



Augmented Reality in the English Composition Classroom: Teachers' Experiences and Pedagogical Implications

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Abstract: The integration of innovative technologies in educational settings has been encouraged and heavily studied in fields such as applied linguistics and rhetoric and composition studies. Although technology has been identified as an effective means to teach multimodal composition, educational uses of emerging tools such as augmented reality have mostly been studied in the medicine and science domains. This report narrates how collegiate composition instructors imagine designing and integrating augmented reality technology for multimodal teaching in their instructional contexts. Participants attended a training workshop where they were introduced to augmented reality mobile technologies and then were tasked to design lesson plans for their own composition classrooms. This report describes the instructors' experiences with the goal of discussing the potential uses, benefits, and limitations of this technology for addressing multimodal composition and incorporate critical topics such as language variation and accessibility in writing classes.

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Introduction

Since the term “multiliteracies” was brought up by the New London Group (1996) as a rebellion against structuralist views of literacy that positioned writers as “decoders of language” rather than “designers of meaning,” there has been a significant shift in the field of writing instruction towards more flexible and realistic views of language use, and a focus on the process of composing texts as a form to create meaning. Centered on the idea that communication inherently involves a multiplicity of modes that influence meaning-making processes directly (Jewitt, 2014), the concept of multimodality has been widely accepted in the field of composition studies. Multimodality specifically refers to incorporating multiple modes of communication and semiotic resources as a toolkit that writers can access to expand their expressive potential in writing (Belcher, 2017).

The rising trend of creating culturally relevant and equitable educational environments has impacted multiple fields, including English composition. From the Conference on College Composition and Communication Convention’s (CCCC) resolution about students’ right to their own language, to Asao Inoue’s address at the 2019 CCCC conference in Pittsburg, where he urged writing instructors to step out of their comfort zone and challenge white supremacy in the field, there has been a consistent call to exercise anti-racist pedagogy as a way to dismantle the oppressive educational system that marginalizes minority English users. Multimodal composition is a powerful tool in this quest, as it allows writers to exert their identities, experiment with non-traditional modes, and exercise their agency; which innately challenges monolingual practices in English composition that limit writing to traditional alphabetical modes (Tardy, 2005). Although there is an extensive body of literature that explores how technology can enhance and facilitate multimodal composition (e.g., Hafner, 2014; Oskoz & Elola, 2016), the use of augmented reality (AR) as tool to teach multimodal composition has not been thoroughly explored yet. This report describes the experiences of six composition instructors who were introduced to AR as a tool for the composition classroom. The goal of this report is not to engage in a conversation about the effectivity of this technology, but rather to discuss the potential uses, benefits, and limitations of using AR for multimodal composition to address critical issues in writing instruction in a collegiate multilingual setting.

Augmented Reality in Education

In the context of higher education, technology is becoming more and more pervasive. In recent years, there has been an increasing use of technology in education due to lower cost and availability (Lawrence, 2016). These changes have led educators and researchers to experiment new means for teaching and learning with technology in a variety of subjects. AR is among those emerging technologies that are expected to

have a significant influence in instructional contexts (Kessler, 2018). AR refers to an interactive experience that fuses the real world with the digital world through the overlay of digital content. This technology offers multimodal opportunities where students are immersed in an environment with varying modalities, including auditory, visual, and haptic modes. Currently, educational applications of AR have been mostly limited to the fields of science and medicine with promising results. For example, Klopfer and Sheldon (2010) discussed how mobile and game-based AR can be used collaboratively to investigate issues of climate change. Similarly, Bressler and Bodzin (2013) looked at how students' use of a mobile-based forensic science AR game contributed to engagement and supported students' collaborative skills.

Despite the growing interest in educational applications of AR, there is a paucity of research investigating how it can be integrated into English writing courses. Wang (2017) looked at how AR-based learning materials could benefit high school students' acquisition of Chinese writing skills. Results indicate that AR helped intermediate-level learners in terms of article structure and wording while also enriching their ideas. Liu and Tsai (2013) conducted a case study investigating the use of AR-based mobile learning materials in an English as a foreign language composition course at a higher education institution. The findings show that the English words and expressions provided by the AR-based materials expanded participants' vocabulary repertoire and produced meaningful essays. All in all, studies focusing on AR for the English composition classroom are scarce and more research is needed, both from a student and teacher perspective, to better understand the possible uses of this technology in educational contexts.

