XR offers valuable opportunities for educators to promote experiential learning. In this article, I report and reflect on how I used XR in my public speaking course to extend, complement, and supplement the work that I have already been doing with my students. This article reflects my experience as an instructor; no data was collected from students.

The Activity

Courses

Public Speaking, Business Communication, Business and Professional Speaking, or other courses with a public speaking assignment could make use of this activity.

Objectives

The proposed activity seeks to describe and explore the potential advantages of integrating extended reality into the public speaking classroom. Using VirtualSpeech, an award-winning soft-skills training platform with virtual reality and artificial intelligence integration, students will be able to (a) practice their public speaking skills through virtual

simulations with audiences and contexts that would be difficult to replicate in the traditional learning environment, (b) gain a rich learning experience through engagement with extended reality, and (c) reflect on the new and sometimes contradictory affordances of using extended reality to overcome fears associated with public speaking.

Setup

To implement this activity, instructors need access to an XR headset compatible with the VirtualSpeech app (https://virtualspeech.com). At the time of the writing of this article, there are many XR headsets on the market at various price points. I conducted my activity in an XR lab at a private U.S. university using the Meta Quest 2 headset, which Meta currently sells refurbished for $189.99. Instructors do not need access to an XR lab to implement this activity. “Cardboard headsets,” which utilize students’ smart phones, are a less expensive alternative to practice this activity. Before class, I went to the lab with three students to test out the headset and install the VirtualSpeech app to ensure everything worked properly.

VirtualSpeech provides realistic simulations for large-audience presentations and exercises to practice communication in the workplace, such as giving a sales pitch, networking, or practicing a job interview. The VirtualSpeech app is currently supported by all of Meta’s Quest headsets and is free to download through the Meta Horizon Store. Instructors can assign various tasks and exercises and allow students to work individually or collaboratively in virtual workrooms. The Meta Quest 2 and newer headsets have recording capabilities, so students can receive feedback on their verbal and nonverbal delivery, including eye contact, paralanguage, posture, and gestures. The activity described below can be conducted using the free version of VirtualSpeech, but a paid subscription service with additional features is also available.

Lesson Plan

My class included a total of 17 undergraduate students of various standings and majors enrolled in my public speaking class. Although the class is not mandatory for all undergraduates, it fulfilled the oral presentation requirement of the general education curriculum at the university, so many undergraduates elect to take the class. For many of the

students in my class, this was their first time taking a public speaking course. This activity could be scaled up to 20–25 students depending on the number of headsets available and duration of the class. The following activity was conducted in the XR lab during one class period of one hour and five minutes; however, this activity can be extended to an additional class period to ensure that students have enough time to practice. Because the XR lab could not accommodate all the students doing the activity simultaneously, I divided the students into groups of three or four so everyone could take turns trying the app in their small groups. We had a total of five stations set up in the lab, and each station had one headset.

After accessing VirtualSpeech, students were asked to enter a practice room and deliver a speech they previously prepared during the semester (e.g., informative speech) or select one of the following activities: delivering a professional presentation in a large conference room, delivering an impromptu speech in a lecture hall, or giving a commencement speech. Students could also select different modalities to deliver their presentation (e.g., favorable, neutral, hostile audience). Upon selection of their exercise, students were projected into their immersive experience and were asked to complete their speech. To make the experience accessible to the other students in the group, we used the screen sharing option to cast the images seen on the Meta device to an external monitor. In this way, students were able to see what their classmate was seeing on the XR headset (see Appendix A). Students had approximately 15 minutes each to try VirtualSpeech before rotating with their classmates.

Debriefing

We used the following class period to collectively debrief about the activity. Students were asked to form the same groups they were assigned in the lab and discuss their experience for 15 minutes. Afterward, we debriefed as a group and talked about the different ways that the XR technology can change how we approach a class like public speaking. I wrote students' answers on the board. Although some students had prior experience using XR technology in the context of video games, most students had not considered the possibility of using XR technology in a class like public speaking.

