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THE USE OF IMMERSIVE AND INTERACTIVE FILMS TO AMPLIFY TRADITIONAL PEDAGOGY AND ETHNOGRAPHY

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ABSTRACT

The current use of film in undergraduate anthropology classes has been employed to enhance class lectures as well as to vary teaching methods. The goal of this study was to create a design for a set of immersive and interactional films to supplement active pedagogy. A primary research question was asking what is the value of mixing written ethnography with watching video in what is known as an "add-on" approach in a class on ethnography. The outcome was to amplify the existing pedagogy by creating media, particularly films, that enable students to apply fieldwork experiences through mediated immersive experiences in and beyond their classroom settings. Guided by explicit foundational learning theories and developed with special technical requirements such as 360-degree video cameras, we created a design for media that offers an experience that richly weaves into the course experience. Through active, kinesthetic learning, the media facilitated information processing from the learners' short to long-term memory. The results show that intentionally created media aligned with proper course design can produce immersive experiences for students, enabling them to produce thick descriptions of the social worlds they encounter. The study should be read concerning limitations related to the effects of VR technology on viewing content, which include the potential for creating a disorienting effect producing nausea and discomfort.

Keywords: Ethnography; Informal Settings; Immersive Education; Active Pedagogy; 360 Technology.

INTRODUCTION

This study aims to produce evidence and research-informed media for teaching undergraduate students. More specifically, this project aims to produce media geared toward classes that require their students to have immersive experiences such as anthropology, sociology, political science, education, and design. We call our approach for an engaged pedagogy for undergraduate students in the above-mentioned disciplines, informal immersive ethnography (IIE). The most common uses of media such as videos have been offered to complement traditional pedagogy such as lectures and note-taking to "mix up" teaching methods with unclear connections to class learning outcomes (Rodriguez & Koubek, 2019). This "add-on" approach was unsatisfactory to PA (primary author) who taught a foundational anthropology class called Ethnographic Thinking.

The PA's experiences teaching anthropology to undergraduate students challenged him to think about what is the utility of using different methods i.e., videos more than "mix-up." The PA felt challenged to articulate how his method advances the class learning outcomes such as demonstrating critical knowledge of concepts and ethnographic research methods and appraising the potential and pitfalls of ethnography to mention but a few. Other challenges that we will fully discuss in later sections include the logistical and technological constraints in creating opportunities for undergraduate students to immerse themselves in ethnographic experiences. Both instructors and students find it difficult to participate in traditional ethnographic experiences that involve field trips outside the classroom because

of logistical and administrative constraints. These challenges of mobility have been exacerbated during the COVID-19 pandemic. While 2D videos can be used to substitute traveling to locations, they offer little immersive experiences. Video content culled from YouTube is usually of low quality, created for different purposes, and offers limited immersive experiences as compared to newer technology like 360-videos. Full-length ethnographic films are available but they take more time, exist as streaming services, and remain difficult to search through existing databases.

For these reasons, the authors developed IIE. The authors have observed that well-aligned instructional methods integrated with appropriate technology can be especially useful for students who are using technology as a learning tool. In addition, in the COVID-19 era where spatial movement became increasingly constrained, alternative options for connecting and content via relevant, accessible technology can be a significant advantage for many learners. Therefore, to create media that produces rich immersive possibilities and explicit linkages between film and course materials, we collaborated with our Center for Teaching and Learning (CTL) and university technology unit to produce content that aligns with those requirements. The “we” refers to two university faculty, the PA, an anthropologist by training and the second author, and an environmental chemist and science educator with over two decades of experience in the field. Therefore, we intentionally produced media that creates a dialogue between multiple aspects of the course rather than functioning solely as an instructional supplement, which we explain in the design process in this article.

The informal immersive ethnography is not a substitute for formal ethnography, but rather a complementary and comparative activity. IIE is also not a means to produce and process videos but a way of teaching and experiencing ethnography guided by explicit foundational learning theories. Ethnography is now used and claimed by many other disciplines; thus, IIE can also be a resource for these adjacent disciplines.

“Journeys to the Market (JttM)” is an example of the first intentionally created media to enhance immersive experiences for students using the design that we developed, which is the subject of this paper. Using 360 technology, the video under the theme of market journeys, explores the cultures of markets in Bagamoyo, Tanzania. The goal was to provide an interactive method for students to explore the cultures of markets and further examine their meaning and applications in a comparative frame. In the Ethnographic Thinking class, and other classes the PA taught, the market was featured as a topic or theme; thus, it made pragmatic sense to begin with it. The first JttM video was produced in an urban Tanzanian market in the fishing town of Bagamoyo (population in 2011 was 80,000). The video provided students with an enhanced ability to immerse and observe market rituals, behaviors, sounds, and sights that constitute these social spaces. In addition, we built the idea of comparisons whether a similar topic like markets is explored in two or three cultural contexts.

We do not pretend that comparison or using what has been referred to by Pina-Cabral and Passaro (Quoted in Gupta et al., 1997) as “comparable facts" is a benign mode of knowing. Passaro argues comparing topical or disciplinary areas leads to particular kinds of knowledge that flatten complexities and ephemeralities that might not fit into existing categories and modes of comparisons (Gupta et al., 1997). We concur that by defining markets, we might foreclose what markets mean for people in different places or even unintentionally suggest that US or Chinese markets are the standard to judge and value other markets. Our intention rather was to give our students a staple of anthropological thinking such as valuing variations, “partial truths,” indigenous concepts, indeterminacy, “webs of meaning” and ambiguity (Clifford & Marcus, 1986). We are not using IIE as a replacement for other forms of teaching but to enrich ways ethnography can be experienced, illuminating important social questions and providing connections between theory and application.

Creating the possibility for students to engage in virtual fieldwork cannot be separated from issues of ethics, power differentials, and representation (Clifford & Marcus, 1986). If IIE can restrict certain analytical avenues, it can simultaneously open avenues for seeing “others” as exotic objects. Exploring “Oriental” and “African markets'' can create opportunities for voyeurism. This happens when the gaze often originating from powerful Euro-American subjects but not always, is unidirectional deployed, privileging pleasurable watching rather than learning or engaging with others reciprocally (Geertz, 1988). Since the 1980s crisis of representation within anthropology, representing the story of others—women, indigenous peoples, post-colonial subjects, and other marginalized peoples—has been a subject of heated debate and reflection (Spivak & Morris 2010; Wainaina, 2019). The democratization and ubiquity of media and its attendant, albeit pernicious effects, such as “fake news” makes the issue of

representation even more pressing than before. How does the use of virtual media like 360-degree reinforce the existing representational strategies that view the Global South as a locus of banality and antiquarian traditions? To guard against and to counter this possible reading of our approach, students learn about the history of the discipline, its key debates including the 1980s crisis of representation, and its philosophical, ethical, and epistemological principles. Watching these media can be a way to return and dwell on multiplicities of representational strategies, which include written, visual, aural, and new forms that blur these distinctions.

