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Adopting technology-based pedagogies for epistemic justice

Increasing learning outcomes in diverse classrooms

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Abstract

Adopting culturally responsive technology-based pedagogies that recognize and accommodate students' diverse learning needs, styles, and experiences is crucial in challenging epistemic justice and improving learning outcomes. The objective was to explore how integrating an understanding of individual students' distinctive traits into developing technology-based pedagogies informed by students' different ways of knowing can increase learning outcomes. In this article, I discuss how adopting culturally responsive technologies in classrooms can redress epistemic injustice and improve learner outcomes by promoting student engagement, hands-on experiential learning, and culturally aware learning. The concept of epistemic justice inspires efforts to enhance learning environments and cultivate a sense of connection and community among students. The cases draw from my experience adopting the intervention and are presented within an analytical framework of culturally responsive technology-based pedagogies in selected hybrid and in-person media production courses.

Keywords: Technology-based pedagogies; epistemic injustice; culturally responsive; equity

1. Introduction

As technology has transformed the landscape of higher education, this article explores how culturally responsive adoption of technology-based pedagogies may address epistemic injustice and improve learning outcomes (Chaudhry and Malik, 2014). Advancements in low-cost digital technologies have transformed how we teach and interact in learning environments (Blessinger and Wankel, 2013). Technologies are rapidly evolving, and there is a need to identify, recognize, and acknowledge biases and challenges that students might face in access to technologies. In this article, my argument is informed by Chaudhry and Malik's (2014) assertion that implementing appropriate technologies in a culturally responsive and inclusive manner can effectively boost student engagement in classroom activities, facilitate the achievement of learning goals, and enhance student productivity. This is also supported by Taylor and Sobel (2011), who argue that learning technologies should be supported by a 'culturally

responsive pedagogy.' In so doing, Blessinger and Wankel (2013, 3-4) point out that it will lead to 'enjoyable learning environments' for both learners and teachers.

Technology can be empowering or exclusionary depending on its adoption and implementation. Feenberg (2009) states that the debate over technologies is between those who assume it is empowering and restoring the public sphere, while critics argue that technologies are an extension of capitalist surveillance technologies and are exclusionary in the nature of their design. While this article discusses the adoption of technology-based pedagogies, it goes beyond the technocentric approach to advocate for cultural responsiveness in informing the adoption of technologies in learning environments. There is a need to acknowledge, recognize, and identify biases and challenges that students face in access to technologies due to factors such as educational system inequalities, economic status, disability, gender, race, ethnicity, national origin, and language discrimination. According to Mayo (2013), the school system favors the cultural capital of the middle class), and therefore, for teachers to achieve effective teaching among diverse student populations, there is a need to understand learners' backgrounds, knowledge, and lived experiences in the implementation of culturally responsive instructional strategies to redress epistemic injustice (Taylor and Sobel 2011).

According to Byskov (2021), epistemic injustice is the idea that students may face unjust discrimination in their roles as knowledge seekers due to biases related to factors such as gender, socioeconomic status, ethnicity, race, sexual orientation, vocal tone, and accent Kidd, Medina, & Pohlhaus (2017, 1) define epistemic injustice as 'unfair treatment relating to knowledge, understanding, and participation in communicative practices.' Epistemic injustice refers to exclusionary practices regarding knowledge, and Fricker (2007) defines epistemic injustice as 'social inequalities rooted in distributive unfairness of epistemic goods such as information or education.' Epistemic injustice, as defined by Fricker, occurs in learning environments in two ways: testimonial and hermeneutical injustice. Testimonial injustice is when students' experiences in the classroom are considered as not being valid or believable, while hermeneutical injustice is when teachers from a different cultural frame misunderstand students' classroom interactions and engagement. Epistemic injustice, therefore, can be summarized as relating to students' classroom experiences about the knowledge shared, how it is shared, and the biases that stem from the school system and learning environments.

I have organized the discussions in this article into four parts. I start with the problem and intervention, describing the issue and how the notion of epistemic injustice and its approach relates to learning and diversity in the classroom. I then describe the intervention that inspired the effort to address epistemic injustice through technology-based pedagogies and how it is applied in practice. In the second part, I discuss the analytical framework guiding the study, which includes a review of related literature on the role of technology in addressing epistemic injustice in education. The framework is framed around the works of scholars such as Miranda Fricker, Gloria Ladson-Billings, Geneva Gay, James A. Banks, Adeyemi Stembridge, and Paulo Freire. In the third section, I employ the framework of culturally responsive technology-based pedagogies to analyze cases from my experience adopting technology-based teaching approaches. I then systematically present discussions from my experience as an instructor in learning environments in global higher education institutions. In the fourth part, I summarize the significance of a culturally informed technology-based framework to enhance understanding the connection between epistemic injustice, diversity, and integrating technology-based pedagogies in diverse classrooms.

2. Problem and intervention

This section looks at epistemic injustice and its relevance to learning and diversity in the classroom. It is crucial at this point to also distinguish between technology-based pedagogies and technology-based education. The latter occurs in several ways, such as using learning management systems, online resources for research and teaching, and even online and hybrid courses. In contrast, technology-based

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pedagogies focus on the philosophy and practices of education. In this article, I analyze technology-based pedagogies within the framework of culturally responsive integration of technologies to address the diverse needs of students and improve learning outcomes. I further delve into the philosophy and practice of deliberate adoption of culturally responsive technologies to develop teaching pedagogies that enhance student engagement and improve learning outcomes. The need to develop culturally responsive technology-based pedagogies is informed by the knowledge that when teachers primarily conduct 'instruction from their cultural perspective,' the interactional structures might seem unfamiliar to students from diverse backgrounds (Taylor and Sobel, 2011) and thereby silence, exclude them, and hamper the achievement of learning objectives.

