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'Gives a physical sense almost': Using immersive media to build decolonial moments in higher education for radical citizenship

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PLEASE SCROLL DOWN FOR ARTICLE

'GIVES A PHYSICAL SENSE ALMOST': USING IMMERSIVE MEDIA TO BUILD DECOLONIAL MOMENTS IN HIGHER EDUCATION FOR RADICAL CITIZENSHIP

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Abstract: *In the context of higher education, immersive media may provide a way to deepen students' learning experiences and facilitate a sense of 'being there'. Immersive media can also possibly contribute to decolonization if it involves Indigenous-produced content and generates increased appreciation of Indigenous knowledges that leads to student commitment to undermine colonial power. In doing so, radical digital citizenship can be extended. This article examines how immersive media can help educators develop appropriate learning experiences that support radical digital citizenship, a way of engaging with the digital that is defined as critiquing digital technologies which are oppressive and then developing emancipatory technologies to provide alternatives (Emejulu and McGregor 2019). Theoretically and practically, the arguments herein are inspired by Tuhiwai Smith's imperative that decolonization in higher education must not be an empty promise but work to transform institutions, teachers and students. The convenience of using immersive media for learning is frequently emphasized in higher education, but the challenges of ensuring students can use immersive media are not often acknowledged, and the immersive media and pedagogy literature is just beginning to deeply engage with issues relating to decolonization. Drawing on an empirical study of the use of immersive media in a co-taught third year and Masters course, this article uses observations from in-class use of immersive media and a survey of students who actively engaged with, and thought about, the technology (n=71). Immersive media usage can extend the notion of radical digital citizenship by using existing technologies to help students understand and then challenge settler colonial relations and practices in their work and daily life.*

Introduction

In the context of higher education, immersive media may provide a way to deepen students' learning experiences and facilitate a 'physical sense almost', as one student reflected during this study. Immersive media can also possibly contribute to decolonization of learning experiences by facilitating delivery of Indigenous-produced and -centred content, and increased appreciation of Indigenous knowledges. Inviting students to then act on this greater knowledge and appreciation of Indigenous perspectives is one way to facilitate meaningful decolonization rather than superficial awareness building. There are multiple benefits of generating affectual moments in learning and teaching activities, especially when considering questions of settler colonial power and resource management. From helping non-Indigenous students understand the lived experiences of Indigenous peoples to revealing the hidden power relations in scientific approaches to resource management, there are good justifications for using new pedagogical tools to support the attainment of empathy for particular groups (Brown et al 2020), especially as social and environmental injustices persist in settler colonial nations.

These learning processes about settler colonial practices can support development of radical digital citizenship, an idea developed by Emejulu (2014) as an approach for building better digital and social

spaces that prioritize social justice. Emejulu (2014) argues that critiquing digital technologies and developing emancipatory technologies are two key elements that allow for radical digital citizenship. This iteration of digital citizenship is 'a process by which individuals and groups critically analyse the social, political and economic consequences of technologies in everyday life and collectively deliberate and take action to build alternative and emancipatory technologies and technological practices' (Emejulu 2014, no page numbers). Emejulu and McGregor (2019) argue that the materialities of digital technologies provide a way in to talk about how these tools refigure and remake older contestations about social justice. A radical digital citizenship is achievable, Emejulu and McGregor argue, and desirable, if we are invested in building new human-technology relations. In a practical sense, radical digital citizenship may be demonstrated by learning code to create digital presences and/or hacking existing systems to improve them.

Creating alternative and emancipatory technologies is a material way to support radical digital citizenship. However, Emejulu's proposition for emancipatory technologies could be extended by drawing on more strategic and pragmatic use of digital technologies, rather than technical interventions. Influenced by research demonstrating how people, communities and organizations have been using technologies that are not inherently emancipatory, this research extends Emejulu's notion of radical digital citizenship to include strategic use of digital technologies that are already in existence and can be redeployed to undermine colonial power. The strategic use of flawed digital technologies is pursued by diverse individuals, groups, and organizations to build solidarity and nurture constructive ways of being. Previous research has shown how Aboriginal and Torres Strait Islander people are using digital technologies such as social media for activism and maintaining kinship connections (Carlson and Frazer 2018) and virtual reality to share experiences of being on Country (Anderson 2018). Feminist groups use social media to build solidarity and campaign against sexism and misogyny (Gleeson 2016). People with disabilities use digital technologies to assert crip identities and centre the work of disabled people as knowers and makers of digital spaces (Hamraie & Fritsch 2019). Inspired by these strategic interventions, this research uses existing technologies in the form of immersive media to create the conditions to facilitate radical digital citizenship in a higher education classroom.

I am using the term 'immersive media' in this article as it has emerged as an acceptable label for a broad range of immersive experiences including virtual reality documentaries and 360 degree gaming (Scott-Stevenson 2020). Immersive media involves viewers shifting from passive watching to active participation in the media they are experiencing (Rose 2018). The immersive aspect of the experiences that form the focus of this research relate to how students became active participants in the scenes they became a part of – whether in a room conversing with Indigenous people or in Martu Country with Indigenous people.