In this article, we lay down the process of designing IIE, outlining its background, process, theoretical framework, and intended goals for teaching anthropology in the COVID-19 and post-COVID era.

BACKGROUND

This study was conducted in a small, private liberal arts US/China joint university. The university seeks to cultivate globally-minded graduates and citizens through innovative teaching, world-class research, and a commitment to public service. English is the language of instruction, though international students are required to study and achieve proficiency in Mandarin Chinese language. Insights informing this study are based on four months of teaching ten undergraduate students, two male and eight female between the age of 18-25 from different countries and ethnicities in the Fall of 2018. Focusing on ethnography in particular, the class, Ethnographic Thinking, exposed the students to ethnography as a written account, as a way of knowing, and as a research method. The instructor observed how students applied their knowledge of ethnography in examining videos, which is the focus of this paper. In particular, the instructor paid attention to how students applied concepts, terms, and principles of ethnography from class reading when watching the video. The instructor noted how the approach aided or impeded students' ability to experience and learn about ethnography.

Some of the questions that emerged teaching this class and led to the creation of IIE include:

1. What is the value of mixing written ethnography with watching video in what is known as an "add-on" approach in a class on ethnography?
2. Can changes like priming and adopting an ethnographer's attitude when watching video elevate students' experience of ethnography?
3. Can this shift render video watching as an ethnographic site of experience and discovery rather than simply adding variety to teaching methods?

In the fall of 2018, we conducted a series of meetings that brought together a faculty member, the Director of the Center for Teaching & Learning (CTL), and educational technology personnel to sketch a plan for the present study. The PA and the second author with campus resources personnel designed an approach called IIE that used media to enhance the ethnographic experience by using current immersive technology and research-based pedagogy. The CTL Director provided expertise on foundational learning theories that emphasize enabling students to analyze, apply, and compare concepts in class such as embodiment or markets. Foundational learning theories, such as information processing, operant conditioning, and social cognitive theory informed how we scripted, recorded, and processed the video. Technically, IIE will utilize 360-degree digital cameras to create the videos and high-quality audio. Unlike traditional two-dimensional video, 360-degree video allows the viewer to experience a scene in a wider format, with multiple perspectives and the ability to move to bring into focus a certain detail of a scene. In the mid-fall of 2018, the PA explained the idea of ethnography to the CTL director and technology representative highlighting the intentions of using the immersive ethnography in class. The instructor identified the initial themes that were used to create, process, and deploy the video, which coincided with the class modules taught in Ethnographic Thinking and other classes which include modules like emerging markets, public health, human-animal relations, and exclusion and suffering. NYU Shanghai's Research and Instructional Technology Services (RITS) approved the study, funded the recording of the content, and provided technical support.

LITERATURE REVIEW

To situate our study and inform its design, we engaged in scholarship about informal settings and immersive technology particularly how it relates to pedagogical settings. Informal settings are typically places where learning takes place in museums, zoos, aquaria, science and technology centers, homes, street corners, markets, coffee stands, and benches adjacent to mosques and clubs. They are also

characterized as spaces where motivation is internal, the content is variable and un-sequenced, attendance is voluntary, displays and objects are provided, learners are of all ages, and there is more diversity in the learners' backgrounds (Hargis, 2014). However, as a number of anthropologists have cautioned, categories like formal and informal can blur in some social settings (Blundo 2006; Katomero and Georgiadou 2018) and the creation or presence of informal spaces is sometimes a product of unequal distribution of resources (Degani 2017). A considerable amount of sensory stimulation, learning, and affect appears to be influenced in these "free-choice" settings (Koran, Longino, & Shafer, 1983). For many years, attention has been known to be a critical factor in learning in informal settings such as online learning (Koran, Koran & Foster, 1989). In the same analogy, learners can be identified using immersive technology in an informal setting. The challenge is to capitalize on the power of the informal setting and help learners avoid potential distractions, navigate physical limitations, and develop processing skills for immersive education.

The concept of meaningful immersive learning was advanced by Jonassen, Peck, and Wilson (1999). Relatively recent brain research emphasized how learners' affective neural networks enhance learning through motivation, engagement, and commitment to the learning process (Rose & Meyer, 2002). Immersive learning environments provide adult learners with complexity, diversity, and opportunities necessary for deep, meaningful learning. Meaningful learning, as a construct, refers to learning that is characterized as active, constructive, intentional, and authentic (Jonassen, 2000). One way to create an immersive environment is through the use of technology such as 360 technologies.

The 360-degree virtual reality (VR) is an audiovisual simulation of an altered, augmented, or substituted environment that surrounds the user, allowing them to look around them in all directions, just as they can in real life (Cipresso et al., 2018). The concept of VR began in the 1960s when described as a window through which a user perceives the virtual world as if it looked, felt, and sounded real (Sutherland, 1965). Researchers have been studying VR for more than 25 years, resulting in thousands of scholarly papers, and building a broad, interdisciplinary community (Kim, 2005). Video games supported by VR technologies are popular as they represent work-related tools for neuroscientists, psychologists, and biologists, and this study examines VR uses for education.

Intentionally created media employing 360 technologies can offer immersive and active learning avenues. There are many types of meaningful, research-based active pedagogy (or andragogy for adult learners, Knowles, 1984). A potentially powerful pedagogical approach includes providing students with hands-on, authentic experiences to challenge and connect to their prior experiences (Piaget, 1974). The more authentic the experience, the better able the learner was to incorporate into their schema for long-term memory. An early model for experiential learning is Kolb's (1984) cycle of learning, which includes the integration of knowledge, activity, and reflection. Experiential learning focuses on the theoretical framework of situation cognition, where learning is an inseparable aspect of social practice, as people think and learn differently in different social contexts. The intentionally created media keys to these active pedagogy ideas such as visiting a new market, recording and reflecting what is its social, economic, and affective significance, and then relating their knowledge to class, personal, and global concerns (Lave & Wenger, 1991). The "situation" can be enhanced by ensuring authenticity, such as the learning environment parallels the concept taught. Creating a cycle, this approach is commonly achieved through informal settings.

