Studies in Art Education

A Journal of Issues and Research

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/usae20

Collaborative Video Game Design as an Act of Social Justice

Renee Jackson

To cite this article: Renee Jackson (2022) Collaborative Video Game Design as an Act of Social Justice, Studies in Art Education, 63:2, 134-151, DOI: 10.1080/00393541.2022.2050985

To link to this article: https://doi.org/10.1080/00393541.2022.2050985

Published online: 15 Jun 2022.

Studies in Art Education: A Journal of Issues and Research
2022, *63*(2), 134–151
DOI: https://doi.org/10.1080/00393541.2022.2050985

"Video game design has an important role to play in education related to access, inclusion, and student-centered pedagogy."

Collaborative Video Game Design as an Act of Social Justice

RENEE JACKSON
Temple University

This research is about bringing social justice art education into classrooms through the medium of video games and exploring the ways in which video game design can be a learning tool that can make contributions to and engage in social justice work. Drawing from a case-study research project with a small group of middle school students, through the lens of critical pedagogy informed by recent work by Dipti Desai, this project examines how learning happens through dialogue and knowledge weaving. Findings have led me to consider the potential of this type of video game design as a site of resistance and transformation in art education.

Correspondence regarding this article may be sent to the author at renee.jackson@temple.edu.

Introduction

Arcade our Way (AoW) is an inclusive video game–design intervention that can take place in formal and informal educational contexts. It promotes social impact/social change game design as an expressive medium for all creators and seeks in particular to engage those whose stories and concerns are not often represented in mainstream games (Jackson & Sheepy, 2019). The purpose of the research component is to investigate the way learning about game design and social issues happens best through collaborative design, when "best" is considered through the lens of critical pedagogy (Freire, 1970/2008) and informed by recent work by Dipti Desai (2020). The focus of this research article is on the way learning about climate change happened through the process of collaboratively designing the game *The Air We Breathe* (AoW, 2020). The concept of "knowledge weaving" emerged from this work. Knowledge weaving is what I have come to refer to as the collaborative game-design process wherein all participants bring knowledge about the issue to the table and weave it into the backstory and narrative of the game. Other key learning happened through this process as well, including questioning game tropes, having conversations about representation, and engaging negotiation skills.

The metaphor of weaving also prevails when one looks at the larger picture of this work. As an approach to social justice art education, the project weaves together at least four strands of social justice related to accessibility, inclusion, and student-centered pedagogy. Regarding access and inclusion, it provides the opportunity to learn about video game design from an art education perspective rather than, as it is more commonly taken up, within the domain of computer science and computer programming. It also provides an access point to learning about video game design that is not guaranteed in schools, while also introducing the idea of game design as a potential career path within an industry in need of a more diverse workforce. Finally, as a student-centered initiative, it provides opportunities to learn and communicate ideas about social justice issues through a medium that is loved by many children and youth and to engage more critically with this extremely popular medium. I will provide further detail about each of these strands in the literature review.

Literature Review

Social Impact Video Game Design and Art Education

Social impact video games, also known as social change, social justice, or humanitarian games, are made to impact or affect the way the player may think about and behave in relation to social justice issues, although there are many interpretations of what this means, how to do it, and whether they even have an impact (Arora & Itu, 2012; Baranowski et al., 2008; Cunningham & Crandall, 2019; Jackson, in press; Jackson & Sheepy, 2019; Whitson & Dormann, 2011). At the K–12 level, as described above, game design is most often taught from the perspective of coding and computational thinking within the context of

computer science and STEM (Kafai & Burke, 2015; U.S. Department of Education, 2020), rather than from the perspective of creativity and design within the context of art and design (Peppler, 2010; Sweeny, 2010). Video game design as a learning tool is a growing area of research (Bates et al., 2009a, 2009b; Kafai, 2006; Thumlert et al., 2018), although it has received much less attention than *playing* games for learning (game-based learning; Thumlert et al., 2018). Within the game design for learning literature, most current attention is focused on game design as a vehicle through which to learn coding and computer programming (Kafai & Burke, 2015; Salen, 2007; Wu & Wang, 2012). Research about game design as a process through which to learn academic subjects is the next most common area of game design for learning research. Among this work, most studies address learning math (Kafai, 1995, 2003; Kafai & Burke, 2015; Ke, 2014), science (Kafai, 2003; Kafai & Burke, 2015), and language arts (de Paula et al., 2018; Kafai & Burke, 2015). Game design has been used to explore issues related to social justice (Ingram-Goble, 2013; Ruggiero et al., 2013); however, very few game design for learning studies have investigated social justice–related learning through the design of social impact games (Ingram-Goble, 2013; Ruggiero et al., 2013; Thumlert et al., 2018).