This article starts with a background to the unit and the research, describes the methodology and the findings of the research, before discussing the implications of this research for immersive media, decolonizing higher education and radical digital citizenship. Broader arguments about the feasibility of decolonizing digital technologies as a practice and goal are beyond the scope of this article. As a white person in a settler colonial state, I acknowledge my privilege and the limitations inherent in any attempt to undermine colonial hegemony (Langton and Bowers, 1993).

Background to the unit and the research

The immersive media components that are the focus of this study were added to a course called 'Rethinking Resource Management' that is over twenty years old and has been transformed at different times to address changing student cohort characteristics, by new teachers involved in the unit, and in response to social and political contexts. In 2016-2017, the course was redesigned to include blended learning components to adjust the teaching and learning patterns of students and teachers to increase student engagement and to respond to different social, political, cultural and environmental conditions. This transformation was successful in terms of getting more students actively committed to their learning (Graham et al 2017). The first learning outcome of the course focused on helping students gain knowledge of contemporary resource management issues, including the complexity of these issues, and the impacts of ongoing settler colonialism (de Leeuw et al 2013; McLean et al 2019). This course explicitly centred Indigenous perspectives on how land and waters are managed and challenged colonial hegemonic practices, offering case studies of the exercise of power and its resistance from around the world.

In 2019, I offered digital culture components at key moments in the semester and invited and prompted students to think critically about these learning opportunities before, during and after they occurred. The students that undertook this unit in 2019[1] were diverse in terms of their study areas: students were doing Bachelor studies with majors in Environment, Planning, Education and Arts, and Masters of Environment, Planning and Sustainable Development. Further, there were students from Nigeria, Russia, India, Nepal, Hong Kong, China, Japan, United States of America, England and Australia. This diversity was a real strength of the cohort as the students brought their subjectivities and insights to bear on issues arising from analysis of power relations in resource management. By offering immersive media experiences in this unit and examining how they were received, this study aimed to help students to either see reflections of themselves if they are Indigenous and/or develop and extend empathy to Indigenous peoples with respect to marginalization from resource management practices. The qualifications on the scope of this project are important as decolonization can only happen in institutions if each and every agent is invested in such a process. The transformation of universities may include different interventions at certain scales, and this research aims to contribute to a broader and important goal of decolonizing the university. The immersive media used in this unit aimed at providing an opportunity to 'unsettle geographical knowledges in the classroom' (Daigle and Sundberg 2017) by allowing students to experience transformative moments in the way teaching and learning has traditionally been conducted.

Returning to the idea of radical digital citizenship and how it can be encouraged through higher education, I share Emejulu's claim that radical digital citizenship is a worthy and important goal when trying to transform the digital. Offering decolonial moments with immersive media in higher education can aid that end. But while it may be empowering to help people remake the digital and build technical proficiency and literacy of the digital, it may not always be necessary to construct technical learning opportunities in order to achieve degrees of emancipation. In other words, digital education in technical contexts does indeed afford pathways for individuals and groups to move beyond commodification and performances of 'digital selves' but so can offering digital moments in

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[1] I have taught this unit for 7 years and this study was conducted during the last year of its offering.

scaffolded, critical thinking learning environments. Decolonization as a concept may receive different and deeper consideration when delivered in immersive media moments, due to the experiential intensity of using immersive media as it facilitates distinct emotional responses and potentially generates sharper memories.

Decolonization in higher education must not be an empty promise but work to transform institutions, teachers and students (Tuhiwai Smith 2010). Within the context of the digital humanities, Risam (2018, 79) proposes that the 'affordances of digital technologies...help make decolonization legible and reveal its limits.' I agree that this is a definite strength of using a broad range of digital technologies in the higher education classroom; students sometimes struggle to unpack colonial practices as they can be presented as the norm in settler colonial states, outside of – and sometimes within – the higher education classroom. Therefore, using devices and offering experiences that work in novel ways to draw out key aspects of colonial power is a viable option when attempting to highlight settler colonial power that is often hidden or normalized. The experimental use of immersive media in this class aimed at teaching students to resist settler moves to innocence, in the sense that Tuck and Yang (2012) describe, and to acknowledge their roles in, or experiences of, colonization.

As Noxolo (2017) observes, decolonization requires the ceding of territory and materially transforming institutions and Indigenous people's lives. Decolonization must work towards material reparations rather than simply awareness building of settler colonial histories and presences. Reparations are needed for injustices and violence that accompany colonization, including but not limited to, labour abuses, and land and water appropriation. But decolonization does not stop at reparations, it must also include abolishment and/or refiguration of institutions that perpetuate settler colonial thinking.

Within the digital humanities, Risam (2018) argues that settler colonial violence appears discursively. Specifically, the remaking of colonial knowledge and Eurocentric presentation of knowledges are two ways in which settler colonial violence appears in digital humanities. This resonates with how digital technologies more generally, beyond the digital humanities, tend to focus on the Global North and produce asymmetrical representations of ways of being and knowing (Graham et al, 2017; McLean 2020). Beginning to think about even contributing materially to decolonization, then, when using immersive media, is challenging in the context of higher education.