To enhance informal learning experiences, immersive technologies like 360-degree virtual reality can create authentic, simulated environments that address potential distractions and limitations while developing learners' processing skills. These immersive learning environments provide adult learners with the complexity, diversity, and opportunities necessary for deep, meaningful learning by engaging their affective neural networks and facilitating active, constructive, and intentional learning experiences.

REVERSING THE "MIX-UP" APPROACH

The impetus to design a virtual ethnographic approach such as IIE emerged from specific pedagogical challenges. The present study emerged from the challenges of teaching an undergraduate anthropology class in the Fall of 2018 called Ethnographic Thinking. The goal of the course was to introduce students to ethnography as an account of people, as a research method, and representation style by surveying ethnographic writings. The class depended on lectures and readings. The students read the texts, discussed the readings in groups, listened to the lectures, took notes, and watched the videos. There

was little design or conceptual links between readings, group discussion, and watching media. The instructional approach followed the established teaching approaches.

The first challenge that led to the creation of IIE was logistical. For teachers and students alike, logistical and administrative challenges make it difficult to incorporate the "doing" part of ethnography, which involves field trips. We created opportunities for traditional forms of ethnography, where students went to nearby cafes, parks, and shops. But it was not enough. Ethnographic Thinking had only one module dedicated to formal ethnography to give way for lectures. Class sessions were offered for 50 minutes which made it difficult to visit "sites" without jeopardizing students' other classes. Students have difficulty physically traveling off campus for many hours because of their schedules. With the entry of COVID-19, mobility became even more challenging because of public health concerns and shifts in peoples' interactional norms.

The second challenge was to transform the "mix-up" approach:" creating better linkages between different modes of learning. This realization also emerged directly from PA's teaching experiences in the Fall of 2018. Before the use of 360-degree videos, the instructor used media clips as a way to complement and break the monotony of lectures, readings, and group work. The class typically started with a lecture, a media break, and then group work. For example, when discussing a module titled Eavesdropping and Taking Notes, he used a YouTube video showing tourists entering a shop displaying the different pantheons of Bali's gods and demons. This video complemented Clifford Geertz's "Deep Play: Notes on the Balinese Cockfight" taught in a subsequent module. The video was chosen to link with Geertz's contention that Balinese men engaged in cock fights for cultural and psychological reasons. The cocks resembled or at least were symbols of menacing Balinese Gods, which people worshiped and feared (Geertz, 1972). This flow of learning starting with written ethnography to video was mostly unidirectional working to emphasize what was read in the readings instead of other combinations.

What are the learning and epistemological stakes of starting, always, with lectures, readings and then video, we wondered? Existing directionality also meant that the instructor emphasized ethnography as a written text rather than observing people and their social interactions. While ethnography is indeed associated with text; however, this understanding has radically changed over the years (Briggs, 2021; Hardesty, Gluckman & Hargis, 2018). After all, *ethno* means "people" and "graphic" means representational strategies, in other words, forms of representation and transcription, which range from written, visual, aural, and new emergent genres that blur the named distinctions. We aimed to expand this register to audio, video, and tactile sensations. We taught Ethnographic Thinking, a class that privileged ethnography, whose epistemology rests on learning from human experiences yet most of the classes 14 of the 15 modules were based on reading and lectures. For many students, Ethnographic Thinking is their first and only anthropology class; there is a danger that students will finish their class with the idea that ethnography is written text, often dense impenetrable text While learning its history, key debates and epistemological foundations is important, it does not mean that ethnography should be boxed into written text only. There was a need to balance and increase the experiential and contextual aspects of ethnography beyond written text or lectures.

The existing order also positioned the written text as a "master reference," a benchmark to judge what is of value from the rest of the materials. This movement from "text to media" seemed limiting, mechanical at times, and fragmented, not linking to class, course, or learning outcomes. We wondered what kind of useful theoretical and scholarly tensions could arise from reversing or dwelling on the media and then moving to written text. Indeed, creating these different movements guided by explicit learning intentions could enrich the pedagogical experience for students.

The third challenge that created the impetus for this approach was our dissatisfaction with the quality of the video and its conceptual design. The video clips used in the Ethnographic Thinking class came from YouTube. Public-produced videos resonate with anthropological tradition and ethics of prioritizing the subject and the everyday practices, what Malinowski called the imponderabilia of everyday life, but their quality and topics did not always align with course learning outcomes (Malinowski, 1922). It is understandable, that the intentions of YouTube authors are not our own and don't have to be. Our aim is to introduce students to ethnography, its history, its various debates, and applications to understand social conditions. Many public videos are not built from evidence, theory, and technical requirements for creating a rich immersive learning experience (Muslem, A., & Abbas, M. 2017). In the early weeks of Fall 2018, the PA struggled to make nuanced analytical and topical connections between the readings

and the videos. The work to make linkage between the readings and the videos fell heavily on the instructor because of the design of YouTube videos (Alhrahsheh et al.2024).

To address these challenges, both logistical and pedagogical, the primary author (PA), began experimentation with existing videos and design as a space to experience the contextual dimensions of ethnography. These attempts led to the creation of IIE. In the beginning weeks of Fall 2018, PA typically sourced videos to match the weekly class theme, a debate, or a key concept. While this method created a variation in responses, it sometimes ended as a matching exercise, i.e., comparing the ideas in the readings to what is seen in the videos. Matching is an important pedagogical skill because it requires students to apply a reading or theory and an action and then identify in a different context. However, this approach did not compel the student to take the videos as significant sources of information and insights in their own right (Boellstorff, 2015). Also, this approach did not facilitate students' roles in discovery, which may contradict, exchange, or even refine concepts and argument's author is proposing in their texts.

In the middle of the semester, the PA offered a checkpoint to ensure students satisfactorily acquired baseline knowledge on what ethnography means. He then assessed whether students would be any different if he were to prime them to imagine themselves elsewhere as anthropologists. The PA drew his inspiration for priming from Bronislaw Malinowski now famous phrase "Imagine yourself suddenly set down surrounded by all your gear, alone on a tropical beach" as well as other anthropologists' interpretation of the term especially for virtual ethnography (Boellstorff, 2015; Malinowski, 1922).