Within art education, game-design research directly related to learning about social justice has taken place (Ciampaglia & Richardson, 2015, 2017; Parks, 2008). Other exciting game design–related work within art education has emerged in various ways related to game jams (Meriläinen et al., 2020), work with preservice teachers (Patton et al., 2020), secondary art curriculum initiatives (Alexander & Ho, 2015; Gill, 2009; Patton, 2013), and game design as a teaching tool (Keifer-Boyd, 2005).

Although game design is promoted within academic art education circles (Patton et al., 2020), there are many challenges that can interfere with program delivery at the K–12 levels, including policy decisions (Patton & Buffington, 2016), lack of teacher training (Patton et al., 2020), and lack of access to computers and technology. Video games as an element of visual art and visual culture to be studied and critically examined is not guaranteed in schools, although integration is particularly important, given that many mainstream games reinforce stereotypes and reproduce racist and sexist tropes in particular (Feminist Frequency, 2013; Glaubke et al., 2001; Jansz & Martis, 2007; Leonard, 2003, 2006).

Video Game Design: Strands of Social Justice

Dipti Desai (2020) described social justice art education as follows:

> Social justice art education, I contend, is grounded in the desire to create awareness about sociopolitical issues, challenge common sense attitudes, mobilize civic participation, take action to shift unequal power relations in our society, and work to change policies. (p. 13)

With this definition in mind, it becomes increasingly clear how video game design as an approach to social justice art education weaves together the aforementioned strands of social justice related to access, inclusion, and student-centered pedagogy. The video game industry is in dire need of a more diverse workforce to shift unequal power relations in our society. Game developers are 74% White and male, and most are heterosexual and cisgender (Weststar & Legault, 2015). The industry itself and video game culture more specifically feed misogyny and racism (Hawreliak & Lemieux, 2020; Massicotte & Hara, 2017). Diversifying the workforce and creating games about social issues would also be strategies toward challenging common-sense attitudes. Like any media, the stories

that are told, and the perspectives from which they come, powerfully impact the way we think and see things on a societal level.

Video games can engage with social justice through the fact that not all students in schools will necessarily ever have the opportunity to engage in activities related to game design, despite the fact that video games are regularly played by 97% of adolescents between the ages of 12 and 17 (Lenhart et al., 2008), and that there are more recent notable increases in engagement and spending by 2- to 17-year-olds (NPD Group, 2019). If we consider it important to listen to our students and to develop a curriculum that grows from their interests, as an anti-oppressive curriculum would imply (Desai, 2020; Freire, 1970/2008), this is an important medium to cover.

Finally, we can take this medium and provide opportunities for students to use it as a communication tool through which to both create awareness about the sociopolitical issues that matter to them, and potentially to mobilize civic participation. Similar to the premise that to teach something, one has to have an understanding of the topic, I argue that to design a game about something, one also has to have an understanding of the topic. The same, of course, can be said about making social justice art (Quinn et al., 2006). Situating social impact game design within the context of art education both expands a rich and complex history of social justice art-making and provides a good point of departure through which to begin to interrogate the role of mainstream games in our lives, and the potential of games to do a wide variety of social justice–related work, getting beyond simply being entertaining.

Theoretical Framework: Critical and Collective Pedagogy

In his landmark work, *Pedagogy of the Oppressed*, critical pedagogue Paulo Freire (1970/2008) reminded us that in an anti-oppressive learning context, everyone brings something to the table. There is no distinct "teacher" because we are all teacher–students and student–teachers. Knowledge and understanding move between and among all participants, and humanization, which Freire (1970/2008) considered the opposite of oppression, occurs through praxis defined as "reflection and action upon the world in order to transform" (p. 51). More recently, in *Studies in Art Education*, Dipti Desai (2020) called for decolonization in art education through "collective pedagogy" (p. 20). She explained that "collectivity is a form of cultural production that is not about individual self-expression or even political expression, but rather, it is about democratizing social change that requires building networks of solidarity" (p. 18). Desai framed this shift from the language of "I am" to the language of "I want this for us" and called our attention back to Freire, who "reminded us that liberation is a collective project that calls for dialogic participation grounded in a critical consciousness of how both oppressor and oppressed are bound together through power relations" (p. 18).

Further, collaborative video game design creates the opportunity for what Desai (2020) referred to as collective pedagogy. She stated:

> Collective pedagogy is connected to anti-oppressive pedagogy, within which we learn to be together and think together. It is a process fraught with tensions, contradictions, and confrontations that have to be worked through together because the basis of our relationship is fundamentally grounded in diversity and difference as central values that cannot be erased. (p. 20)

Desai's (2020) emphasis on the value and importance of collective pedagogy that is anti-oppressive and within which "we learn to be together and think together" (p. 20) is at the heart of the role that social impact video

game design can play in art education. Large-scale game design, like film, is by necessity a collaborative process, although both media can also take place on an individual level. When the game being collectively designed is a social impact game, made with the intention of having the player engage with a social justice–related issue, the collaborative process becomes, by design, a space where participants learn to be together and think together.