Methodology

The research for this article involved two methods: an invitation to students to complete a survey on their experiences with the immersive media and its relationship to decolonization (approved by the Macquarie University Human Research Ethics Committee), and reflections on and observations by the author on the new learning and teaching activities. The student cohort was a mixture of one hundred and ten external and internal students. Most students were enrolled internally and all external students (twenty) undertook the learning activities as digital lessons. Feedback was given on a weekly basis to external students to help them engage with the course materials regularly and in a guided way. Fifteen internal Masters students completed the survey, one Masters external student, forty-nine internal third years, and four external third years. The surveys were completed anonymously and without implications for the students' performance in the unit.

Mixed methods underpin this article as quantitative data was generated from the survey and qualitative data from the survey and observations. The qualitative survey data and notes from observing the class were analysed using affective (emotion and values coding) and elemental (process and descriptive) coding methods (Saldaña, 2013). Second cycle coding allowed for these basic, category codes to be explored in greater detail and in relationship to each other, through identifying potential analytical codes (Cope, 2010). Before students were introduced to the immersive media, as a class we discussed our connections to place and what forms of colonial power we had experienced and/or were aware of through lived experience. Lecture material gave outlines of research by Indigenous and non-Indigenous scholars on how to reframe resource management to peel back settler colonial power (including Bawaka Country et al, 2003; Howitt 2001), and students were set readings and asked to think deeply about decolonization before writing and reflecting on these texts. Students were also invited to think reflexively about the ways that scientific research and resource management can sometimes extend colonial power and how recognition, and inclusion of, Indigenous ways of being works as one way of unsettling this power (McGregor 2014).

Two forms of immersive headsets were used over the course of the semester: a headset that used a mobile phone to deliver the videos (VR-X Headset) and a headset that had software installed in it for pre-loaded viewing (Oculus Go). The former offered a 100 degree field of view that enabled 3D effects while the Oculus Go headsets offered higher quality optics and were more comfortable to wear. Both enabled students to watch the assigned videos but it is important to note that VR-X headsets cost one tenth the price of the Oculus Go headsets. The two different headsets were used as the Oculus Go were not available for use from the beginning of semester and a stop-gap measure was required to achieve the desired learning outcomes.

Three videos were included in the curriculum:

1. *First Contact* produced by SBS Australia – a 5 minute video that immerses the viewer in a conversation with 8 Indigenous Australian leaders
2. *Collisions* – a virtual reality film directed by Lynette Wallworth and 'with' Nyarri Morgan.
3. *Thalu: Dreamtime is now* - directed by award-winning Ngarluma man Tyson Mowarin with art by Sutu (Valve Corporation 2019).

First Contact was scheduled during the first week of semester, *Collisions* in week four and *Thalu* was offered from week 7 as it became available for students through a library subscription. *First Contact* was produced to accompany a series of the same name on SBS, an Australian hybrid public/private media company, that was aired in 2016. Directed by Blackfellas Film's[2] Darren Dale, *First Contact* is 5 minutes long and includes perspectives from the following Indigenous leaders: 'Aunty Millie Ingram - retired CEO and activist; Nakkiah Lui - writer/actor; Jenny Munro – activist Mi-kaisha Masella - singer/songwriter; Bruce Pascoe – writer; Shane Phillips - Aboriginal rights advocate; Wesley Enoch - playwright and artistic director; James Saunders - PR agency head' (SBS Guide 2016). The viewer participates in a yarn with the speakers in a digital room that they enter by moving their head around and shifting their gaze direction. The film is prefaced in the following way:

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[2] A media production founded by Indigenous film maker Rachel Perkins.

> 6 out of 10 Australians say they've had little or no contact with Aboriginal people. But through the extraordinary world of VR, they can now have their 'First Contact'. (SBS Guide 2016)

Collisions is a film that tells the story of Nyarri Morgan, a survivor of the Maralinga nuclear testing in South Australia during the 1950s, while also taking the viewer to Martu, Nyarri's Country in Western Australia. The website for Collisions describes the film in the following way:

> '*Collisions* is a virtual reality journey to the land of indigenous elder Nyarri Morgan and the Martu tribe in the remote Western Australian desert. Nyarri's first contact with Western culture came in the 1950's (sic) via a dramatic collision between his traditional world view and the cutting edge of Western science and technology.' (Collisions website)

The film reimagines the Maralinga testing with an animation of an explosion and kangaroos falling to the ground, while Nyarri narrates his experience of the apocalyptic event, which was originally read as a sort of gift. *Collisions* continues the story of the ongoing impact of resource extraction and different ways of being in rural Australia as it takes the viewer to Nyarri's home in Martu and shows him painting an artwork that represents his experience of the nuclear testing. The film was nominated for an Emmy award.

The third film, *Thalu*, was made available through the university library only halfway through the semester so it was not able to be scheduled as a compulsory learning activity during class time or for externals. Only one student reported watching Thalu in the survey. As an Indigenous-produced immersive media game, it is an important contribution to the decolonization efforts that these interventions might offer, but due to circumstances it was not core to the offering.