Appraisal

From the in-class debriefing, I identified four main themes that characterized our learning experience: *supplementing (not replacing) public speaking*, *providing real-life simulations*, *alleviating public speaking anxiety*, and *acknowledging XR limitations*.

First, we discussed the role of XR technology as *supplementing (not replacing) public speaking* in front of a real audience. VirtualSpeech allowed students to decide which specific things they wanted to work on (e.g., pace, eye contact, gestures, tone and inflection), which could help them to focus on specific aspects of the presentation. We also discussed how XR would be a great tool to prepare for speeches, and that using it more frequently would help students to merge the virtual and real worlds, even though it cannot fully compare to doing it live, nor would it become a complete replacement for speaking in front of a crowd.

Second, we discussed how XR could *provide real-life simulations* and opportunities to practice public speaking in contexts that would be difficult to replicate in a traditional classroom environment (e.g., large crowds, ceremonial addresses, professional meetings). XR could allow students to get more practice in different environments, such as a work presentation in front of colleagues, simulating job interviews or conversations with a supervisor, role-playing conflict, or practicing a work-related presentation.

Third, we reflected on the opportunities that XR technology could offer for *alleviating public speaking anxiety*. XR could help students to get over their initial nerves, simulate a practice session, or get used to being in front of a crowd. XR could be a gradual first step into public speaking for students who would have otherwise not even given public speaking a try because of their anxiety. This reflection aligns with the findings of recent studies that virtual reality exposure therapy significantly decreased public speaking anxiety, and that the decrement was the strongest in participants with initially high speaking anxiety baseline levels (Stupar-Rutenfrans et al., 2017).

Finally, we discussed the limitations related to the XR experience and the long-term implications of integrating such technology into the public speaking context. Despite the incredible realism of the XR environment, using virtual reality has the potential to

feel weird and unnatural, especially when talking to holographic characters. Additional limitations of using XR to simulate public speaking include potential motion sickness from using the headset and technical glitches related to the system. Overall, as we collectively reflected on this experience, we were able to make sense of the incredible potential and simultaneous pitfalls of engaging in public speaking in virtual reality.

Instructors can further assess and evaluate the effectiveness of this activity in several ways. First, instructors should consider the unique needs of their classroom and best adjust this activity based on students' learning goals, strengths, and weaknesses. There might be students who do not feel comfortable participating in the XR simulation, so instructors are advised to listen and adjust to students' requests to the best of their ability. Second, instructors should evaluate students' engagement with the XR activity during the in-class exercise, co-participate with them, and allow them to explore the potential of virtual reality at their own comfort level. This activity might give students the opportunity to experiment with types of speeches that they normally would not be able to engage with and get a feeling for what that type of speech might look like. Finally, instructors could assess students' learning by providing opportunities for sensemaking and reflection both at the individual and collective level. Instructors could ask students to complete an online discussion on the university's learning management system, which would allow them to share their opinions and discuss their experience with their peers. Instructors can also encourage students to use VirtualSpeech on their own to practice upcoming speeches or complete additional exercises to work on specific delivery skills.

Limitations and Future Research

Despite XR's potential for positive contributions to the classroom, considerations must be made regarding its limitations and opportunities for future research. First, this activity reflects my experience as an instructor and does not include students' data. In the future, it would be useful to develop a study and collect public speaking anxiety scores before and after the XR activity. This would allow researchers to quantify the extent to which XR activities can lower students' public speaking apprehension level. Though students' opinions were generally favorable, future studies should replicate this activity and include pre- and post-tests of students' public speaking apprehension levels to examine

concurrent and longitudinal associations among scores.