Methodology and Context

Social change video game design is one example of a site where humanization, collective pedagogy, and engagement with social justice issues and movements can come together. To ground this position, I draw from research derived from an AoW project that took place in Philadelphia during the spring of 2020 (AoW3).

The AoW project is a collaborative game-design project providing opportunities in schools for students who do not see themselves represented in games to design video games about the social justice issues that matter to them. It began as a collaboration between Angelique Mannella, the chief executive officer of a former social impact game-design startup company, and me. I have since carried the idea with me from Montréal, Québec, Canada, to Philadelphia, Pennsylvania, in the United States, and I am working toward growing further AoW research opportunities. Social justice issues, the subject of the AoW video games, are the issues that arise as a result of inequities and oppression (Young, 1990). Examples of such issues include homelessness, poverty, racism, sexism, homophobia, and the climate change crisis.

There have been two recent incarnations of this research: *AoW2: Girls With Ideas*, and *AoW3*: *Proudly Untitled*. Both were case studies that took place at Academy for the Middle Years Northwest Middle School (AMY Northwest) during the fall 2019 and spring 2020 semesters, respectively, in the Roxborough neighborhood in Northwest Philadelphia. AMY Northwest is an urban middle school that consists of a student body that is 88% African American or Black, and 100% of the student body is eligible for free lunch (Public School Review, 2017–2018). Participants in this project included me as the project lead and principal investigator. I am an assistant professor in the Art Education and Community Arts Practices department at Tyler School of Art and Architecture, Temple University, in Philadelphia, Pennsylvania. Our independent game developer, Ashley Rezvani (Clockwork Raven Studios), is an activist who has also taught game design to both high school and postsecondary students as an adjunct at Harrisburg University of Science and Technology. I am a White Canadian expatriate. Ashley identifies as mixed race. She is half Iranian and a second-generation immigrant. The artist intern from the Harrisburg University of Science and Technology, Sierra Kirby, is a White undergraduate student who was studying interactive media with a concentration in purposeful game design at the time. She did not work directly with the 8th-grade participants. Ashley, Sierra, and I met weekly via Zoom throughout the semester. These meetings took place after my weekly session with the 8th graders, and was the time to update game details based on new art and ideas gleaned from the youngest participants. Sierra created the art assets for the game, based on drawings by the students. There were four core 8th-grade participants involved in the project, identified here via their pseudonyms: Black Panther, Thor, Iron Man, and Star-Lord, with contributions from Player One, Player Two, and Player Three. The core group of students had been participating in an after-school comic book club with their art teacher, Walter Myrick, since 6th grade. Walter is a Black American art educator, and the core 8th-grade participants are also Black. Leading up to this project and beyond, I have developed a

relationship with Walter and the school in various ways, from supervising our student teachers, to teaching special projects, to building opportunities for the AMY Northwest students to talk to our student teachers about learning from their perspective.

The research question I sought to answer through this work was: How does/can learning about social justice happen through the collaborative game-design process? Although plans did not work out exactly as originally intended, much was learned and there is much to build on. The original intention of AoW2 was to work with a small, local, independent game-design company to develop a game about climate change with the participants (in this case, funding was intended for climate change–related projects). However, the company backed out at the last minute, so AoW2 became an iterative after-school games club where we played, talked about, and created games. AoW3 involved working with the new game developer, Ashley, and the art intern, Sierra, to collaboratively make a video game about climate change called *The Air We Breathe* (AoW, 2020). Because the fall participants chose to discontinue through the spring semester at the last minute, the group of 8th-grade students, who were in the comic book club at the same time, jumped at the opportunity to design a video game about climate change when Walter suggested I ask them. The focus of this article, then, is AoW3, because we developed a complete social impact video game. Because this is a public-facing project with a website through which the game is available, the school and adults are identified. The 8th-grade contributors are acknowledged by their first names within the context of the project. Within the context of the research, pseudonyms are used for these youth participants, as identified above, although they are aware that they are not completely anonymous due to the public nature of the project.

To answer the research question, I recorded and transcribed our after-school sessions. I created pre- and postgame design surveys to track any learning related to knowledge and understanding about social justice and social issues. Because AoW3 began suddenly and unexpectedly, I could not have the group complete the pregame design surveys before we started designing the game. I did not yet have consent, and there was pressure to begin to work out the game details because we had lost 2 weeks due to the participant transition and no heat in the building. For this reason, I had planned exit interviews for AoW3 instead, but they did not come to fruition due to the COVID-19 shutdown. We attempted to reach the participants after the shutdown, to no avail. Within this school district, I am not able to reach out to the participants directly. Walter attempted to connect with the students and/or their parents, also to no avail. Life is complex, and our feeling is that the families had other more pressing matters to contend with during this time.