While Rose (2018) defines immersion as a lone viewer moving from passive recipient of a story or world to an active creator, in the context of a higher education classroom where multiple headsets are being used simultaneously, there is another dimension at play in the immersion for this study. For each immersive media experience, the class had conversations before and afterwards, tying the themes of the unit together with those brought to the fore in the videos and discussing to what degree the immersions were transformative or otherwise. The students watched each film in small groups as we did not have enough headsets for simultaneous viewing. Following their experiences, students were able to share their experiences with peers, and then contribute to a whole class discussion that was prompted by questions about how they felt watching the films, what they learnt from watching them and what was surprising or familiar about the experiences. External students also talked in digital discussion forums about what they had experienced and were prompted by the same questions as internal students.

Research findings

As previously mentioned, empirical material for this article includes student reflections on their experiences in a non-compulsory survey at the end of the semester, as well as drawing on observations of how the cohorts engaged with the immersive media and how I experienced facilitating the experiences.

In response to the question 'Reflecting on the VR that was used in this unit, what did you like about the experience?' students chose the following:
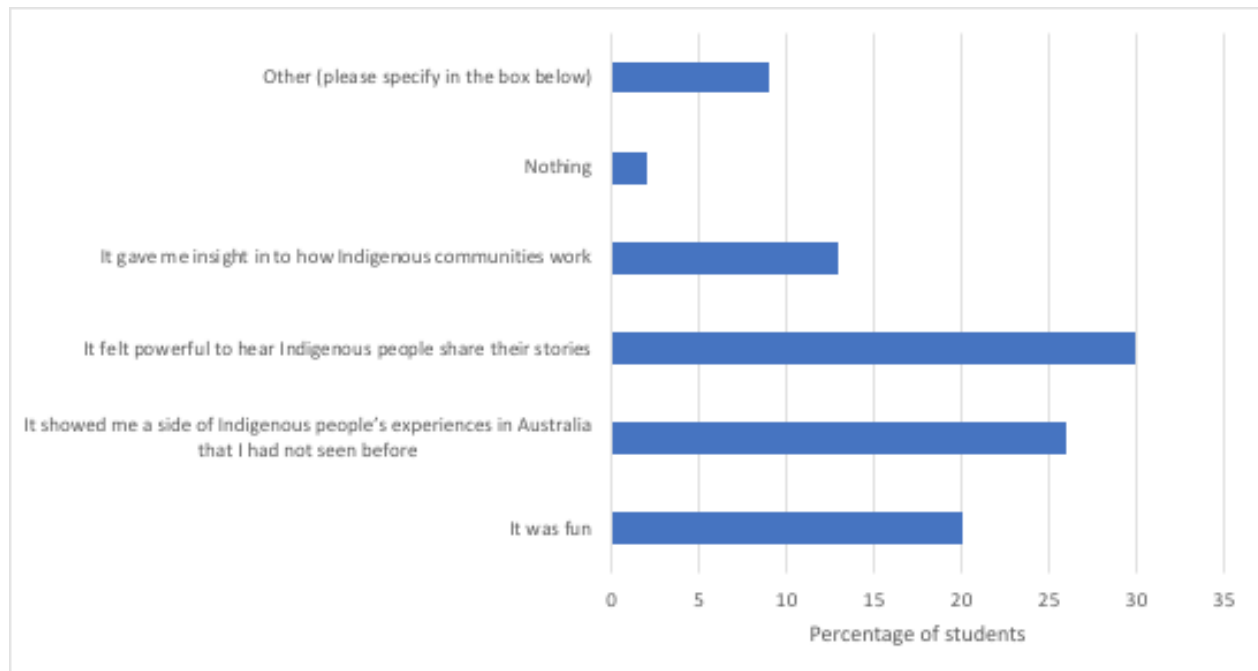

Figure 1: What students liked about the use of VR in the unit (number of students – students were able to choose more than one option)

From this data it is clear that most students found the immersive media compelling, powerful and enlightening about Indigenous knowledges and experiences relating to resource management. If students chose 'other' they were invited to share in words what appealed to them about the immersive media. One student said that 'It was a unique way to learn and was more hands on or like independent' and another shared that 'It was really interesting, it showed me a side of Indigenous peoples experiences in Australia and understand their stories and how their communities work'. The use of different technology was welcome and a repeated theme in responses:

- Gives a physical sense almost. Visually provided a greater experience and connection and understanding to the discussion.
- It was useful as it provides a greater interaction and understanding with content as opposed to a reading or workshop.
- Different medium for learning
- I felt that the use of VR gave the storytelling an additional level of impact as the immersiveness of content delivery meant I felt a greater connection to the material
- It was good to do something different in the classroom, which ends up making people more engaged

Students had been considering what decolonization means in the context of resource management in multiple colonial contexts throughout the semester and were prepared to discuss how decolonization

could be achieved in the classroom in and of itself. When posed the question of how higher education classes could contribute to decolonization, students offered rich and reflective answers:

- consider different sources of knowledge as truth outside of western science. Perhaps do a whole section of course as would be taught and communicated by indigenous australians [sic]
- I think the use of VR is a really good way through which to allow different spokespersons to offer opinion without being dependent upon physical presence of individuals
- Increasing the number and frequency of Aboriginal and Indigenous voices on all topics, too many are from a solely Western perspective
- WITH THIS!