My positionality on this subject is informed by my teaching philosophies and goals in the teaching pedagogies designed through hands-on experiential learning, student engagement, culturally aware learning, and technology-based pedagogies. The focus on classroom diversity led to creating a learning environment that accommodates and validates different students' learning styles, experiences, and needs. My approach draws from critical pedagogies that seek to identify existing social issues and recognize biases and challenges that students coming to the classes might face due to existing societal problems such as inequalities in the education system, poverty, race, gender, sexuality, ethnicity, national origin, language discrimination, access to technologies and disparities in income levels. The discussions are drawn from prior experience developing culturally responsive pedagogies and driven by varied teaching experiences at different institutions ranging from a predominantly white institution (PWI) to a Historically Black College and University (HBCU). I increasingly began thinking about developing antiracist teaching pedagogies and decolonizing teaching approaches, driven by the need to include the voices of diverse learners and diverse academic resources in the classroom.

The adoption of antiracist and decolonizing teaching pedagogies guided the intervention. It started with bringing diverse readings and resources from scholars of color, women, non-binary writers, artists, and film producers into the classroom. I also started exploring bringing to the classroom more work by global scholars and increasingly centering those voices in classroom readings, resources, and discussions. The course content was also redesigned, particularly the instruction and assessment approaches, with a deliberate shift towards going beyond a student-centered flipped-classroom approach to include interactive technology-based pedagogies. For instance, to make instruction and assessment equitable, there was a shift from weekly readings to a mix of interactive readings, podcasts, and videos with options for students to either read or watch and submit their responses in various formats of their preference. The class assignments and projects were designed to be more experiential, such as urban street ethnographies, where students would take a bus tour of the city, take field notes and photographs, and present them in class. The intervention of centering technology to promote student-centered learning led to the recognition that students responded positively to more technology-based interactive content. This then led to a more in-depth exploration of how the adoption of technology-based pedagogies that are culturally responsive could be used to increase learning outcomes among diverse learners.

3. Epistemic injustice, diversity, and technology-based pedagogies: A conceptual framework

In this section, related scholarly research on the role of technology in addressing epistemic injustice is reviewed to create an analytical framework that anchors the aim of the study, the selected cases, and discussions in the study. The need for a review of literature on the subject is supported by Bond, Buntins, Bedenlier, Zawacki-Richter & Kerres's (2020) argument that reflection upon prior research undertaken in the field is a necessary first step to engage in meaningful discussions on promoting student engagement in the digital age. For instance, research on ‘connections between culture and learning’ was valuable evidence that countered cultural deficit theories developed in the 1960s and 1970s that had erroneously assumed that ‘students of diverse backgrounds were lacking in culture or were disadvantaged by their

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culture' (Taylor and Sobel, 2011, 30). Literature was therefore reviewed on related topics, including epistemic injustice, diversity, equity, student engagement, culturally responsive teaching, and technology-based pedagogies. Scholars who guided the arguments and methods in this work include works by Miranda Fricker, Gloria Ladson-Billings, Geneva Gay, James A. Banks, and Paulo Freire.

3.1 Epistemic injustice

The key aspect of Freire's work is the emphasis on education as political (Mayo, 2013) and the inequalities and injustices evident in the classroom because of the oppressive and systemic injustices in society. It is imperative to reflect on the context that shapes 'students' perceptions of opportunity,' given the 'sociopolitical realities of the communities served by the school' (Stembridge, 2020, 11). Therefore, the importance of epistemic injustice goes beyond ethical theories to encompass political theories on power, public discourse, and public institutions, such as schools, universities, courts, and healthcare (Byskov, 2021). For instance, because epistemic injustice wrongs one in their capacity as learners (Fricker, 2007), the push for epistemic justice can be viewed from a framework of decolonization where the cultural experiences of students from minoritized communities are foregrounded, and their knowledge is not silenced or excluded in classroom discussions. In this case, a deliberate acknowledgment of different forms of knowing and cultural experiences within the classroom can be viewed as decolonial approaches, and educators can draw on indigenous and de-colonial scholarship to inform pedagogies for classrooms as intercultural and diverse spaces to serve better students whose voices are silenced and marginalized (Pirbhai-Illich, Pete, & Martin, 2017).

Fricker categorizes epistemic injustice as testimonial injustice and hermeneutical injustice. In testimonial injustice, one is 'wronged in their capacity as givers of knowledge,' In hermeneutical injustice, one is 'wronged in their capacity subjects of social understanding' (Fricker, M. 2007, 7). For many teachers, the 'sociological lens they bring to the classroom links directly to lessons and values experienced from their primary culture' (Taylor and Sobel, 2011, 5), thus predisposing students to different forms of epistemic injustice. The primary form of epistemic injustice is testimonial injustice, whereby 'prejudice on the hearer's part causes the hearer to give the speaker less credibility than would otherwise have been the case' (Fricker, 2007, 4). The prejudice can result from biases and stereotypes that hearers (teachers) might have about certain cultures or communities. Stembridge (2020, 28) asserts that students should have the 'opportunity to develop their tools as knowledge creators' as writers and media producers by 'learning with and from their fellow students whose skills and understanding are part of a whole' and in a supportive space where everyone gets to contribute something valuable to others. While individuals 'do not perpetrate hermeneutical injustice, it is apparent in discursive exchanges between individuals' (Fricker, 2007, 7). For some learners, school culture can be so different from their 'home and primary cultures' that learning at school is 'challenging, alienating and exclusionary' (Taylor and Sobel, 2011, 5).