There were five sessions of AoW3 (January 28; February 4, 11, and 25; and March 3, 2020). Shortly after each session, I wrote reflections based on the following categories: general notes, curriculum, unexpected moments, and things that stood out. The transcripts of the sessions were coded based on the following themes: social justice, video games, excitement/motivation, knowledge weaving, and origins (tracing the details of the final game to the source of the idea). The core group of four males and three occasional contributors, one female and two males, participated during the first three sessions, where the main premise and the broader strokes of the game were decided. Black Panther continued to work with me to establish some of the finer details during the final two sessions. I never pressured anyone in the club to do things. Everything was an invitation that they could take or leave. After the third session, the other participants contributed fleetingly but mostly did homework and socialized.

Building the Game: The Process

During the first session, there were five participants. We discussed the basis for most video games: if-then statements and win-lose conditions. The participants developed an understanding of what if-then statements are by applying them to a simple game, *Pac-man* (Bandai Namco Entertainment, 1980), and then to more complex games that they play, like *Call of Duty* (Activision, 2018). We then began to discuss climate change. The participants and I began to conceptualize the game based on concept/feeling, verbs, narrative, and characters. We began building the narrative, and then I took this information to the game developer. She commented on the plans in a Google Doc shared between the two of us, and she joined the students and me for the second session to help guide the design process. Her main feedback was that the game should be grounded in the reality of climate change rather than the fantastical idea that the group had first conceived, in which the protagonist had the power to summon rain to extinguish fires. This issue, the importance of grounding the game in reality, was the main concept we wanted to discuss with the group during Session 2.

During the second session, there were four students, Ashley (via Skype), and me. I handed out sketchbooks so that participants could begin drawing background scenes and characters. Over the first few weeks, Black Panther designed the protagonist and the bosses that appear at the end of the first two levels. Thor's background designs inspired much of the dystopian background in the final level. During the second session, we warmed up again by playing the simple game *Space Invaders* (Taito, 1978) and shouting out the corresponding if-then statements. During this warm-up, we explored the concept of win-lose conditions. We then segued into connections with a game they were currently playing, *Red Dead Redemption* (Rockstar Games, 2010). Next, Black Panther reviewed the game details the group had planned the week before. During this session, I reminded the group that Thor had mentioned previously that the game should be realistic. Based on my conversation with Ashley, I reiterated his point and explained that if the players "are going to understand that it's our fault as a society that climate change is happening, then the hero maybe has some fantastical power, but should be grounded in reality. Perhaps a firefighter or something real like that. What do you think of that idea?" To this, Black Panther responded, "Right, we have to ground it and not have the player be like a superhero that has the power of water." This is one example of knowledge weaving. In this case, an idea, also connected to a thought brought to the table by a student participant, was brought back with more context related to the game narrative and goals. Black Panther accepted the detail by restating it in his own words and weaving it into the premise of the game. The group agreed, and during this session, the most essential details of the game were established. During the third session, the group excitedly played a game prototype based on what we had established so far and gave feedback. During the fourth and fifth sessions, Black Panther and I spent time working on some of the more nuanced narrative details.

The Air We Breathe is about the protagonist's desire to honor the memory of their father. The father was a firefighter in Philadelphia who died in the line of duty due to the increase in fires from climate change. The air is severely polluted, and the protagonist wears an oxygen mask and gathers oxygen tanks to survive (Figure 1). The protagonist honors their father by gathering and studying knowledge about climate change in their journal (Figure 2) and by throwing pamphlets (facts and tips) at minions who work for the oil and gas industry, the lumber industry, and