One student shared that they were not sure about how to best achieve decolonization in the higher education classroom: 'That is a tough question to answer. Not overly sure how to go about this'. This reflective response indicates the depth of understanding that the student had about decolonization – it was a key idea that we discussed at multiple points during the semester – and the challenges inherent to the dilemmas that come with seeking to peel back settler colonial power.

The closing survey comments from students reveal some of the generative aspects of immersive media as well as some less constructive qualities of them. The embodied challenges of using immersive media were pointed out by one student who said that 'VR is effective, however, it is physically taxing for me as I am easily nauseous'. I also observed many students struggling with the request to remove make-up and change their hairstyles to accommodate the headsets at the beginning of classes with the immersive media. While these may seem like superficial issues, for a student to willingly and enthusiastically participate in new technological experiences, removing significant hurdles for that participation is a priority.

The measured application of immersive media was highlighted by several students – one said that 'more units should use it, but overuse would lose its effectiveness' and another said 'VR has varied success depending on individuals and I would carefully consider the group I used it with to determine whether it would be appropriate if I were to conduct an exercise with it.' These observations suggest that ubiquitous application of immersive media may stymy its efficacy; considered and targeted placement of lessons with immersive media was put forward as apt, rather than frequent usage.

One of the ultimate goals of the unit was to get students to think creatively about how to engage with resource management to centre Indigenous knowledges. When asked if VR has helped them to imagine how they might do resource management differently to include Indigenous perspectives, 61% of students said yes, 17% said no and the remainder were undecided. While I would have preferred all students to respond affirmatively to this question, this is nevertheless a welcome finding from an experimental offering of immersive media; the research data shows that students have worked to recognize their roles and relationships with respect to colonial power and how they are intending to subvert colonial hegemonies.

Some drawbacks and limitations to using immersive media as a way to facilitate decolonization included embodied aspects of digital use and individual preferences about new technologies. As noted, some students in the class found the use of headsets uncomfortable due to nausea/dizziness responses and many did not welcome technological use requirements such as removal of makeup and changing

hairstyles to accommodate headsets. Students also simply preferred not to use digital technologies without explanation and were disinclined to engage with these technologies. Also worth mentioning is that the practicalities of teaching large numbers of students with technologies that are expensive and in limited supply affected the efficacy of learning and teaching activities that rely on immersive media.

As a teacher introducing new learning and teaching activities with novel technologies, I struggled with aspects of the embodied qualities of delivering immersive experiences. The Oculus Go headsets that were used during the second viewing opportunity were housed in a hardcase that weighed about twenty-two kilograms. When I expressed surprise at the size of the container and that I may have difficulties moving it between classrooms and up/down stairwells, the manager of the headsets appraised my physicality and suggested that I looked like I would be able to cope. The bulk of the case was reasonable, as Figure 2 shows, and while it had wheels for rolling it between learning sites, several classrooms did not have full accessibility and my office also did not. Fortunately, I had enthusiastic students who were able to help me carry the case back to my office after class to ameliorate some of these embodied challenges.

Figure 2: Oculus Go in their hard case (sneaker included in top right corner for scale).

Discussion: Implications for immersive media, decolonizing higher education and radical digital citizenship

I do not claim that the use of immersive media in this form of higher education teaching leads to a strong form of decolonization. It also does not replace instruction by Indigenous people who are properly recognized and remunerated for their work. Appropriately supporting Indigenous scholars to work within higher education, rather than exploiting expertise and knowledges, still has a long way to go (as articulated by Indigenous scholars including Thunig and Jones 2020; Trudgett et al 2016). Thunig and Jones (2020, no page numbers) describe how Indigenous academic women, in particular, are mistreated and 'experience intersectional, racialized and gendered disadvantage within the academy'. Further, Michelle Bishop (2020), a Gamilaroi woman from western New South Wales, argues that Indigenous students are often framed as deficient in settler colonial contexts, despite long histories of successful education systems prior to colonization. Bishop states that Indigenous education sovereignty which is grounded in Aboriginal ontologies and epistemologies is crucial for transforming education, raising the question of how this would work at all levels of education, from early childhood to higher education.

If using ethical and appropriate digital technologies, it could be claimed that the more tools that are available to transform higher education to centre Aboriginal ontologies and epistemologies, the greater the likelihood that this could be realized. But the question of what constitutes ethical production of immersive media, for example, could easily become vexed if colonial extractivist modes of research and art production are carried over from older technologies into these new modes.

Sharing Indigenous produced immersive media is possible thanks to the already mentioned works, and several other excellent resources available through various creators and platforms. For example, Brett Leavy describes himself as 'First Nations, Digital Aboriginal' and is lead of Virtual Songlines (https://www.virtualsonglines.org/projects), an organization that produces serious digital games and immersive experiences for pedagogical purposes and public exhibition about First Nations knowledges. I offered one 2D video of Leavy's work as a teaching component in the unit too but due to budgetary issues the full immersive media experience from Virtual Songlines was not available for this offering. This discussion considers the strengths of using immersive media to scaffold decolonial moments in higher education before evaluating the weaknesses of this approach.