According to Byskov (2021), it is essential to constantly 'recognize and address epistemic injustice because our classrooms mirror society.' Byskov further discusses how non-epistemic forms of discrimination and injustice manifest in forms not considered epistemic injustice and proposes three conditions for determining epistemic injustice. They include the 'stakeholder condition,' 'epistemic condition,' and 'social justice condition.' The stakeholder condition states that the discriminated individual or group must be affected by the decisions they are excluded from influencing; the epistemic condition states that the discriminated individual or group must possess relevant knowledge for the decision-making process; and the social justice condition states that the discriminated individual or group must suffer from other social injustices simultaneously. Those who are epistemically advantaged have a better opportunity to raise their concerns while disadvantaging the epistemically disadvantaged groups.

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3.2 Student diversity

Diversity encompasses the recognition of individual uniqueness, acknowledging disparities, and transcending mere tolerance to fully embrace and celebrate the diverse facets of humanity within a supportive, affirming atmosphere (Patrick & Kumar, 2012). A broad range of factors, including age, race, ethnicity, religion, socio-economic status, national origin, ability, language, and gender identity, influences student diversity. Cultural diversity, often resulting from language, race, ethnicity, national origin, and gender identity, also influences how students think, perceive, behave, and communicate. All this then affects how instructors teach and students learn (Taylor & Sobel, 2011, 29). Therefore, acknowledging the plurality of learning styles among students and understanding students' backgrounds is essential to understanding how students learn and think (Jabbar & Mirza, 2017). Individual students' abilities and achievements cannot be considered independently of opportunities provided by their social contexts. Thus, a comprehensive approach is needed to evaluate student diversities, epistemic justice, and education contributions (Walker, 2019, 163). Applied to students' diversity, epistemic (in)justice implies a particular commitment to the idea that uniqueness should inform teaching, pedagogy, and assessments.

Culture is a complex concept that needs to be defined or operationalized (Androsov & Zhang, 2023) because of its intersectional nature, spanning various categories such as ethnicity, race, nationality, religion, and language. It can be broadly defined as systems of shared beliefs, values, and practices that individuals interpret and understand their experiences and worldviews (Hall, 1997). It is also a shared system of meaning for analyzing the world, guiding action, and facilitating communication (Nastasi, Arora & Varjas, 2017). Culture is central to learning and pervasive in people's ways of knowing and responding to life (Taylor and Sobel, 2011, 36). Gay (2018) argues that culture is central to how learning occurs in the classroom, and this argument is reinforced by Stembridge (2020, 80), who adds that culture affects how people learn, remember, reason, solve problems, and communicate. Therefore, it is part and parcel of students' experiences. Unfortunately, sometimes educators assume homogeneity within a cultural group, yet students who share cultural, racial/ethnic, cultural, linguistic, or religious backgrounds can vary dramatically in their cultural perspectives (Taylor and Sobel, 2011, 103). According to Saltmarsh (2022), such assumptions of cultural homogeneity within mainstream or dominant cultures limit education, as the curriculum becomes a tool for assimilation and a corrective to heterogeneity. Saltmarsh argues that understanding culture as heterogeneous everyday life practices promotes a more nuanced understanding of diversities within and between cultures. As teachers recognize how culture influences how one thinks, believes, and behaves, they begin to understand how culture affects their teaching and expectations about teaching and students' learning and classroom interactions (Taylor and Sobel, 2011, 41).

3.3 Equity gaps

Culturally responsive education helps identify themes and tools of practice for closing equity gaps. However, it is challenging for educators because of the ‘indoctrination of the equality frame of reference’ to give everyone the same thing instead of equity, which calls for differentiating according to need (Stembridge, 2020). According to Taylor and Sobel (2011), all students deserve an equitable education. For systems to become more honest, they must intentionally focus on growth and acknowledge the ‘historical intersections of racism, economic conditions, and political disenfranchisement’ that contribute to present-day realities where some students are more vulnerable and, therefore, more likely to have lower learning outcomes (Stembridge, 2020). According to Walker (2019, 163), factors such as ‘ethnicity, language, gender, and disability, including the actions of others’ in learning spaces and the ‘relationships within which education processes are embedded, shape what each person can do and be’ For instance, for ‘American middle-class students and native English speakers, school aligns with what is familiar,’ while on the other hand, students with diverse backgrounds such as migrant students and those from lower-

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income families have a 'wealth of cultural capital, but it may not correspond with the school's unspoken, subtle expectations' (Taylor and Sobel, 2011, 32).