The PA reversed the flow from reading to media by encouraging the students to adopt a certain frame of mind: "Imagine [themselves]" (Geertz 2017; Malinowski, 1922). Malinowski in his now common phrase is simultaneously calling for a movement away from "home," to engage in a new place, and to embody an ethnographer's identity. Instead of imagining themselves on a tropical beach in Trobriand Islands, the PA verbally encouraged the students to treat what they were watching, either a Black Lives Matter march in Gainesville, Florida USA or the assembly line of Tesla in Shanghai, China as a field site. The PA urged students to temporarily suspend themselves away from the class to the site and engage with the reality in front of them as anthropologists, virtually alone (Boellstorff, 2015). Being virtually alone or "being there" entails observing the scene, and paying attention to other people (subjects and yourself), the environment, attires, sounds, and spatial-temporal patterns (Geertz, 1988). It's about "being there" in the scene and becoming an observer in it.

This exercise was not a total plunge into the "natives' way of life" as Malinowski would put it. Rather the PA offered guidance, priming, and guiding questions. In class, before the students began watching the video, the instructor verbally primed the students with the prompt, "Imagine that you are an ethnographer now visiting these places, peoples, and events." This approach was taken to help guide students. Specifically, the instructor the student to take on a point of view as an ethnographer observing, examining and interpreting socio-political and social dynamics underpinning realities like street children in a Mumbai train station; a shopper in Shanghai Wumart; or a Mongolian shaman treating a Russian female patient.

The PA also provided students with guiding questions that directly linked to the weekly class reading and encouraged new reading and interpretations of the media. For example, students were asked to relate anthropologist Joao Biehl's concept of social death to their experience of observing "abandoned' street children living in the Mumbai railway station (Biehl, 2005). In tandem, they were encouraged to think through careful dwelling and observation in their sites, the videos projected on a screen, and how pre-existing concepts like social death fit in these new scenarios or need to be reconfigured to accommodate new empirical realities. This is what we have called reversing the readings from written text to media, which is a typical way of teaching in many classes.

The PA noticed some changes in students' learning. This active learning approach resulted in the students making more descriptions and analyses of the situation than previously when the PA offered lectures, media breaks, and group discussions. For example, a student noticed that fully clad Muslim women in slow-moving cabs gave more alms to the street children living around the Mumbai railway station. Another student connected Biehl's concept of social death, noting that it did not seem to apply to the Mumbai's Street children because while they lived in the railway station, with a marked territory, guards, and in and out points, the children were relatively free to move. They were not confined as prisoners, and some people still cared for them even if temporarily. So, the social, peoples' care or even

distanced relations, was alive and not dead. By shifting the point of view and the self, from a student to an ethnographer, more observational details were emerging from students. This new approach resulted in lively discussions and richer responses evidenced through formative assessment such as questions from the instructor after screening of the videos and in written assignments.

Despite the assessment of students' changes in how they used media in their learning and experiencing ethnography, the evidence rests chiefly on the instructor's point of view. It assumes that students' adoption of the ethnographic gaze yielded more “thicker descriptions” rather than a combination of factors. Ideally, systematic evidence such as students’ written testimonies, interviews, and direct measures via artifacts were needed. Based on student feedback and discussions with other colleagues, the PA began to design teaching experiences that could use emerging media to replicate the two-dimensional experience. In the past, the PA sourced the videos from YouTube and other copyrighted sources to complement the classes. The new, updated approach would involve creating opportunities for students to have an immersive experience, which would be connected and instructor-produced three-dimensional video.

FROM CLASS EXPERIENCES TO IMMERSIVE FORMAL ETHNOGRAPHY

The new approach, what is now called IIE, the authors build from this early experience and from theories of learning that show interactivity, a linkage between different attitudes, methods, and immersion can result in effective learning. Scholars define effective learning as a climate of inquiry where students feel appropriately challenged and activities are linked to research (Jenkins et al., 1998). Starting with a video or asking how the contents of the video connect with the readings challenges students. Our goal is to make research, scholarship, and artistic creation a central component of both undergraduate and graduate education. The method for this is through a movement away from traditional lecturing to a more inquiry-based learning (IBL) and problem-based learning (PBL) approach. In these methods, problem-solving, joint projects, teamwork, and cooperative learning are emphasized. Often such IBL approaches are well served by the Socratic method; information processing model and meaningful use of instructional technology.

SITUATING IIE IN ETHNOGRAPHIC AND LEARNING THEORIES

The design of IIE engaged more substantially from ethnographic and foundational learning theories. In achieving our learning goals, we did not want to dilute and ignore the questions about the currency and rate of exchange of ethnography as it migrates from one disciplinary domain to another or in practices like teaching (Fabian & De Rooij, 2008). We thought carefully, as other anthropologists and educators have done before, what does it mean or what are the effects of migrating ethnography into virtual domains and what is the role of foundational learning theories, or vice versa, in teaching ethnography? In this first section, we flesh out the theoretical underpinning of IIE.

ETHNOGRAPHY: CHANGING NOTIONS OF TIME, PLACE AND SPACE

In the past several decades there have been several transformations to the classical ideas of ethnography, which has opened creative forays into virtual ethnography like IIE. The field of ethnography has widely expanded from its earlier connections with the study of exotic, non-European, and faraway communities (Gupta et al., 1997; Malinowski, 1922; Mendoza-Denton, 2008). Now anthropologists consider sites, any spaces not necessarily geographical, that are rich in social and cultural life from subway stations, and autonomous vehicles to online virtual games like Coming of Age in Second Life as legitimate objects for their exploration (Boellstorff, 2015; Hargis & Canbek, 2011; Vinkhuyzen & Cefkin, 2016; Yee & Hargis, 2010). The use of virtual sites has not only expanded the gamut of field sites, in all their connotations but also generated interesting theoretical and ethnographic questions. Online communities have provided useful empirical and social terrain to revisit older anthropological concepts like kinship, virtual, real, and morality as they are normatively understood (Boellstorff, 2015).

The “graphic” part of ethnography has also been a site of several innovations. Ethnography does not simply mean monographs but includes films, photographs, mixed media, computer visualization, and other forms of representations (Pandian & McLean, 2017; Sherine & Coleman, 2017). Virtual Reality (VR) can function as both a means to observe the phenomenon of interest as well as an account in its own right if we mean writing as a system of representations. It is becoming accepted that video, graphics,

or computer simulation are cultural texts and can be an “instrument of knowing” (Ortner, 1995) but also a product of anthropological research, in other words ethnography.