Tools for Creating Augmented Reality Experiences

Two popular educational applications (apps) of AR are HP Reveal (<https://www8.hp.com/us/en/printers/reveal.html>), formerly known as Aurasma, and Metaverse (<https://studio.gometa.io/>). HP Reveal is a free-to-use marker-based AR app for mobile devices. Marker-based AR anchors the digital world to the real one through a marker or symbol that triggers the digital experience. The creation of AR experiences in the HP Reveal app is fairly simple. The user identifies a trigger element and takes a photo of it with their camera. Next, the user selects a digital overlay (e.g., an image, a video, etc.) from the HP Reveal library or from their own smartphone device and applies the overlay to the photo of the trigger element. Once the created experience is saved, it can be viewed with ease by pointing the mobile device camera to the real-life element of which the picture was originally taken. Starting January 2020, HP shut down the HP Reveal app, however the findings of this report are relevant to other AR apps that can be used for educational purposes.

Metaverse is another app that uses marker-based AR; however, it presents a comparatively complex interface. In Metaverse, AR experiences are enabled through web links and QR codes created on a computer browser and then viewed on the user's device through the mobile app. Different from HP Reveal, Metaverse also includes

assessment components (e.g., multiple-choice questions, text entry, image submission, etc.) that can be integrated into AR activities. In this report, both apps were introduced and incorporated by the participants in their multimodal composition lesson plans.

Methodology

Participants

The participants of this study were six composition instructors from a writing program at a university in the Southwest region of the United States. The writing program at this university offers foundation-level composition courses with special emphasis on second language writing, and upper-division technical writing courses. Although all classes have different learning outcomes depending on the level, they all follow four major course goals: rhetorical awareness, critical thinking and composing, conventions, and reflection and revision. The findings presented in this report mostly focus on achieving the goal of enhancing critical thinking and composing.

Instruments and Procedures

Since the writing program has a curriculum that embraces technology use, multimodal composition, and culturally relevant pedagogy, a professional development workshop was designed to introduce writing instructors to AR mobile technologies and explore how they envisioned using this technology to enhance multimodal composition and address critical conversations in the classroom. Prior to the workshop, participants completed a brief Qualtrics survey assessing their knowledge and previous uses of AR for teaching purposes. Following, participants received a 30-minute training where they were introduced to HP Reveal and Metaverse. Participants learned how to create AR experiences using these apps and looked at some examples created and implemented by a writing program instructor who had previously used the technology in her foundation-level composition classes. After the training session, participants were asked to work in pairs to design their own lesson plans. They were asked to include learning objectives of the proposed activities, classroom implementation details, and important considerations for teachers who could use these materials in the future. After the lesson plan development, participants completed a brief survey about their experience with AR and they took part in a focus group discussion further discussing the perceived benefits and limitations of this technology. Qualitative data are presented and discussed in the next section.

Results and Discussion

In this section we report teacher participants' perception of the use of AR for English composition courses and their recommendations for incorporating AR in writing

instruction. We also showcase two sample lesson plans created by the teacher participants to demonstrate AR's potential for multimodal composition and addressing critical topics.

Teachers' Perception of the Benefits and Limitations of AR

The findings indicate that participants showed an overall positive view of using AR technology in composition classes. Benefits identified by teachers include engagement, unique teaching approaches, providing students with space to work in other modalities, and adding depth to their work. A participant reported: "When used in the composition classroom, AR could encourage students to rethink their rhetorical situation and communicative approaches." This is a central benefit of AR since through this technology student can begin to reflect on how communication can occur through multiple modalities and in different ways. Considering the interactive aspect of AR, and the fact that users need to use their mobile devices in various ways to explore content (e.g., through haptic, visual, and auditory senses), students can engage in new learning multimodal processes. A participant stated that AR apps could fit into her English course because a multimodal project was already part of the curriculum, and this technology would add a new layer of complexity to the class. Another participant reported, "I might offer AR as an option, with support, for multimodal aspects of projects like the website redesign and website portfolio projects." All in all, English teachers identified several benefits after taking part in the workshop and developing lesson plans, showing that there is great potential for using AR to increase multimodal meaning making in English composition courses.