Equity gaps affect how students perceive their opportunities in school. Still, as Stembridge (2020, 11) points out, it is essential to note that not all equity gaps originate in school or classroom practices. Equity gaps are often a reflection of the broader society. For Instance, the 'US education system assigns social capital to European American English-speaking middle-class culture,' and because 'schools reflect the knowledge and values of mainstream culture, they reinforce the culture in school activities, including instruction, curriculum, and assessment' (Taylor and Sobel, 2011, 32). The design of the learning environment plays an essential role in successful online learning (Parker, Maor, & Herrington, 2013), and rather than solely prioritizing resource inputs and indicators as the gauge of educational success, a quality education should strive to enhance students' capabilities. This includes the substantial freedoms each student can exercise in various ways that contribute to their flourishing and align with their values. (Walker, 2019). For instance, systemic oppression often affects members of minoritized and racialized groups who also live under 'constant threats of xenophobic, random, and unprovoked attacks' (McLaren, 2016). Teachers can create a classroom context that signals a valuing of broad cultural diversity and a commitment to equity (Taylor and Sobel, 2011) by recognizing the diversities among students and adopting technologies and tools that allow students to express themselves or create content that is reflective of their backgrounds, knowledge and lived experiences.

3.4 Student engagement

Kotzee (2017) posits that education aims not solely to acquire knowledge but also to generate knowledge within the institutions where education occurs actively. This is particularly important as higher education is evolving and rapidly deploying various digital technologies in learning environments. Understanding how students engage with the technologies is crucial, as this is critical to designing flexible and adaptive learning environments to cater to diverse students (Nkomo, Daniel, and Butson, 2021). Over the past decade, the conceptualization and measurement of 'student engagement' have received increasing attention from researchers, practitioners, and policymakers alike (Bond, Buntins, Bedenlier, Zawacki-Richter & Kerres, 2020). Student engagement refers to the energy and effort students employ within their learning community, observable through behavioral, cognitive, or affective indicators (Bond, Buntins, Bedenlier, Zawacki-Richter & Kerres, 2020). Stembridge (2020, 70) refers to engagement as the 'money ball of education' because if 'students are not engaged, we can have a chance to teach them, but if a student checks out during instruction, we cannot teach them anything until we re-engage them.' Teachers need to understand how students engage with digital technologies to train students and support their learning (Nkomo, Daniel, and Butson, 2021).

Stembridge (2020, 69-70) asserts that engagement can be an elusive target. So, we must often innovate and explore to locate the most appropriate strategies, and when doing so, it is essential to consider the following questions:

> *How does instruction engage students behaviorally, affectively, and cognitively?*
> *How does the lesson itself model what engagement looks like for students?*
> *How does the lesson differentiate for highly engaged, moderately engaged, and minimally engaged students?*

Today, technologies are becoming more prevalent in higher education to engage students better and create more participatory and engaging learning environments (Blessinger and Wankel, 2013). As a result, a growing body of research is exploring how technology might be used to support effective and efficient feedback practices for students (Hepplestone, Holden, Irwin, Parkin, and Thorpe, 2011). Blessinger and Wankel (2013, 7) argue that technologies should allow students to feel more comfortable engaging with the class in a lower-risk way than calling out students by name. Stembridge (2020, 71) points out that having a specific language to describe engagement is crucial because sometimes educators

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view engagement from students as disruption. However, at other times, they view disengagement as compliant engagement. These technologies may provide introverted students who may not be inclined to speak out in front of their classmates for fear they may give the wrong answer, a relatively low-risk way to engage with the rest of the class (Blessinger and Wankel, 2013). According to Stembridge (2020), students' engagement in learning can be seen as a product of their dedication and efforts. This can also be facilitated by employing various technologies that enable them to interact with their peers and the instructor. However, increased participation from adopting technology alone is unlikely to yield more effective learning if the technology tools are not used contextually and purposefully (Blessinger and Wankel, 2013). Adopting classroom technologies provides educators with many possibilities and opportunities to enhance and transform how instructors interact with students and how students interact with each other (Blessinger and Wankel, 2013, 4). Engagement is a function of identity, and if we can understand and leverage engagement well, we are, in effect, supporting students in cultivating uniqueness that will allow them to justify the effort necessary for success in school (Stembridge, 2020, 69).

3.5 Culturally responsive pedagogies

Culturally responsive pedagogy is student-centered and recognizes the importance of students' cultural backgrounds, realities, experiences, and lived experiences (Ladson-Billings, 1995). It is influenced by social justice and multiculturalism. It refers to drawing from ‘cultural knowledge, prior experiences, frames of reference, and performance styles’ of ethnically diverse students to make learning more relevant, meaningful, and effective for learners (Gay, 2010, 31; Taylor and Sobel, 2011, 16). It can be viewed as a 'contextual and situational process' for both the learners and teachers, whereby when teachers link students' cultural knowledge and lived experiences to the content and teaching methods in the classroom, the experiences and academic performance of learners from culturally diverse groups significantly improves’ (Taylor and Sobel, 2011). McLaren (1989, 117-118) further points out that teachers who adhere to culturally responsive pedagogies often ‘capitalize on their students' home and community culture; empower students using cultural referents; and urge collective action through artistic experiences and ways of knowing.’

Taylor and Sobel (2011, 96), in their book C*ulturally Responsive Pedagogy: Teaching Like Our Students' Lives Matter,* assert that a foundational part of effective teaching involves teachers gathering and using information about the background, knowledge, and prior experiences of learners to do the following three things:

Plan to implement the curriculum.
Make decisions about instructional strategies.
Design a classroom environment for learners to engage as a community of learning.