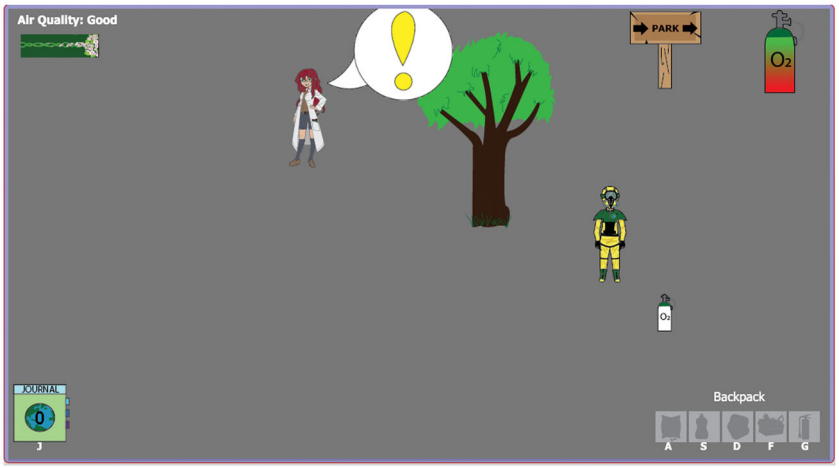

Figure 1. ***The Air We Breathe*****, screenshot tutorial scene by AoW (2020).**

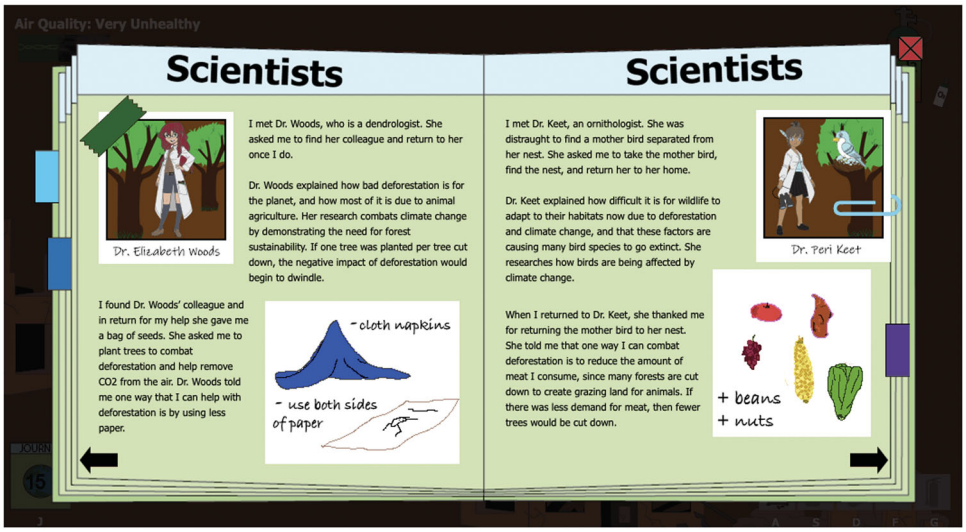

Figure 2. ***The Air We Breathe*****, screenshot journal by AoW (2020).**

Figure 3. *The Air We Breathe*, screenshot level 1: lumber by AoW (2020).

Figure 4. *The Air We Breathe*, screenshot level 1: interaction with scientist by AoW (2020).

the government, converting them into activists (Figure 3). The protagonist also learns from scientists and helps them with various tasks that contribute to cleaner air and general care for the environment (plant trees, clean oil-covered animals, save birds, fix solar panels and wind turbines; Figure 4). At the end of each level there is a "boss battle,"

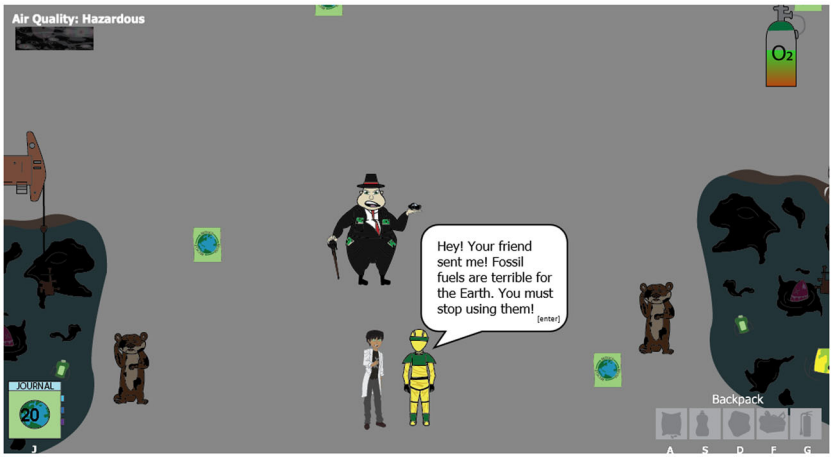

Figure 5. ***The Air We Breathe*****, screenshot level 2: final "boss battle" by AoW (2020).**

where the protagonist shares facts learned about the related industry to win over the bosses (Figure 5).

Analysis: Collaborative Social Impact Game Design as a Site for Resistance and Transformation in Art Education

The game-design process allowed us to be together and think together (Desai, 2020) on several levels. First, participants questioned details and game tropes in their everyday game play on a meta level. Second, unexpected conversations about games and pop culture more broadly emerged, leading to some serious conversations about assumptions and representation. Third, details were negotiated rather than imposed, particularly when it came to violence. Finally, the way knowledge was shared throughout the game-design process, particularly story building, was humanizing in a Freirian sense. The young participants chose or rejected details and ideas they wanted when they were proposed by either weaving them into the story or dropping them. I will expand on each of these points in the paragraphs that follow.

Through the act of game design, participants were confronted with decisions that forced them to notice typical video game tropes and norms related to gender, race, and violence on a meta level. What I mean by *meta level* is that I supported the young game designers in reflective practices about video games where opportunities existed for them to step outside of what is more typically a critically passive relationship with games (Jenkins, 2009; see transparency problem specifically, pp. 14–16). What I mean by tropes, for example, is that games often require female characters to be rescued (Feminist Frequency, 2013), and Black male characters are often portrayed as criminals (Leonard, 2003, 2006). Although game-design tropes and norms can easily be regurgitated in game design with young people, they can also be noticed, recognized, and questioned as a result of the design process itself, and through facilitation and dialogue. For

example, in the case of AoW3, the group decided almost immediately (Session 2) that the protagonist should remain in their protective suit with a helmet so that they could become any gender or race the player imagines or wishes them to be. A more complicated example relates to violence. The males with whom I worked, all self-identified avid gamers, repeatedly shared sentiments valuing the violence in the games they play, often defaulting to a desire to incorporate violence into the game. However, despite their attachment to violence in video games, they also collectively decided that the game should not contain violence because they felt a sense of responsibility to their younger target audience. This is not to say, however, that after this planning session the role of violence never resurfaced. It was an ongoing discussion and negotiation.