Strengths of using immersive media to build decolonial moments in higher education

Students who watched the films in this unit were often visibly unsettled by the experiences, especially *Collisions.* The atmosphere in the classes during and after the films was respectful and intense; the affect generated by the films was different to that during the previous seven offerings of the unit. External students who watched the films remotely also reported being moved by their viewings. Students took the imperatives put forward in these immersive experiences seriously and, as the survey data shows, intend to do resource management in ways that centre – rather than marginalize – Indigenous knowledges. Undoing colonial power involves commitments to changing everyday practices and with 61% of students reporting that they were better able to imagine ways of doing resource management in decolonial ways, it is evident that in this instance, immersive media was a

constructive technology. Tuck and Yang's (2012) call that settler moves to innocence must be avoided at all cost in decolonization efforts comes to mind here as students grew awareness about their positioning in relation to colonial power and were invited to work to change these relations.

This case study corroborates the literature that captures the benefits of pedagogical applications of immersive media in higher education, including research that shows how students tend to learn more effectively when using these technologies. For example, Hew and Cheung (2009) provide an exhaustive review of immersive worlds in education from primary school to higher education and find that researchers and teachers have used these technologies to support learning about worlds that may not be otherwise possible. The process of experiencing field trips with immersive media was highly valued by students and teachers alike, especially as they were considered as supplementary and superior to text-oriented digital displays or one-dimensional material.

Immersive experiences can present Indigenous ways of knowing and being that may help challenge colonial power as Indigenous knowledges are centred rather than placed on the periphery. Decolonization, for Maori scholar Linda Tuhiwai Smith refers to 'a long-term process involving the bureaucratic, cultural, linguistic and psychological divesting of colonial power' (Tuhiwai Smith 2010, 33). Thuiwai Smith is pointing here to the scope and depth of engagement required for effective decolonization to proceed. As Fanon (1963, 36) states, decolonization is a 'program of complete disorder' that is necessary for justice and must involve recognition of historical contexts – decolonization must involve learning how settler colonial states came to be, and how they can be transformed. In that sense, decolonization is deeply geographic as the seizing of territory is key to establishing colonial power, while ceding territory accompanies that reversal. Given these imperatives, it is worthwhile noting that decolonization can be an empty promise rather than a transformative process (Risam 2018) if meaningful and substantive interventions are not core goals in digital humanities.

Keeping these principles in mind, this research shows that there are powerful learning opportunities about decolonization afforded by using immersive media, especially as it can help us imagine preferred future worlds (Scott-Stevenson 2019). As Lynette Wallworth, maker of *Collisions* claims:

> 'The thing about VR that is so powerful is that it leaves a different memory from conventional film, It feels closer to something that has happened to us, and it registers in the same part of the brain as dreams. It has a very powerful pathway to the subconscious.' (Baum [interviewing Wallworth], 2020, page 9)

Key here is how Wallworth sees immersive media facilitating experiences 'closer to something that has happened to us'; the qualitatively different experiences immersive media offer, that are deeply embodied and almost as if we have lived them in person, may provide generative moments of transformation, including with respect to colonial knowledges. Within higher education, as constraints on doing fieldwork and taking fieldtrips increase with covid-19 pandemic conditions and, before that, insurance limitations, opportunities to provide students with lived experience of lifeworlds beyond the location of universities or their homes are reducing. The findings of this research show that students were enthralled by *Collisions* and greatly appreciated the multiple Indigenous perspectives shared in *First Contact*. The depth of the experiences resonates with what Wallworth intended and it was exciting to see such reflections in students' work and survey responses.

This case study speaks to emerging research on the benefits that come with attempting decolonization in educational contexts with digital technologies – aligning with a range of disciplines that are using this approach. For example, in a powerful piece on decolonization in museums via digital technologies, Anderson (2018) shares her insights as a Wergaia woman from western Victoria who feels the power of colonial institutions but is open to experiencing transformation of those via immersive media. The Australian Museum in Canberra is one institution Anderson (2018, 59) critiques for perpetuating settler colonial practices, observing that alternatives exist: 'Digital environments are places where Indigenous people can re-imagine and re-present themselves outside of colonial history.' Anderson details the numerous ways that Indigenous people from around Australia are using immersive media to show relations to Country in digital experiences, including Mikaela Jade's Indigital augmented reality app that uses geolocation for on-Country storytelling, and Wingaru, an Aboriginal education blog.