Ladson-Billings (1995) refers to culturally relevant pedagogy as addressing student achievement and helping students embrace and validate their cultural identity while fostering critical perspectives that question and address the inequalities perpetuated by schools and other societal institutions (469). The actual objective of the school, which is the learning experience, can be realized through a culturally responsive pedagogy that provides students with meaningful opportunities to incorporate their cultural identities and fluencies to enhance their thinking abilities and engage in productive actions with others (Stembridge, 2020). Centering different cultural experiences in the classroom gives ethnically diverse students a platform to succeed (Jabbar & Mirza, 2017, 36). Culturally responsive refers to a dynamic or synergistic relationship between home/community culture and the school culture (Ladson-Billings, 1995). Teachers and learners come to school as rich cultural beings with different cultural backgrounds that influence their perceptions, values, language, and expectations (Taylor and Sobel, 2011, 33). Jabbar & Mirza argued that academics relate instructional resources to student backgrounds, histories, and experiences (Jabbar & Mirza, 2017, 36).

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Although adopting digital technologies in classrooms is a relatively recent development of the post-industrial era, various schools of thought and societies have influenced the concept of culturally responsive pedagogies throughout history. One such approach is the philosophy of *Bildung,* which emphasizes self-cultivation and lifelong learning. It entered German pedagogical thinking in the late eighteenth century and was promoted as a foundation for thinking to liberate the individual from former societally predetermining structures (Hogstad, 2021). The analytical framework for culturally responsive technology-based pedagogies in this study, however, goes beyond an emphasis on the individual's self-cultivation and social responsibility to recognize that systemic injustices marginalize ways of knowing learners, and by adopting technologies in a culturally responsive practice, we allow learners to engage from their varied lived experiences

3.6 Technology-based pedagogies

In this article, technology-based pedagogies are conceptualized as adopting a wide range of technologies in classes through instructional strategies, student engagement, classroom activities, and projects to help improve student learning outcomes. The emphasis is on using a wide range and mix of technologies to promote student engagement informed by students' diverse and unique needs in the classroom. Technology-based learning should encourage student engagement, challenge epistemic injustices in classrooms, and create technology-rich spaces where students have a sense of connection and community. Technology-rich environments can be conceptualized as classroom spaces that provide access to digital technology, develop skills with digital technology, and enact and support the usage of digital technology (Zinger, Tate, & Warschauer, 2017). Early recommendations about teacher preparation for teaching with technology included lists of technology skills and techniques that teachers needed; however, attention has shifted to integrating technology into the curriculum and recognizing that being a competent technology user is different from knowing how to teach effectively using technology as a teaching pedagogy (Wallace, 2004).

In the context of access, skills, and usage, technology-rich environments depend on the teachers who instruct the students as much as they rely on the availability and affordances of the technology itself (Zinger, Tate, & Warschauer, 2017). The focus is not on the challenges posed by the cost or access to technology in the classroom but instead on how to best use technology in a way that is most relevant and appropriate to the course and one that suits the pedagogical preference of the instructor (Blessinger and Wankel, 2013, 8). Technology positions teachers to support student learning when integrated into a program that aligns curriculum, instruction, and assessment in a rigorous and constructivist learning environment (Zinger, Tate, & Warschauer, 2017). There is no one right way to use technology for all courses. Instead, each instructor will figure out how to appropriately use these technologies in the context of the course (Blessinger and Wankel, 2013, 4). The technology-based pedagogy approach discourages a technocentric approach, such that the focus, for example, is not on learning to collaborate through Google Documents but on how the teacher explains and facilitates the use of technology in the peer editing process (Zinger, Tate, & Warschauer, 2017).

Adopting technology-based pedagogies has several challenges that need to be addressed for effective, culturally responsive teaching in the classroom. Chaudhry and Malik (2014) Point out that while there have been concerns about time management and student self-regulation when using technologies, they reinforce that the issue can be addressed by a well-managed lesson plan and designing activities throughout the course to keep students engaged within the module. Another problem is that using technology to teach subject matter requires subject-specific knowledge about technology, curriculum, and the intersection of these domains (Wallace, 2004). Another concern is that even schools with sufficient resources may need help keeping up with the ever-evolving need for increased bandwidth and computing power, frequent requirements for device updates, and hardware obsolescence or wear (Zinger, Tate, & Warschauer, 2017).

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4. Cases from personal teaching experience

This section is informed by selected cases from my teaching experience to discuss the intersectionality of technology, culturally responsive pedagogies, and epistemic injustice. I deliberately tell this story from my viewpoint as an instructor in higher education, trying to explore how to promote student engagement and increase learning outcomes while redressing epistemic injustices that historically underserved students often experience in educational settings. The cases and discussions below were generated from experience teaching both face-to-face and hybrid courses and informed by firsthand knowledge of implementing technology-based teaching methods. My teaching experience spanned various settings ranging from the higher education institutions in the global south to the global north and, further still, from a historically black college and university (HBCU) to primarily white institutions (PWI).

The article aims to explore and detail how an intervention of culturally responsive adoption of technology-based pedagogies can promote learning outcomes among diverse students with unique learning styles and needs. In my teaching experience, I explored the adoption of technologies from two approaches. Firstly, to help students recall foundational knowledge through activities such as reflections through blogs, videos, and online peer reviews. Secondly, to help students master skills such as web design through collaborative group projects, proficiency in photography through street ethnographies, and non-intrusive and non-extractive video productions through interviewing and producing short documentaries and podcasts for community elders, local non-profits, and community partners.