Despite these changes, certain key kernels of what constitutes ethnography remain central such as spending time and space with one’s subject through observation and participation. Bronislaw Malinowski, the key figure of anthropology called it total immersion, engaging in ethical and systematic observation and documentation of one’s experiences in the field (Malinowski, 1922). Virtual games and VR technology enable these dimensions of ethnography, where the user spends time with his or her subjects observing life such as attending weddings, shopping, and creating crafts. These theories and developments within anthropology inform our thinking about IIE.

Despite logistical and administrative constraints that students and faculty face and challenges of immersive technologies such as strain on the eyes and body, we hoped that IIE could complement formal ethnography and enable students to notice, observe, and dwell more into the experiences projected in front of their eyes. In this regard, we anticipated that students would produce more “thick descriptions” (Geertz, 2017). Our definition of thick description combines the original strands of Geertz’ earlier formulation and later elaborations by other scholars (Katz, 2001). Thick description is a type of ethnographic genre that refers to a granular description of social life by offering different perspectives of the same act. For example, noting the difference between a wink and a twitch and then situating it within particular interactional contexts (Geertz, 2017). If a student in class noticed in a video that not only a buyer was exchanging goods with a seller in a market but another buyer standing behind her shook head or checking her shoes, this can be an example of “thick descriptions.” It qualifies because it offers multiple points of view. Other scholars have expanded on Geertz’s concept to include more cases of the same phenomenon than simply voluminous details of one particular case (Katz, 2001). Through priming and intentionally creating 360-degree videos, we hoped that students could produce more “thick descriptions” compared to existing “mix-up” classes.

STUDY DESIGN

METHODS

The selection criteria for the participants of the study were all the students enrolled in the anthropology course, Ethnographic Thinking at a Sino-US university in China. There were a total of 19 undergraduate students enrolled in the study coming from different cultural backgrounds. Typically, these courses have more females than males, but this study did not capture this information.

This study used a mixed methods approach to understand the difference between two-dimensional (2D) and three-dimensional (3D) video in creating an immersive experience for students. Students were asked to keep field notes during their exposure to 2D and 3D. For the field notes the students were asked to record their impressions and experiences of watching 2D and 3D videos. After viewing videos in each format, students were asked to respond to a survey, which asked one quantitative question about how likely the student would recommend the activity to others using a scale of 0-10. A second question was provided, which included a qualitative, open-ended question, which asked the students to provide the reasons for their score from the first question.

We utilized thematic analysis to scrutinize the data extracted from both the fieldnotes and survey responses, aiming to address our central research question: Whether 3D videos generate a more immersive experience, as indicated by rich, descriptive accounts. Our process involved carefully examining the materials, seeking recurring themes and patterns, which we documented and subsequently evaluated for consensus or discrepancies (Creswell, 2014). Key quotations encapsulating the prevalent themes were identified, enriching our analysis with vivid examples. To enhance the clarity and depth of our findings, we supplemented these quotes with pertinent contextual information.

Using content shot in a local market in Bagamoyo, Tanzania, the PA created identical video clips one being in 360-degree video and one in traditional 2D format. The content was created to align with the market and environment course module. The videos were informed by foundational learning theories to improve the ability to analyze and compare, which is a critical component of writing thick descriptions in anthropology, which was the skill being practiced in the course.

The content used in the study was created in collaboration with a community-based artist organization in Tanzania called Bagamoyo Martial Arts and Film (BAFIMA). It is a registered artist collective working to blend martial arts with acting and drama. BAFIMA itself is a community organization that uses the arts to create a mirror reflecting some of the most pressing challenges facing Tanzania today, such as gender violence, youth unemployment, environmental destruction, and family planning. The PA is a member of this art collective. His film "TIJA," focusing on the lives and trials of community health workers, is an example of a previous collaboration where the artist took the first authors' ethnographic research findings, turning them into a fictional dramatic film for broader circulation.

CTL provided their expertise on design and conceptual framework that guided the production of the video clips and the study that followed it. We created four 360-degree videos, but this study only refers to the market video. The market video was captured through a Rico Theta camera mounted on a DIY helmet worn by the artists. A soundman with a Zoom H6 recorded the artists at a distance. There was also a videographer, who operated the mounted Rico camera using a phone interface. For some scenes, a stationary tripod was used, and for other scenes, the videographer moved with the tripod, following the artists. None of the authors recorded the video, although PA was present and directed the recording of the video. The videographer and the actors are all members of BAFIMA. An artist trained as a videographer operated the camera because most residents were already accustomed to seeing him record community events like weddings, baptisms, birthdays, etc. However, PA was present during the recording of some of the videos.

Prior to conducting the study, we ensured that all participants were on equal footing and familiar with the concepts of fieldwork, ethnography, and field notes. To achieve this, we took the following preparatory steps: On the Monday before the experiment. During this session, we introduced key concepts such as thick descriptions and virtual reality. The PA explained and provided examples of thin and thick descriptions, allowing them to assess and improve their own field notes. The PA provided students with examples of thick and thin descriptions, allowing them to assess and improve their own field notes. Students were allocated 30 minutes of class time to practice writing field notes on the school's elevator traffic. Then, the PA gave verbal feedback in class on field notes produced for those who volunteered. Following this, on the Wednesday before the experiment, we conducted a session on desensitization to virtual reality and practice ethnography. Assisted by two technology experts, students had an opportunity to see and use the virtual reality equipment. The sessions were brief and gave the experts some ideas on the equipment such as the fit and display of the video clip.