A key reason for using immersive media as avenues for diverse storytelling approaches in this study is that this is particularly suited to Aboriginal and Torres Strait Islander storytelling, as it embraces non-linearity and timelines that have spatial components. *Collisions* moves between Countries and places and times as Nyarri's story unfolds, while *First Contact* is oriented in a yarning circle mode (Fredericks et al 2011). Similarly, Project Birronggai is an example of virtual reality storytelling by Indigenous artists and tech works that offers participants a range of Dreamtime narratives that move in time and space. It was produced by Frenetic Studios, led by Joel Davison, a Gadigal and Dunghutti man, Keenan Parker, a Bundjalung and Torres Strait Islander and Jeremy Worra a Ngarabal man. In an interview about their work, the power of virtual reality to tell stories in non-linear ways is highlighted, showing the compatibility that immersive media has with Indigenous storytelling practices:

> 'Birronggai', in my language, means, in a basic translation to English, belonging to the stars. So the project of the stars, or project belonging to the stars. And the virtual space is essentially a story told through a semi-randomized collection of small scenes that the player participates in. And each of these scenes will expose the player to an element of the Dreamtime, or living in pre-colonial Australia. Each will be accompanied by narration that will impart either some knowledge of the Dreamtime stories that we've grown up with, or our history, or our languages. (Davison et al 2018, 112)

Indigenous ways of knowing in Australia can be shared in appropriate ways thanks to immersive media that includes flexibility and circularity as core characteristics. Research on how immersive media is being used in museums today confirms how the digital facilitates engagement with non-linear narratives that helps deliver multiple starting points for certain stories (Muñoz and Martí, 2020).

Immersive media needs to be one of many ways to build strong engagement with students. Students who participated in this study appreciated the diversity of learning activities and advised against immersive media overuse. Other students in the class who were not so enthusiastic about participating in role plays or deconstructing mapping practices of Indigenous and non-Indigenous peoples seemed to enjoy the opportunity to learn through immersive media, which echoes research on the reception of blended learning methods that also draw on application of experimental digital technologies. Geographers have been using blended learning approaches to enhance student learning in many ways and recently Morris et al (2019) found that blogging was a powerful way to engage students, support

their acquisition of transferable skills and preparing themselves for professional workplaces. Similarly, Graham et al (2017) concluded that blended learning was a good way to improve student engagement and support quality reflection.

Research on decolonizing learning in higher education settings has drawn on immersive media, but not in the same sense that I am applying the term here. Howard-Wagner et al (2012) described a sociology unit that was redesigned to allow immersive learning supported with software supporting a social constructivist approach to learning rather than virtual reality films. The activities Howard-Wagner et al (2012) offered included role plays and aimed to build empathy by scaffolding learning around Aboriginal kinship systems. In another discipline, Cook (2020) analyses how decolonization in archaeology may be advanced by the use of immersive media, arguing that digital media and platforms are extending and remaking decolonization in public museums, building relationships between Indigenous people, museums and settler colonial communities. When evaluating the strengths and weaknesses of the Canadian collaborations Cook (2020) summarizes, they assert that digital technologies do afford new paths to take responsibility for past traumas to precipitate restructuring of societies.

Constraints of using immersive media to build decolonial moments in higher education

Research on immersive media in education has demonstrated how learning activities that are built around this technology are constructive, memorable and compelling but that these learning opportunities also carry substantial costs. The push for using digital technologies to facilitate critical reflection and transformative moments is broadening, as is evaluation of digital technologies in the classroom. As Sujon (2019) argues, a critical gaze on digital technologies reveals the traps that come with unconscious adoption of particular software and hardware that ushers in a form of platform colonialism. Rather than considering what digital technologies are used, or how, the education system's enthusiastic uptake of Google Classroom, for instance, has facilitated widespread acceptance of this environment that comes with particular pitfalls. Sujon (2019, 10) shares the results of her research on using Google Expeditions (GE), a VR tool that is designed for classroom use, and observes that '65% of survey respondents said they experienced a "wow-moment" during their experience, which respondents described as the moment when they saw the "phenomenal mountains" or "seeing the Syrian refugee camp as if I was a part of it".' The sense of 'being there' was also widely noted by participants, indicating that the immersive aspects of GE were effective and generated strong responses.

Simultaneously, the use of GE in classrooms deepens the reach of ubiquitous technologies for children and may lead to reliance on certain learning technologies and techniques without a critical lens. The way Google infiltrates classrooms and has become a 'necessary' educational tool has unintended consequences such as creating 'path dependency' (Sujon 2019, 2) and may be hooking young brains into a lifetime of brand familiarity and reliance. Such practices are read by Sujon as platform colonialism that entrench unequal power relations and limit more balanced perspectives on digital technologies. Software such as GE can perpetuate the problems that corporate platforms more generally tend to propagate, including dominance of digital technologies and extraction of data for unintended purposes (Barns 2019).

In this context, the question of decolonizing digital technologies is inherently fraught. Research has shown that Indigenous people are increasingly using digital tools such as social media for activism and identity expression (Carlson 2013; Carlson and Frazer 2018; McLean 2020), using troublesome tools for constructive ends. Some of the problematic aspects of trying to decolonize the digital emerge as the immersive experiences frequently available are delivered by corporations aiming to generate a profit from personal stories and are under-regulated. Oculus, the company that produces the headsets that were used during one part of this learning activity, was bought by Facebook in 2014 (Welch 2014). Given this ownership, we should take seriously the critiques of Facebook unethically extracting data from its platform without informed consent by participants (Flick 2016), as too its failures to control hate speech and manage the harm its platform facilitates upon individuals (Veer 2019).