At the beginning of the semester, I would assign technology-preparedness quizzes to gather regular student feedback. Technology preparedness quizzes were administered to students before their first lecture. This was useful in designing culturally responsive pedagogies with knowledge of each student's technology access, experience, and attitudes. The quizzes helped gather information about students' various skill sets coming to class. The survey asked students about their access to reliable Internet and laptops or desktop computers, proficiency in Adobe Creative Suite, knowledge of cameras and microphones, and prior experience using WordPress, YouTube, Google Docs, and Google Jamboard. Afterward, I would assign weekly reflection activities, especially in courses using community-engaged experiential learning pedagogies. For the weekly reflections, the applications included online blogs on the class website, online discussion boards on the Learning Management System, and unlisted YouTube videos for students to reflect on what they had learned each week and which activities they enjoyed the most.

Exit tickets were also administered every other week to get regular feedback. The exit tickets were concise questions posed to students at the end of the classes about their learning and enjoyment levels for the class activities and any learning activity they felt needed to be changed, removed, or adapted into another format. Additionally, course evaluations were conducted - one after midterms and another by the university at the end of the course. For the end-of-semester course evaluations, I often modified the course evaluation questions by adding additional questions that specifically addressed technology use in the classroom. I frequently used the feedback from course evaluations assigned after midterms to make any adjustments before the end of the semester. On the other hand, the end-of-semester course evaluations were helpful for me in taking note of areas of improvement as I prepared for the next class.

Initially, all courses were taught in person and synchronously. However, due to learning disruptions resulting from the COVID-19 pandemic, some courses that employed these strategies transitioned to hybrid delivery. This article only covers the in-person and hybrid courses rather than the online asynchronous courses, as they demanded a different approach towards asynchronous student engagement in the online classroom space, which was a big challenge, especially for hands-on media production courses. While this intervention was also adopted in fully online asynchronous courses, this article needs to discuss my experience with adopting technologies in online asynchronous classes. Thus, this article focuses on my experience adopting culturally responsive technology-based learning in courses to promote

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student engagement and increase learning where the students at least had face-to-face interactions with the instructor.

In this section, I explore and review how the intervention could promote student engagement and create classroom spaces where students have a sense of connection and community and, by so doing, challenge epistemic injustice that diverse students experience in the classroom. The following questions frame my discussions:

How does adopting technology-based learning promote student engagement and create classroom spaces where students have a sense of connection and community?

How does adopting culturally responsive technologies center minoritized students as knowers and redress epistemic injustice?

How can technology-based pedagogies help promote student engagement and increase learning outcomes?

5. Discussions

The discussions of the cases below were informed by my experience as an instructor adopting technology-based pedagogies for media production courses to help improve learning outcomes. The pedagogies were anchored in recognition of the classrooms as online and in-person lectures/labs/spaces where diverse learners interact and engage with content to master terminology and production skills relevant to each media production course. In addition to emphasizing mastery of technical terminology and skills in digital video production, web design, audio production, publication, editing, and design, the courses also required students to be familiar with various Adobe Creative Suite Applications, including Photoshop, Lightroom, InDesign, Audition, Premiere Pro, and After Effects.

I will mainly reflect upon the following four cases in this article and discuss how adopting culturally responsive technology-based pedagogies helped increase learning outcomes in those areas. Thus, the discussions about adopting technology-based pedagogies to promote student engagement and improve learning outcomes are framed and discussed below through culturally responsive implementation of technology-based pedagogies. They are structured around four fundamental elements: cultural relevance, student-centeredness, experiential learning, and technology-based.

5.1 Culturally relevant

I used several approaches to address how adopting culturally responsive technologies centers minoritized students as knowers and redress epistemic injustice. At the start of the semester, I posted two short online quizzes on the Learning Management System (LMS) that were referred to as the "syllabus response quiz" and "technology-preparedness quiz." The technology quiz helped generate student access, experience, knowledge, and attitudes toward technology. The syllabus quiz helped me understand students' preferred methods of communication, classroom engagement, accessing academic resources, and methods of assessment and feedback. A discussion forum was also created on the LMS where students could share information that they felt comfortable with regarding their majors, hobbies, hometowns, favorite historical figures, and any inspiring quotes.

The feedback from the quizzes was also helpful in designing course activities, teaching strategies, and assessments customized for each course with several options based on student's interests, preferences, and lived experiences. This information was also valuable in helping them glean their expectations of the course, attitudes, and lived experiences. As a result, course materials had to be developed and customized specifically for each class, informed by preliminary familiarization with the students enrolled in the course through the short online quizzes and discussion forums. The final project was also redesigned in multiple formats, such as research papers, podcasts, short documentaries, or websites, that focused on a social issue, topic, or even social movement they were working on throughout the semester. The objective

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was for students to select various topics based on personal experiences and choose diverse formats, with a range of distribution among research papers or creative projects such as podcasts, videos, and websites.