On the other hand, although participants were excited about the potential affordances of using AR in their classes, they also expressed concerns about the justification of the use of the selected technology, as well as accessibility issues with the apps. During the focus group interview, participants reflected on the importance of using technology for purposeful reasons, and some teachers felt insecure about how to explain the educational benefits of AR, as opposed to traditional two-dimensional videos, to students. In fact, some students may merely see AR as a "cool new trend," and not as an educational tool. In addition, considering the learning curve of new technologies, one of the writing instructors foresaw a "difficulty in finding a way to balance the achievement of course goals with the learning curve of the tech." In a similar way, participants raised issues of accessibility with the apps regarding compatibility with screen readers, lack of video captioning, and the possibility of students not having modern smartphones compatible with AR apps, or simply not feeling comfortable with creating an account in the app for privacy reasons.

Teacher Lesson Plans and Pedagogical Implications

As part of the workshop, participants designed sample activities using HP Reveal and Metaverse. In this section, we present two sample lesson plans created by participants where the AR technology was incorporated for engaging students in multimodal composing and critical thinking. These two sample lesson plans were

selected because of their ease of adaptation into the participants' curriculum, the strong pedagogical design, and the focus on critical topics. Although they were designed for HP Reveal and Metaverse, these activities could easily be adapted to other AR apps on the market.

Lesson Plan I: Exploring Varieties of English to Challenge the Standard

Context: This activity is part of a bigger research project in which students explore the power of prestigious English varieties in the United States or abroad and the consequences of such power structures in society by conducting a bibliographic research of academic and popular sources on the topic. This project is designed for a foundation-level composition course where the main focus is to enhance rhetorical awareness, critical thinking, and composing through research.

Purpose of the activity: Students create an interactive map to show multiple varieties of English across the United States (and/or around the world).

Required materials: Smartphones or tablets, Metaverse app.

Suggested reading materials: Lippi-Green, R. (2012). *English with an accent: Language, ideology and discrimination in the United States*. London: Routledge.

Prior considerations: Before assigning this activity, you should introduce the topic of language variation and its connection to power. You can start by asking students to reflect on the language(s) they speak at home versus the language requirement(s) in academic settings. Have a class discussion about language and power and list possible English varieties in the region where you teach.

Instructions:

1. Divide your students into groups. You can either work as a whole class, divide the class in half, or assign regions of the United States to smaller groups.
2. Students need to identify local varieties of English spoken in their assigned/selected region. They will research the characteristics of this variety and will create videos describing and/or exemplifying those characteristics. Students can also find videos of English users of that variety instead of creating their own.
3. Using a map of the United States (or region they are researching), students will create AR experiences that trigger the videos they

created or selected. For example, when scanning with Metaverse the QR code placed on the state of Alabama in the map, a video of an English user of this region and a description of the characteristics of Alabama English(es) will show up. Students should be encouraged to identify and show differences in vocabulary such as bubbler versus water fountain, accents, and other linguistic features.

4. The final product should show multiple English varieties used in the United States, which can serve as evidence that standard American English is not the only valid variety in the country and prompt a discussion about the value of the standard in certain contexts over others. You can link this discussion to rhetorical choices in connection to purpose, audiences, and contexts.

This activity supports multimodal composition as it allows students to engage with multiple modes of communication including images, audio, and text to express ideas and examples about language variation. By being exposed to multiple varieties of English, students visualize the existence of language varieties beyond the standard. This will address the issue of erasure of non-prestigious English varieties and will help students engage in critical conversations about language and power.

Lesson Plan II: Exploring Issues of Accessibility in your Community

Context: This activity is a smaller piece of a major student project that involves research on accessibility within a community. The final deliverable will be a multimodal AR-enhanced report. This project is designed for an upper-division technical writing class that focuses on rhetorical awareness and critical thinking and composing in professional settings.

Purpose of activity: Students identify and discuss issues of accessibility in digital and physical spaces in their communities.

Required materials: Smartphones or tablets, HP Reveal.

Suggested reading materials: None.

Prior considerations: Before assigning this activity, you should introduce the topic of accessibility to your class and cover lessons on conducting research (secondary research, primary, etc.). Have a class discussion on the concept of accessibility and the importance of guaranteeing access for all in physical and digital spaces. Discuss accommodations for individuals with disabilities,

have a critical discussion about ableism, and go over the characteristics of what makes a public place accessible or not and how that may impact a community. Students should focus on the aspects that grant or deny accessibility such as semiotic resources, language use, physical spaces, socioeconomic background of users, etc. You could have small practice field trips on campus to have students identify accessibility issues within the college community. For example, our university library is under renovation so this could be an easy spot to identify accessibility issues - the main accesses to the building are not accessible by wheelchair, there is constant noise pollution, and the free resources typically offered are significantly restricted. In the case of digital public spaces, you can have students browse through selected websites and determine if they are accessible or not.