Contextual factors, such as the physical dimensions of using technologies, are important when determining what sort of immersive media are likely to facilitate quality learning experiences. The embodied qualities of using digital technologies play an important role in the uptake of this form of instruction. The use of headsets afforded students to travel to places and experience stories in a more intense way than simple use of videos on other devices. But they also came with drawbacks including nausea and dizziness for some, the discomfort of having to adjust hairstyles and the imposition of removing makeup. While these may seem like superficial impositions, they are notable and serious impediments to many students, and if minimal friction is the goal in using new pedagogical tools, embodied aspects of using immersive media should be considered.

Being physically ill while watching something that is aimed at illuminating Indigenous knowledges and critique settler colonial practices is clearly an impediment to achieving that intended learning outcome. Yildrim (2019) notes that even the most advanced headsets still induce nausea and dizziness for some users, especially compared to desktop viewing of the same stimuli. Providing the option for students to watch the films without headsets was possible for both *Collisions* and *First Contact* and some students did take this option. In general, not all students experience immersive media as a welcome viewing opportunity, asides from the tricky physical experiences that may arise with using the devices. From my observations of how the learning occurred, pre-set orientations towards or against digital gaming, for instance, framed how students perceived learning with immersive media.

Therefore, while decolonial moments delivered with immersive media can offer a new way of experiencing places and ways of being within a standard classroom, this case study and other research shows that the use of these learning tools must be careful and measured (Bennett and Corrin 2018). Future use of immersive media by educators should 'make effective use of technology in teaching and learning while acknowledging and addressing issues around students' diversity in technology use and ability.' (Bennett and Corrin 2018, 2516).

With these cautions in mind, the fact that higher education has become increasingly service- and financially-oriented over the last few decades requires consideration. Burns (2020) outlines how the covid-19 pandemic has accelerated and intensified these changes and warns of a deepening of neoliberalization of universities. The tightening of already austere teaching conditions and the increased competition between universities that have had to respond to reduced number of international students are two components of this neoliberal intensification. Alongside this, McLean

et al (2018) state that neoliberal trajectories in universities can reproduce settler colonial practices if not enough attention is given to ethical refiguration of teaching practices.

Conclusions

The learning opportunities that immersive media afford are valuable in helping students consider decolonization in the classroom and in the context of resource management, a key concern in settler colonial states for Indigenous peoples who have been marginalized from control over decision-making and access to multiple resources. This modest research project shows that there are good reasons to use immersive media in higher education, including generating powerful emotional-affectual responses and allowing greater insight to stories and people that could be distant to the university classroom, thereby helping students engage with desired learning experiences who may otherwise not be attracted to the subject matter.

The embodied experiences afforded by digital technologies play a role in the efficacy of immersive media in terms of helping students develop deeper insights about Indigenous ontologies and epistemologies. Many students were moved by the immersive media experiences and voiced the value in learning in the way that they did; some students struggled with the physicality that accompanied immersive media moments in the unit but also saw the value in diversifying approaches to decolonization in the classroom and, more broadly, towards resource management.

Determining whether decolonization efforts achieve transformative effects, in the sense that Tuhiwai Smith and Tuck and Yang advocate, is a complicated process so what is shared in this article must be evaluated with this in mind. The experiential intensity of *Collisions* and *First Contact* videos in this human geography unit resonates with research done in other disciplines such as archaeology and museum studies. I do not claim that the use of immersive media in this form of higher education teaching could ever necessarily lead to a strong form of decolonization. It also does not replace instruction by Indigenous people who are properly recognized and remunerated for their work. Appropriately supporting Indigenous scholars to work within higher education, rather than being exploited by neoliberal systems, is a pressing project for higher education in settler colonial states such as Australia (Thunig and Jones 2020; Trudgett et al 2016).

This research reinforces the value of providing learning opportunities to promote radical digital citizenship and extended the means to facilitate this end. While building emancipatory technologies is definitely a constructive avenue for attaining radical digital citizenship, it is not the only way that people can think about and demonstrate critical engagement with digital technologies. Pragmatic and strategic use of immersive media in this higher education setting shows that decolonial moments can be enabled through scaffolded use of powerful films.

The literature and this research shows that decolonizing the classroom is an important issue in contemporary higher education (see research by Indigenous scholars Bodkin-Andrews and Carlson, 2013; Knight 2018) especially for settler colonial nations including Australia, South Africa, the United States, and Canada. By offering learning and teaching activities that focus on Indigenous knowledges and explicitly critique colonial histories and presences with immersive media experiences, decolonial

learning moments were experienced that may contribute to broader programs of unsettling colonial power.

Immersive media used:

First Contact https://www.sbs.com.au/guide/article/2016/11/30/experience-your-own-first-contact-through-virtual-reality

Collisions http://www.collisionsvr.com/

Thalu: Dreamtime is Now
https://store.steampowered.com/app/1005940/Thalu_Dreamtime_is_Now/

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