A complex example of a negotiation related to violence took place during Session 3. Black Panther articulated his position about violence with clarity and conviction. We were discussing the format of the levels. Black Panther and Star-Lord had fallen into default violence mode while planning the game. What I mean is that their use of language to describe the game habitually defaulted to "shooting," "killing," and "enemies" despite the fact that the game involved *throwing* pamphlets at minions. The protagonist was referred to as the hero and the minions were referred to as the enemy to be killed. Star-Lord was about to contribute two ideas, but when I reminded them that we were "trying not to be violent," he explained to his friend beside him that that comment "took out" his two ideas immediately. He was not happy with this reminder, but Black Panther and I continued to talk. This was our exchange:

> BP: Even though you want to stay light on the violence maybe you could like give a little taste of a little violence—maybe not too much—you know what I mean?
>
> R: (laughing) It's really hard to break free of the violence.
>
> BP: Cause it's like I'm not saying that's what kids like, what we like … but I'm just saying that's the majority of the games that we play.
>
> R: It is true, it is the majority of the games but maybe this is why your game would stand out if it didn't do this—fall for that easy way out.
>
> BP: The only problem is when you try to be different they kind of push you away and like not give you the credit you deserve.
>
> R: Unless you do it really well.
>
> BP: Because you don't wanna be like everyone else but then you don't want to be too different cause you don't want to alienate too many people.
>
> R: That's a good point.
>
> BP: So maybe it could be educational, and like adventures maybe you gotta give people what they want just a little bit.
>
> R: (laughing) Maybe.
>
> BP: Maybe you gotta sacrifice, like take them out but maybe it doesn't have to be graphic y'all end up like right near a pit—you push 'em in a pit and you don't see any violence or you could like … or he just escapes.
>
> R: Remember, the main weapon is the knowledge 'cause you turn the minions into protestors.

At this point I thought of the powerful nonviolent example of Malcolm X (Haley, 1964, p. 234) protecting an injured Black Muslim who was taken into police custody through solidarity and numbers. I shared the story with Black Panther. When Malcolm X

heard that Brother Hinton had been taken into custody, he rounded up hundreds of Muslims who stood quietly together outside of the police precinct, waiting and witnessing until an ambulance was called to take Brother Hinton to the hospital. The group followed the ambulance and remained at the hospital until Malcolm X was able to speak directly to a doctor who assured him that Hinton would be cared for; only then did Malcolm X give the order for the group to disperse. Black Panther did not react directly to this story, but he changed his approach to the narrative. He now described the beginning of the game as being overrun with the minions. The minions represent the government and the industries. You start the game mostly "fighting"/converting minions into protestors, and by the time you get to the president, everyone is on your side. I rode this wave with him and said, "They collectively take over as a group," and he said, "… and become a new society!" His preoccupation with violence changed to winning by collective action.

During Session 4, Black Panther and I had a conversation about representation. As decisions regarding our three different game levels—lumber, oil, and government—took place, we discussed potentially having different-looking minions for each level. He said that in the oil level, minions would wear suits, and I suggested perhaps the lumber-level minions would wear lumberjack jackets. I reminded him that there should be mixed-gender representation, and this led to a conversation about his hesitation to have the protagonist (of unknown gender) physically fighting with females (at this point he was defaulting again to physical battles). I drew his attention to the fact that men fighting men was also problematic in games, so normalized that it is not even questioned. Further intense conversation grew as he shared his perspective about same-sex relationships not belonging in cartoons. This opened the opportunity to discuss the importance of representation and the idea that there are many ways of being in the world, and many cultures, skin colors, and gender identities, all of which should be represented in all media, and yet we are confronted most often with stories about straight, White, nuclear families.

Finally, the most significant learning about climate change happened through the rich dialogue that took place during collaborative story building. Through both the establishment of the rule system and the narrative of the game, there are many further examples of knowledge building related to the issue of climate change directly, within a humanizing framework as articulated by Freire (1970/2008). In the case of AoW3, as the narrative of the story was excitedly being discussed by all, more typically myself or Ashley, although sometimes also the younger participants themselves, would bring the attention back to climate change by suggesting real-world details that could be woven into the narrative. For example, during Session 1, Player Two explained in detail the way carbon dioxide molecules become trapped in the atmosphere and heat up the planet. I mentioned the increase in the number of 90-degree days in Philadelphia every summer, and Player Two reminded us of the increase in wildfires and floods. Iron Man added that the polar ice caps were melting. At the time, the fires in Australia and California had been in the news, so I mentioned them. Thor asked how the fires in Australia started. I explained that it was so hot and dry that brush could easily catch fire, which quickly spread. Pollution and fire became the main premise of the game. During Session 2, Player One built on this information further, establishing one of the main win conditions: that we start off with poor air quality and do things that help to clear the air as we go (plant trees, fix solar panels and windmills, clean water, etc.).