Instructions:

1. Have students identify the place they want to explore. You can have them list places (digital and physical) that are important to their communities and create a project proposal.
2. Students will head out to a local place (e.g., grocery store, workplace, favorite coffee shop, etc.) or visit a popular website (or coordinating website to a physical space) and examine the space. Students will have to identify 2-3 spaces that are accessible or inaccessible, snap a photo of those spaces, and do an overlay over that space/image that talks about the accessibility of the space. They will need to include spaces that are both accessible and inaccessible to certain groups, think about what is done well, and what can be improved.
3. Students will then create a multimodal report where they discuss their findings and enhance the report with the AR experience(s).

The final product of this activity is a multimodal report of the students' findings. This will allow students to engage in multimodal composition since they have to enhance their written report with images and videos using the AR app. Students' final work includes trigger images that reproduce videos to enhance the information presented in the report and create a more vivid experience for the reader. Having students critically explore the level of accessibility of physical or digital spaces within their community will allow them to engage in critical conversations about diversity and inclusion through the lenses of accessibility.

Pedagogical Implications Explained by the Teachers

During the focus group discussion, participants were asked to discuss the pedagogical considerations and implications teachers should consider when using AR-enhanced activities in the composition classroom. The following is a list that summarizes the most common trends and ideas presented by the instructors.

- Invest class time to train students to use the apps. You can create small classroom assignments where students use the apps to get some practice creating AR experiences. A good way to start is to have them create simple AR experiences in the classroom with the overlays offered in the app, and then move on to more complex experiences where students use their own video overlays and QR codes.
- Examples will be central to show students what you are expecting them to do with AR. In the case of the first activity, you could choose the city where you are from and use your English variety as the first example on the map. In the second activity, you could either create a sample report of an accessibility issue that you have identified or create a mock example where you give suggestions on how to use trigger images and video overlays to enhance multimodal reports. Consider that students will need significant scaffolding not only to create the AR experiences, but also to be able to identify what makes a place accessible or not, and what exactly is an English variety. In the particular case of exploring digital spaces, teachers should consider other technical skills students will need, such as taking screenshots of websites.
- Assessment expectations are an important part of the project as this will clarify what students will learn. Provide specific guidance about the number of AR experiences students are expected to create, how long the overlay videos should be, how much information about the language variety/accessibility issues you want to see, etc.
- Give students enough time to work on their projects so that they have time to practice with the apps and check multiple drafts before their final submission.
- Provide alternatives for students who are not able to use the AR apps or do not feel comfortable using this particular technology.

Conclusions

AR is a technology with great potential to enhance multimodal composition and can also serve as a tool to explore critical issues. In this report, we discussed composition teachers' opinions and experiences designing lesson plans to illustrate the practical pedagogical applications of AR for the higher education setting. In this study, writing instructors recognized that AR can provide students with new learning opportunities that go beyond "flat" information, as usually found in printed materials. Based on these findings, we recommend that English composition courses should consider integrating multimodal digital technologies such as AR to create new modes of learning and engage students in multimodal projects and genre innovation. To guarantee the effectiveness of technology integration, however, activities must be properly designed, and the technology must be clearly presented to students as an educational tool.

Nevertheless, it is also important to consider significant limitations, including the unpredictability of the AR industry. As with other technological apps, the AR industry moves incredibly fast and sudden changes with app availability tend to happen. For

example, during the time of data collection HP Reveal was a trending AR app used in the field of education, but it was abruptly taken off the market in early 2020. Although there are similar AR apps, these sudden changes may become a significant burden for instructors incorporating this technology since it means starting over when adopting new apps. In the same way, the accessibility issues discussed in our findings may represent a substantial challenge in some learning contexts.

Future empirical studies will need to further investigate how AR can successfully be integrated into English composition courses to enhance motivation, learning, and engagement. Other questions that need to be further investigated include the effectiveness of AR in terms of learning outcomes for multimodal composition and learners' perspectives on the adoption and integration of AR technology in the English composition classroom.

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