Further, to promote diverse perspectives, the adopted class readings represented writers from diverse backgrounds and culturally relevant pedagogies that enabled students to connect with and relate to teaching resources based on their personal experiences, needs, and challenges. To do this effectively, the first step was understanding the students' diverse cultures, knowledge, and experiences in the course. I adopted various teaching resources in the courses on the intersectionality of race, gender, sexuality, language, and power. This was done using a wide range of academic resources, from assigning students' weekly readings by women of color such as Ruha Benjamin, Safiya Umoja Noble, and Gayatri Chakravorty Spivak to global scholars such as Achille Mbembe, Paulo Freire, and Frantz Fanon. Adopting diverse voices in the classroom elicited more student discussions and cognitive and affective engagement in classroom activities. Selecting the course readings, including academic sources from prominent black scholars in the design field, was crucial, as students of color could connect and identify with those course resources. The selection of works of scholars of color also encouraged discussions that challenged the historical colonial bias of the education system that had marginalized the contributions of black scholars.

5.2 Student-centered

While the first case focused on culturally relevant pedagogies, the second focused on adopting culturally responsive technology-based learning to promote student engagement and create classroom spaces where students had a sense of connection and community. In this case, a variety of interactive teaching strategies were adopted, such as small group workstations, street ethnographies, brainstorming on online discussion boards, reflections through blogging or videos, games, and puzzles, and collaborative content creation for digital portfolios to promote student engagement in class while also recognizing and providing for diversity among students. This is because one teaching style does not work for all students, and if students feel left out, they will not participate in classroom activities. It was, therefore, essential to adopt technology in a way appropriate for the culturally responsive pedagogical approach and the context of the learning environment, such as the nature of the course, the learning objectives, and the learning needs of students (Blessinger and Wankel, 2013, 4).

The student-centered approach focused on various interactive activities and projects based on the content being taught and the skills expected for the learners to master. To achieve this, individualized instruction was a crucial component in the teaching. In this case, worksheets were used where students could work depending on their varied skills and levels of proficiency, for example, in using Adobe Creative Cloud apps. This helped increase student engagement by promoting interactivity in the classroom and ensuring students stayed engaged in cases where they quickly completed assigned tasks ahead of their classmates. They were able to proceed at their own pace using the assigned worksheet. In contrast, the others received individualized support, such as proficiency in Adobe Premiere Pro or designing websites using HTML and CSS.

Students were made aware that the instructor would be available to them outside the scheduled class time for further clarification after the content had been taught.

When designing the courses, there was a need to rethink what is meant by student engagement and how it feeds into epistemic injustice if we frame student engagement as students speaking up in class because often then, the voices we hear might not be representative of all the students. This was also considered in rethinking how to be equitable when we grade participation because students engage differently in classes based on their cultural frames. Students also have preferences for different learning styles. It was, therefore, essential to validate the other student's learning styles by incorporating various learning activities based on the feedback from the short quizzes at the beginning of the semester. It was complemented by feedback that students shared during the semester.

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There are three student engagement types: behavioral, affective, and cognitive (Stembridge, 2020, 71). Different tools were used to increase student engagement, ranging from online quizzes, online discussion boards, weekly reflections through blog posts, video responses to weekly readings, collaborating on Google Docs, small group workstations in class, and mapping activities to documenting urban street ethnographies. Behavioral and affective engagement was primarily emphasized in the courses, which focused on community-engaged learning. Therefore, learners had to create media content for community partners. Supplementing the community-engaged activities were asynchronous online discussions, which proved highly beneficial for cognitive engagement. By providing a space where students could participate without being called out by name and without feeling pressured to have all the answers, these online discussions were a valuable addition to the learning experience. The asynchronous online discussions allowed students more time to think about their answers and engage in conversations without the expectation of 'having all the answers.' Instead, they offered spaces where they could learn from each other. Assigning weekly reflective blog posts and video responses to readings proved an effective method for increasing student engagement, particularly for those who preferred expressing themselves through blogs or videos instead of written responses. In other cases, classroom activities involved students collaborating on Google Docs and WordPress to work on assignments and projects. Using Google Docs and WordPress sites allowed students who were uncomfortable speaking up in class at a particular time to add their input in the collaborative documents while discussing in style with their peers.

5.3 Experiential/community-engaged

According to Blessinger and Wankel (2013), learning involves aligning the course objectives with relevant, real-world learning experiences. When students are presented with activities that are authentic and meaningful to their personal lives, they are more inclined to engage with enthusiasm. In this case, I created opportunities to use technologies to apply course content outside the classroom. In adopting this approach, the first step was familiarization with the community, local non-profits, local media organizations, and local community events. Capturing visuals, such as videos and photographs of significant landscapes, architectural structures, and historical buildings, was also essential.

Further, bringing pictures of local and familiar places to the classroom enabled students to connect to what was being taught. For instance, images and videos taken during the Black Lives Matter protests in Philadelphia and Washington, DC, were used in courses centered around media activism and social movements. I brought to class content that students could relate to and opened opportunities for more conversations around media, technology, and broader social issues in their local communities. The focus was for students to get hands-on experience, and a significant component of the courses was to get students out of the classroom and get them involved with local communities.

In courses designed around community-engaged learning, there was more emphasis on using non-intrusive technologies and non-extractive approaches when working with communities. In media production courses, I assigned students to document street ethnographies through visual essays, interviewed local non-profits, and submitted short documentaries. They also used different tools to engage local representatives, created online petitions, used digital media for resource mobilization, and hosted an event with a community partner for a social cause. One activity highlighting students' knowledge of various social causes and movements was collaboratively developing an activist social network that students designed and used to share stories about social causes and movements they researched. It was a public-facing site, and therefore, it grew beyond the limits of the classroom walls. Rules of engagement were set initially on how to use the activist social network and the need to be respectful, and this was evident in how students designed, developed, and engaged in conversations, content creation, and sharing content on the activist social network in the *Civic Media* course. The activity improved student engagement and learning outcomes as they could relate the course material to real-life situations.