This knowledge weaving happened multiple times throughout the game-design

process. This is clear as we combined our climate change knowledge in the above example, but the richness and complexity of this process was most obvious when many of us were knowledge weaving within the game narrative. During Session 2, six of us—four students, Ashley, and I—were knee-deep in the narrative. One person would mention an idea—for example, Black Panther and Thor were talking about how we would make three distinct levels. They were describing society as being guilty of "different versions of global warming." They did not yet have the language to describe these "versions." Ashley helped them to translate this into practical scenarios: a factory dumps waste into the ocean, or gas is used instead of solar power. Thor then added his own example where the bad guys break solar panels (part of the final game!). I then assigned a name to the "bad guys": the oil and gas industry. During this session, where most of the hour was dedicated to building the game narrative and mechanics, there were eight examples of this form of knowledge weaving. The number 8 is derived from eight "macro" topics within which more nuanced microknowledge exchanges took place. For example, in the description above, Black Panther and Thor hatched the macro topic "climate change culprits" as they tried to articulate causes of global warming. Ashley grounded their idea in two practical examples. Thor, learning from Ashley, then added his own example, which I further supported by helping him to give a name to the saboteur of the solar panels, adding a further real-world detail to the story.

During Session 5, Black Panther and I had to figure out the lead-up to the first boss encounter. Black Panther wove the enemies' desire for oil into the story narrative, explaining that the boss is hoarding the oil in the city, and when they receive calls for oil, they ship it out. I then asked, "To rich people right?" as an attempt to remind him that in real life they are not just shipping it around for no reason when there is money to be made. He picked up the rich people idea and continued:

> To rich people, where they can get most of the bang (for their buck), ship it off to wherever, it doesn't matter and they got money shipped back to them. The more money they make sometimes the more (oil) they give out, but the problem is the more they give out while they're doing it it's actually spilling and stuff like that.

I then suggest a further detail that would imply that oil companies often care more about money than they do about the health and safety of people and animals. I said, "Yeah, and they're being careless because [they're like] we don't care if we damage stuff we just want to get the money we're not maintaining our trucks." Black Panther responded: "Yeah, they're just getting the money," weaving this notion into the storyline and continuing with his vision. Participants continued to develop narrative ideas integrating new pieces of real-world information related to the issue. In doing so, the real-world information was woven together with the more imaginative storyline, making the knowledge inseparable from the story. In other words, if you describe and explain the story, you also describe and explain the real-world details. Knowledge weaving and the subsequent retelling of the story seem a great way to learn.

Discussion: The Power of Stories

The collaborative act of knowledge weaving and narrative building were key to learning about climate change within a critical pedagogy framework. Storytelling not only helps to make meaning of experience and convey values, but good stories are also easily remembered (Moutafidou & Bratitsis, 2018). Ingram-Goble (2013) argued that video game

design provides a structure for remembering what has been learned and plays a vital role in the transfer of information. Research related to game design and math indicates that learning happens best when students design games where the math is integrated directly into the story (feed the monster a quarter of the pie to distract her so you can run by), rather than interrupting the story to solve a math problem before continuing (Ke, 2014).

One could ask, Why design video games instead of just stories? What is distinct about video games, in addition to their popularity and the fact that both designers and players actively engage and interact with them, is what Ian Bogost (2007) has described as procedural rhetoric. Video games make arguments or reveal perspectives through the process of actively playing them. Important for students to understand is that games, like any media, can present a persuasive argument or perspective, but it is only just this—an argument or perspective that should be questioned and engaged with. Many art and media educators have argued that media making and design is the best way for students to share their perspective while developing their critical-thinking skills through the understanding of how design works (Albers & Sanders, 2010; Davis, 1998; Jenkins, 2009; Peppler & Kafai, 2007; Tran, 2016). More importantly, however, are the strands of social justice outlined earlier in this article. Video game design has an important role to play in education related to access, inclusion, and student-centered pedagogy.

Conclusions and Future Directions

AoW research emphasizes the power of collaborative social impact game design as a learning tool through which the participants, adults included, learned to be together and think together (Desai, 2020). Within the collaboration, collective knowledge weaving about climate change, along with conversations about stereotypes, representation, and violence, took place throughout the project. The potential here, within the dynamic of collaborative learning about social issues and social justice through the game-design process, is strong. In the future, I will look more closely at the retention of real-world information and understanding through the story-building and storytelling process. I will continue to investigate the dynamics of knowledge weaving and inquire more deeply into the impact of collaborative learning about the issue from the student perspective, because, as mentioned earlier, the pre- and postgame design surveys and exit interviews did not take place. As the project grows and more social issues are explored through game design, it will also be important for me (ongoing) as well as research assistants to have a deep understanding of critical and collective pedagogy in terms of both theory and practice (praxis), along with a keen interest in developing our ongoing understanding of the social issues the younger participants are interested in addressing. With further research to develop best practices, collaborative social impact video game design has great potential as a site for resistance and transformation in social justice art education.