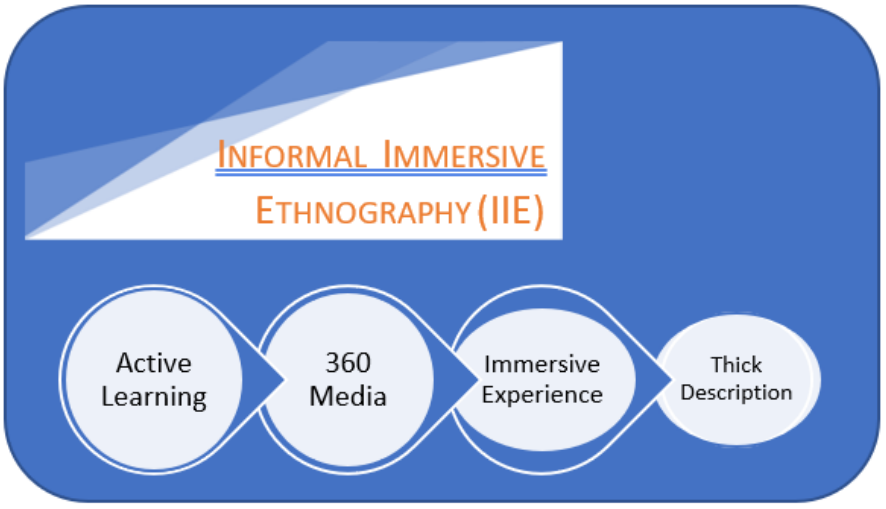

Figure 1. Informal Immersive Ethnography (IIE)

During the testing of the videos, the PA provided contextualization after the students watched the market clip. Students JH and HL were not involved during the showing of the 2D and 3D videos. Two technology experts helped to fit the VR headset on students, loading the 2D and 3D videos in the VR headset and on the desktop computers in the class. The students only watched one version of the market journey

videos. The study was interested in their first impressions of watching 2D and 3D videos before the PA answered and provided contextual information about the location, time, technology, and production aspects of the video. The students viewed the video in the classroom, and divided into two groups. One group of students viewed the 2D projected on the screen.

Another group of students in a separate classroom viewed the same video using a VR headset in 3D format. The technician was on standby to assist with wearing the headsets. The video was three minutes long. After viewing, students were given 30 minutes to write their field notes and fill the electronic survey in class. The groups were then switched. The students who viewed the 2D video were exposed to 3D, and vice versa. Then, students were given time to describe what they saw. Before splitting them, the PA briefed the students that they were about to watch videos in 2D and 3D about markets in a small Tanzanian town. The PA also informed the students that after watching the two videos, they would be asked to describe what they saw in the field note style and fill in a survey. Field notes were submitted the next day.

This study was part of an ongoing class activity. Viewing videos and writing assignments were consistent and part of everyday class instruction. The study was aimed at improving the instruction for the course Ethnographic Thinking and related anthropology classes that require field experience. Students were verbally informed about the 2D and 360 video study. They were offered the opportunity to opt-out with no penalty as well as group and individual spaces to raise concerns. Each student opted-in and provided their verbal consent.

FINDINGS

We used surveys and field notes to capture students' impressions of their exposure to 2D and 3D videos. We used a Qualtrics survey for students to fill in their responses. They completed a two-question survey, a net promoter survey, asking how likely they are to promote this experience to a friend and what is the reason for that score. The net promoter score was -14 with 38% detractors, passive 38%, and promoter 24%. The reason for the score is that 24% of the students had a good experience and would recommend the technology to fellow students, and 38% of the students would not recommend it and this is partly because of the side effects such as nausea, dizziness, and headache, the other 38% of students would neither recommend or not recommend it, so they are counted as passive. We also asked them to write a thick description of their experience watching a 2D and 3D video.

Here are some selected quotes from a student survey on “technological problems” associated with VR viewing. One student reported “I was happy with the idea of the project but not the execution. Many people were experiencing technological problems and I got a huge headache after it was over.” Another reported “I thought that Oculus VR activity was cool because it was super interactive and was much more immersive than just watching the video, however, it made me feel dizzy and I felt sick for a long time afterward.” 8 out of the 10 students who experienced the 3D videos had “technological problems.” However, Students appreciated the experience describing it as “cool”, “interactive” and “immersive’ but as the survey response shows they experienced dizziness, nausea, and headache.

The field notes also capture the same impressions as in the survey but with more fine-grained descriptions. The excerpts from students' field notes provided below suggest that they found the 3D immersive experience interesting and valuable for exploring different cultures despite the side effects of VR. Regarding the contrast between 2D and 3D videos, students expressed that the 3D videos provided a much more immersive experience compared to traditional 2D videos. They felt like they were present in the environment rather than just observing it from a distance. Moreover, students found it fascinating to embody the point of view of the actors in the 3D videos, as it allowed them to see the world through their eyes. Nevertheless, the discomfort caused by motion sickness due to VR technology made it difficult for them to fully immerse themselves in the perspective of the actors. We present some of the salient field note quotes below honing on the themes of thick descriptions, side effects, and embodiment. Despite the technological limitations, Jane's experiences of using 2D and 3D are noteworthy.

Overall, the 3D VR experience threw me into the entire sensory experience of being in the street market, especially the sounds. In the 2D experience, I focused much more on overall experience and scenery and saw different things like the buildings’ structure and organization using alleyways. Also, in the 2D experience, I saw much more of the transportation focusing on the bikes and motorbikes. In the 3D

experience, it felt more personal and I focused on the interactions with people, especially conversations with the men in the alley who were standing with the bike and the shopkeeper. It was also easier to see others' reactions to the woman wearing the camera like the woman in the shop who stared at her and checked her out for almost a whole minute. My focus tended to be controlled by the sounds I heard… I also noticed her hand, skin color, and nails only in the 3D VR experiences as I was more focused on her interactions.

Jane writes that in 2D, she was able to see more of the structures and organizations, such as alleyways and motorcycles, whereas in 3D, she felt more focused on social interactions including other actors' reactions and behaviors. The woman in the shop "checking out" the artist is an example of observing social interactions that may be difficult to observe in 2D videos because of its limited view. 360-degree videos enable users to see more perspectives than 3D, and this may be the reason that Jane credits 3D videos with offering more venues to notice social interactions. She notes that the shaky images in 3D may have contributed to this heightened focus on interactions. Consequently, she found that sound became a guide for where to concentrate her attention and observations. Based on our earlier assumptions, Jane's field notes capture rich details of the social scene she observed, including structures, street layouts, conversations, people's reactions, and technologies. Her observations provide valuable insights into the cultural context, illustrating how different technological formats can shape perceptions and experiences of social interactions.

Amina's observation presented next resonates with Jane's. As hoped, despite the exposure to 3D video despite the choppy and jumpy video, Amina felt immersed and noticed more of her surroundings. Below is a segment of Amina's field notes based on 3D and 2D videos. It begins with Amina's impressions of the 3D video of the same clip.

The woman is wearing a headscarf with yellow paisley. Walking through the street very purposefully has a destination that is not wandering. I can hear many motorbikes on a main road somewhere. The image is choppy and bumpy due to the camera being on her head and the roads unpaved. Talked and laughed with men outside the market fixing (possibly) a bike. More of a business conversation with the man in the shop not laughing just focused on getting grain/beans and other food. The woman stared directly at the camera and the woman while looking her up and down. Music on the way to market is not as pop-ish as music towards the end near the truck. The baby cried and the phone rang.