Second, despite the promising findings, XR has only been found to reduce state-like anxiety (i.e., a temporary state) and not trait-like anxiety (i.e., a permanent and generalized level of anxiety). Because of the situational, context-specific, and temporary nature of public speaking settings, the effects of virtual reality exposure therapy decreasing public speaking anxiety only apply to individuals who experience state-like public speaking anxiety. Future studies might consider expanding VRET applications to trait-like anxiety situations to help individuals manage generalized levels of anxiety that apply to other interpersonal contexts.

Finally, it is important to consider the accessibility and availability of XR technology, given that not every institution has a virtual reality lab with compatible headsets. Current trends in higher education suggest that virtual reality technology is not only becoming more common and accessible across departments, universities, and institutions, but also that the prices of these technologies have significantly decreased over time compared to when they first came out. There have also been initiatives worldwide to increase accessibility of virtual reality through donating equipment, funding virtual reality labs, and "democratizing" this technology, such as the initiative promoted by the VR First Consortium (https://www.vrfirst.com). In some cases, virtual reality technology might already be available at one's institution, even though faculty members might not be aware of it or might be skeptical of its integration into the classroom. Sometimes, only some departments have access to XR technology equipment. Identifying ways to promote the interdisciplinary use of this technology can facilitate inter-department collaboration and incentivize institutions to apply for national and international funding opportunities to access this technology. Furthermore, recent research suggests that XR technology is becoming more accessible through the use of smartphones, which could significantly lower or remove barriers related to institutional equipment, licensing, and funding for this type of activity (Stupar-Rutenfrans et al., 2017).

Conclusion

Augmented, mixed, virtual, and other extended realities are here to stay and are transforming how individuals learn, interact, and work. As immersive technology becomes

more prevalent and accessible across disciplines, and especially in higher education, it is important to acknowledge and consider that many questions remain unanswered. Issues related to accessibility of this technology, collection of users' personal data, and potential side effects for individuals (e.g., motion sickness, fatigue) should be carefully assessed by instructors and educators to encourage a safe and responsible use of this technology.

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Appendix A: Supplemental File

1. **Instructions for Setting up a Meta Quest Account**

    1. Create a Meta Quest account using an email address. Students can create an email address to use only for this activity and do not need to use their personal email address.
    2. Have students install the Meta Quest mobile app on their smartphone.
    3. One Meta Quest account is needed per group of students.
    4. At the end of the activity, students should log out from the Meta Quest account and from the headset. If the activity is done in an XR lab, instructors are encouraged to talk to the lab staff to ensure that all personal information and data has been deleted from the headset.

2. **In-Class Activity**
    1. Complete the headset setup and ensure that screen sharing is enabled.
    2. Download the VirtualSpeech app to the headset if not already installed.
    3. Divide students into small groups of three or four.
    4. Remind students that their participation is encouraged but not mandatory. Acknowledge that individuals react differently to XR and immersive technology.
    5. Allow time for setup and adjustment of the headset (about 5 minutes).
    6. Explain the in-class activity and share possible exercises. See the full list of practice exercises on the VirtualSpeech website.
    7. Have students practice giving a speech that they previously prepared during the semester in front of a virtual audience of their choice.
    8. Set up a timer for 15 minutes for students to try the VirtualSpeech app.
    9. Every 15 minutes, remind students to rotate and give the headset to one of their peers.
    10. Walk around the Lab and check in with students as they try VirtualSpeech.

3. **Post-Activity Assessment and Individual Reflection**

The following is an example of a post-activity reflection activity for students:

Take time to describe and reflect on our experience in the XR lab. Please answer the following questions:

a) How would you describe your experience trying the XR technology in the lab as part of our public speaking class? What were some of your key takeaways?
b) Compare giving your speech to a real audience versus a virtual audience. What were the pros and cons of delivering your speech in front of a virtual audience?
c) What were some of your favorite things about the VirtualSpeech app? What were some of your least favorite things that could have been improved upon?
d) Thinking about the way technology (specifically XR) is revolutionizing higher education, what are your thoughts about the potential integration of XR in a class like public speaking? What might be some of the unique benefits and opportunities? What might be some of the challenges?