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In other courses, at the beginning of the semester, students selected from a list provided the community partners they collaborated with throughout the semester. They then worked on mastering technical skills in the classroom and the experiential element of creating content for the community partners. For instance, they created fliers and other publication materials such as logos and posters. From the conceptualization of fliers and pamphlets to sharing drafts and finally submitting the approved final product to the partners, they collaborated with the partners throughout the entire process of design and publication. Other forms of content created were podcasts. They worked through developing a podcast, developing a concept for the podcast, identifying guests, and interviewing them about social movements on their podcasts. We also had students who completed websites for various global social movements they were researching in the semester.

5.4 Technology-based

In the case of adopting technology-based pedagogies, the courses were approached as a laboratory where students were encouraged to experiment with technologies they preferred and adopt different digital tools to engage in the classroom. The academic resources of the courses were a mix of readings, guest speakers, podcasts, videos, and a wide range of global films. Students were also asked to reflect weekly through blogging or unlisted YouTube videos on the technologies they used for their projects and whether that had increased their overall engagement with the course content. Different technologies were adopted for various courses based on the expected learning outcomes for each course.

In the courses, students were encouraged to identify a social cause and work with various digital media technologies to address emerging concerns about the social cause. In this course, some students selected the option to create websites for social causes, while others created podcasts and interviewed guests about social movements. Students were also allowed to write a research paper for this course. For those writing a research paper, they created a Google Drive where they organized all their resources and drafts in folders and worked from a Google Document with a shareable link to allow for comments and corrections. Students could also engage with social movements through digital technologies, such as building an activist social network. The production techniques were also taught by assigning students to interview community partners and local non-profits as part of an ethnographic experience. Students could engage with communities firsthand by going beyond the theoretical content and focusing on experiential learning. This approach is supported by Blessinger and Wankel (2013), who posit that building social learning communities within the classroom has the potential to center voices often on the periphery, foster a greater sense of belonging, interactivity, and group cohesiveness which are essential factors in student motivation and their willingness to participate in such communities.

Through the community-engaged courses, students could master technological skills and use the skills in camera production, editing using Adobe Premiere Pro, sound editing through Adobe Audition, and motion graphics through After Effects to create media content for community partners. Students worked in groups and shared Google Drive and Google Docs, where they uploaded their breakdown sheets, location agreement forms, and media release and consent forms signed by participants. They also had an online forum where they could share their updates with the rest of the class while in the community and ask questions if they experienced any hitches with their cameras, lenses, batteries, or even tripods.

From the above discussions, the framework for culturally responsive technology-based pedagogies emphasized epistemic justice, where students were recognized as knowers of knowledge from their primary cultures and their lived experiences. Their feedback was also influential in evaluating the case studies, and by continually reviewing the feedback, I could see an improvement in student engagement in classes and their learning outcomes. A culturally responsive approach to adopting technologies was vital in creating classroom spaces where students were stimulated to engage in different and unique ways with the course content.

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6. Conclusion

From the discussions above, it can be concluded that adopting culturally responsive technology-based pedagogies is essential in redressing epistemic injustice in higher education. This is supported by the findings that show that student learning outcomes improved when they engaged with technologies in a way that reflected their lived experiences and interests. Students could show their mastery of the knowledge and skills by selecting their preferred technologies for weekly reflections, such as Google Documents, online classroom discussion boards, blogging on WordPress, or creating a video. Using technologies, they could relate to their varied experiences, and each appreciated how course content could be learned differently.

Technologies have historically been exclusionary in design, adoption, and access. Therefore, the subject of technology-based pedagogies often creates questions and deliberations on the challenges of access and adoption of technologies by historically underserved learners. However, approaches to learning technologies that are more responsive to students' diversity, such as the culturally responsive technology-based pedagogies framework suggested in this study, can be influential in addressing the epistemic injustice associated with the misrecognition and suppression of this diversity. The adoption of culturally responsive technology-based pedagogies should promote classroom spaces that validate learning communities for all students, especially students from diverse backgrounds (Taylor and Sobel, 2011, 117), and work towards 're-positioning power, authority, voice, and praxis' in pedagogical practices (Pirbhai-Illich, Pete, & Martin, 2017, 17). According to Zinger, Tate, and Warschauer (2017), technology should broaden and enrich students' learning experiences. Additionally, Byskov (2021) suggests that by identifying the factors contributing to epistemic injustice, we can systematically assess allegations of harm against knowers and take steps to prevent the perpetuation of current socio-economic inequalities.

While this article focused on culturally responsive technology-based pedagogies for redressing epistemic injustice in hybrid and in-person courses, there is a need for further research on the adoption of culturally responsive technology-based pedagogies in fully online classes. More research is needed on the challenges of understanding students' diverse backgrounds and lived experiences and creating collaborative spaces and a sense of belonging in fully online classes while adopting culturally responsive technology-based pedagogies. Students have unique learning styles, needs, and experiences, which should inform the adoption of teaching pedagogies, instructional strategies, and student assessments. In Stembridge's (2020, 27) words, we cannot say equity has been achieved until neither the identities of students, such as race, ethnicity, gender, and socio-economic status, are reliable predictions of a school's achievement and performance.

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