Amina then follows with her impression of 2D videos.

The color and quality varied between experiences. Fruits including pineapples, bananas, and others are sold outside the market. Woven baskets are scattered around everywhere. Shops and places of work all close together and organized parallel to the market with small connecting alleyways. A small child walking alone in the street (maybe the one who cried earlier). A woman (pink plaid) in the market rally stared at the camera. People on the street didn't care as much about the camera. Many men on motorbikes with a few women on the back. …Playstation three sign. What PlayStation are we on now? When was this taken? How outdated is the technology? Other ads seem outdated too.

Like Jane's description, Amina's observation as captured through the fieldnotes shows features of "thick descriptions." Her report is full of details including the sounds, structures, forms of interactions, and aesthetics of the street. While she doesn't fully contrast the 2D and 3D videos, she does note the color and quality varied between the two videos but we get more details about interactions, aesthetics, and structure from the 3D video. Amina notes women directly looking at the camera—this event was reported by several other students—the music on the streets and talks and laughs on the street. The videos also generated questions and curiosity about technologies such as the PlayStation. Amina also asks questions related to time, space, and pace of development.

Mathew's field notes commence with a thick description of the social life and its surroundings, which we have condensed for restriction of space. Subsequently, there is a shift towards embodying the perspective of the main actor in the video, the market woman. Mathew employs the first-person pronoun "I", indicating his adoption of the market woman's viewpoint.

The big street is full of motorbikes and regular bikes. I walk across to the market. At the front of the market, I can see a fruit stand. Bananas and mangoes. I make my way into the market. It also seems that most of the stands are closed, as plastic sheets cover what would be the table where the goods are

sold. Maybe it is too early…A woman is standing next to me. She leers at me and stares me down for quite a while. She does not look happy (in the VR, I come to realize that she is saying something to me)…I was a little more and noticed a PS3 sign on the wall. This place is a little outdated as the PS3 is an old model now.

Most of the students' reports can be described as thick descriptions; they are filled with rich details capturing interactions, structures, aesthetics, and perspectives, while also immersing the reader in generating questions and reflections on social life. However, Mathew's report exhibits a distinct shift as he begins to embody the persona of the actor. He describes himself as the actor within the social scene, offering interpretations of the events. One of the study's objectives was to empower students to immerse themselves, experience, interpret, and vividly describe the social worlds they encountered.

Mathew was not the sole student to experience embodiment; several others did as well. Here is an excerpt from Hassan's field notes: Instead of using "I" to describe his presence, Hassan opts for the pronoun "you." Similar to Mathew's approach, Hassan's field notes, like those of his peers, are replete with details, reflections, and questions.

In the marketplace, many goods are being sold, and the salesman seems laid-back as another woman watches the interaction. When you pass another, you greet them, but not always. People linger on the roads, whether they are just sitting on their scooters, or talking with others…The alleyways have not only homes but also small stores selling food or goods like PS3s. Conversation between this woman and those she interacts with is brief --> is that of the culture, or due to the camera on her head?... A small child is within sight of its mother or caretaker, and the woman makes no gesture to say hello to the baby. She does avoid it but does not give it a wide area like we would in America, where personal space is a big deal. The same goes for the woman at the marketplace - she did not give the woman a ton of room, an act which to Americans would be thought of as rude.

Culturally situated greetings, interactions, temporality, and spatial usage are among the details that pervade Hassan's field notes. Similar to his peers, Hassan positions himself as part of the interaction by using the pronoun "you" instead of the third person. Like other field notes, Hassan's observations extend beyond rich descriptions to include reflections on what he observes. He particularly focuses on the concept of social space and contemplates how it contrasts with notions of space in the US. In the clip, the social distance appears short, which might be perceived as rude in the US, whereas in the context of the clip, it signifies intimacy and care.

DISCUSSION AND CONCLUSION

From an epistemological standpoint, how does the use of immersive media add value, changes or challenge the current approach of using ethnography in class? The goal was to create three immersive informal ethnography (IIE) videos, where students would engage in small groups through immersive technologies. Following these events, we would measure if students were able to: (1) Integrate a rich immersive experience because of the way they are designed and captured into the course's conceptual framework; (2) produce "thick descriptions of the social worlds they have experienced and (3) provide some preliminary insights about the difference between 2D and 3D videos in creating an immersive experience.

For this study, an explanatory theory model was implemented in the form of IIE. A 360-degree video was created using ethnographic and foundational learning theory to enhance immersive abilities, which can lead to thick descriptions (TD). The TDs are the ability to observe, notice, and describe more about social events. Through active, kinesthetic learning, the media facilitated information processing from the learners' short to long-term memory. These immersive experiences aligned well with the learning outcomes which have been shown to produce similar TDs in other studies (Cossovich, Hargis & Chun, 2020; Hall & Hargis, 2007; Hargis, 2006; Hargis, Bowman & Alexander, 2007; LeZhou & Hargis, 2020; Minnes et al., 2017). The results of the study, despite their methodological and technological shortcomings, show that intentionally created media guided by theory can produce rich and immersive media for classroom instruction.

We argue that IIE can address several challenges faced in traditional ethnographic education, such as logistical constraints, limited immersive experiences, and the dominance of written texts over

experiential learning. Regarding the impact of immersive technologies on learning outcomes, the findings from students' field notes and surveys suggest that IIE can facilitate richer and more immersive experiences compared to traditional 2D videos or lectures. The 360-degree videos enabled students to engage in "thick descriptions" by providing multiple perspectives, capturing intricate details, and allowing them to embody the viewpoints of the subjects in the videos. Students reported feeling more present in the environment, noticing social interactions, and generating reflections and questions about the cultural context.

In terms of pedagogical theories, IIE aligns with several principles of experiential learning and constructivism. By encouraging students to adopt an ethnographer's mindset and immerse themselves in virtual environments, IIE supports the idea of situated cognition, where learning is deeply embedded in authentic contexts and social practices (Lave & Wenger, 1991). Additionally, the use of immersive technologies and the emphasis on observation, reflection, and meaning-making resonate with Kolb's (1984) experiential learning cycle, which emphasizes the integration of experience, reflection, conceptualization, and active experimentation.

IIE also challenges the traditional notion of ethnography as primarily a written text by embracing multimodal representations, such as videos, audio, and tactile sensations. This aligns with the evolving understanding of ethnography as a form of representation that can encompass various media and genres (Pandian & McLean, 2017). Furthermore, IIE supports the principles of active learning and learner-centered pedagogy by positioning students as active participants in the learning process, encouraging them to engage with the content through observation, interpretation, and reflection (Piaget, 1974).

RICH IMMERSIVE EXPERIENCE

By immersive experience, we are referring to the ability to transport the viewer into virtual environments that are difficult to access through images, videos projected on screens or head-mounted cameras. In our study, we used 360 videos projected through head-mounted cameras to create this experience. This way of experiencing virtual worlds enables the viewer especially students to observe scenes, sights, events, and actions from a variety of points of view, scales “expanding learning experiences, providing a preview or review of real field trips, and assisting in applying complex processes with the supplement of additional information and explanation” (ÇalÕúkan, 2011; Puhek et al., 2012). Excerpts from fieldnotes above suggest that students had an immersive experience using 3D video, which entailed noticing more details as compared to 2D videos and learning more of the environment through multiple sensory experiences such as video, sound, and perspectives. As Jane and other students note, the videos ``threw them” into a sensory experience of “being there.”

Immersive experiences are enabled through special technology. The most common immersive technologies are virtual reality (VR). They fall under two categories: projection of virtual worlds via desktop computers and through a head-mounted display (HMD). While in the former, the images are projected on a computer screen in the latter, it is displayed on screens in front of each eye (Buttussi & Chittaro, 2018; Tussyadiah et al., 2018). While in the desk-top-based VR, users interact via mouse and keyboards, in the HMD VR, the users interact with virtual objects using VR controllers. HMD VR offers more immersive experiences than desk-top-based systems (Cheng & Tsai, 2019). In our study, we projected the 2D on normal screens and exposed students to a mounted Oculus VR headset.

Given these possibilities in VR, we wanted to create an experience for students, where they could “feel” and move to experience rich audio-visual stimuli and manipulate the social phenomenon projected. For example, students felt and experienced being in the streets of rural Tanzanian towns, through its sounds, visuals, aesthetics, and structures. The feel produced by the 3D videos also created an embodiment, where arguably, students were not just observers but participants in the scene. Mathew’s evocative description captures this dynamic: “*A woman is standing next to me. She leers at me and stares me down for quite a while. She does not look happy.”* It reveals not only the process of experiencing the self of the actor but emotional intensity of social interactions. VR videos enable the user to embody these different points of view. An example is an American male student taking the perspective of a Tanzanian married woman from a small town in Tanzania.

The IIE approach presents a promising avenue for enhancing ethnographic education through the integration of immersive technologies. However, the findings from this study are limited to short-term observations and self-reported experiences. To fully understand the potential and implications of IIE, future research should explore its long-term impact on students' understanding and application of ethnographic concepts and methods.

Longitudinal studies could investigate how immersive experiences shape students' conceptual understanding, analytical skills, and ability to conduct ethnographic research over time. Researchers could follow a cohort of students throughout their ethnographic coursework, comparing those who engage with IIE to those who receive traditional instruction. Assessments could measure changes in students' comprehension of key ethnographic concepts, their ability to produce thick descriptions, and their proficiency in applying ethnographic methods in real-world contexts.

Additionally, future studies could employ mixed methods approaches, combining quantitative measures of learning outcomes with qualitative explorations of students' experiences and meaning-making processes. In-depth interviews, focus groups, and analysis of students' reflective journals could provide valuable insights into how immersive experiences influence their perceptions, attitudes, and ways of engaging with ethnographic knowledge.

Furthermore, future research should examine the scalability and feasibility of implementing IIE across different educational settings, considering factors such as resource availability, technological infrastructure, and institutional support. Comparative studies across institutions could identify best practices and strategies for effective implementation. Finally, as the authors acknowledge, ethical considerations surrounding representation, power dynamics, and the potential for reinforcing stereotypes or voyeurism must be carefully examined. Future research could explore pedagogical approaches and curricular designs that integrate critical discussions and reflections on these ethical issues, ensuring that immersive experiences foster responsible and culturally sensitive understandings of ethnography.

LIMITATIONS

While the findings from this study provide valuable insights into the potential of IIE for enhancing ethnographic education, it is important to acknowledge several limitations, particularly related to the technical challenges encountered during the implementation of immersive technologies. One significant limitation was the technological problems experienced by a majority of students (8 out of 10) when using VR headsets to view 360-degree videos. Students reported issues such as nausea, dizziness, and headaches, which could have hindered their ability to fully immerse themselves in the virtual environments and engage with the content effectively. These side effects may have influenced the quality of their observations, reflections, and overall learning experience.

The study relied on a single exposure to a three-minute 360-degree video, which may not have provided sufficient time for students to become accustomed to the immersive technology and overcome the initial discomfort or motion sickness. Future studies should consider incorporating multiple sessions or a gradual introduction to VR experiences, allowing students to adapt to the technology and potentially mitigate adverse effects.

The research did not account for individual differences in susceptibility to motion sickness or other factors that may have influenced students' experiences with the VR headsets. Future research could explore strategies for identifying and accommodating students who may be more prone to adverse reactions, such as providing alternative viewing options or implementing preventive measures. Technological limitations related to the quality and stability of the 360-degree videos may have also impacted the research findings. Students noted issues such as choppy or bumpy images, which could have distracted from the immersive experience or hindered their ability to observe details effectively. In the future we should prioritize the use of high-quality, stabilized 360-degree videos to minimize these technical issues.

To overcome these limitations, we could explore alternative immersive technologies that may be less susceptible to adverse effects. For example, the use of augmented reality (AR) or mixed reality (MR) technologies, which blend virtual elements with the physical environment, could provide a more

comfortable and seamless immersive experience for students. Partnerships with technology companies or research institutions specializing in immersive technologies could facilitate access to cutting-edge hardware and software solutions, as well as expert guidance on best practices for implementation and user experience optimization.

Conducting pilot studies or usability tests with various immersive technologies could also help identify potential technical challenges and inform the selection of appropriate tools and strategies for effective implementation in educational settings. By addressing these technical limitations and exploring innovative solutions, future research can provide a more comprehensive and accurate assessment of the potential benefits and challenges of incorporating immersive technologies in ethnographic education.

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