ACKNOWLEDGMENTS

I am indebted to the group of middle school students at AMY Northwest, especially Black Panther for his constant enthusiasm and wealth of imagination; Walter Myrick, the art teacher at AMY Northwest, for welcoming me into his classroom and helping me to problem solve; and Jodan Floyd, the principal, for her unrelenting support and easygoing, student-centered nature.

Sierra Kirby, our art intern from the Harrisburg University of Science and Technology, did a wonderful job of creating the art for *The Air We Breathe* (2020), and of bringing any drawings contributed by the 8th graders to life. Thank you to everyone at the Loretta C. Duckworth Scholars Studio for the rich intellectual support and beyond. I am grateful to Kelly Boudreau from the Harrisburg University of Science and Technology for connecting me with both Sierra and Ashley Rezvani. Most of all, I am indebted to Ashley for being PERFECT for this project, having teaching skills and a passion for social justice—and she built the game! I learned so much from her and will forever be thankful.

DISCLOSURE STATEMENT

No conflicts of interest to report.

FUNDING

This work was supported by a Presidential Humanities and Arts Research Program Award from the Office of the Vice President for Research at Temple University; a Loretta C. Duckworth Scholars Studio Faculty Fellowship Award, Temple University; and Tyler School of Art and Architecture.

ORCID

Renee Jackson http://orcid.org/0000-0003-2062-346X

REFERENCES

Activision. (2018). *Call of duty 4* (Playstation) [Video game].

Albers, P., & Sanders, J. (Eds.). (2010). *Literacies, the arts, and multimodality*. National Council of Teachers of English.

Alexander, A., & Ho, T. (2015). Gaming worlds: Secondary students creating an interactive video game. *Art Education*, *68*(1), 28–36. https://doi.org/10.1080/00043125.2015.11519303

AoW. (2020). *The air we breathe* (Online version) [Video game]. Arcade Our Way; Clockwork Raven Studio.

Arora, P., & Itu, S. (2012). Arm chair activism: Serious games usage by INGOs for educational change. *International Journal of Game-Based Learning*, *2*(4), 1–17. https://www.researchgate.net/publication/235663747_Arm_chair_activism_Serious_games_usage_by_INGOs_for_educational_change

Bandai Namco Entertainment. (1980). *Pac-man* (Google Doodle version) [Video game].

Baranowski, T., Buday, R., Thompson, D. I., & Baranowski, J. (2008). Playing for real: Video games and stories for health-related behavior change. *American Journal of Preventive Medicine*, *34*(1), 74–82. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2189579

Bates, M., Brown, D., Cranton, W., & Lewis, J. (2009a). A design for learning: Exploring serious-games design with children. In *ITAG 2009 Conference Proceedings* (pp. 3–10). Interactive Systems Research Group. https://isrg.org.uk/wp-content/uploads/2013/02/ITAG-2009-Conference-Proceedings.pdf

Bates, M., Brown, D. J., Cranton, W. M., & Lewis, J. (2009b). Gaming and the firewall: Exploring learning through play via game design with children. *Proceedings of the 3rd European Conference on Games-Based Learning*. ResearchGate. https://www.researchgate.net/publication/254200302_Gaming_and_the_firewall_Exploring_learning_through_play_via_game_design_with_children

Bogost, I. (2007). *Persuasive games: The expressive power of videogames*. MIT Press.

Ciampaglia, S., & Richardson, K. (2015, December 22). The plug-in studio street arcade: Collaborations in art and technology. *Scratch Team Blog*. https://medium.com/scratchteam-blog/the-plug-in-studio-street-arcade-92e5d0206463
Ciampaglia, S., & Richardson, K. (2017). The Street Arcade: Creating social justice videogames as a platform for community dialogue. *Art Education*, *70*(4), 17–20. https://doi.org/10.1080/00043125.2017.1317549
Cunningham, C. M., & Crandall, H. M. (2019). Learning the language of justice through play. *Journal of Hate Studies*, *15*(1), 183–202. https://doi.org/10.33972/jhs.167
Davis, M. (1998). Making a case for design-based learning. *Arts Education Policy Review*, *100*(2), 7–15. https://doi.org/10.1080/10632919809599450
de Paula, B. H., Burn, A., Noss, R., & Valente, J. A. (2018). Playing Beowulf: Bridging computational thinking, arts and literature through game-making. *International Journal of Child-Computer Interaction*, *16*, 39–46. https://doi.org/10.1016/j.ijcci.2017.11.003
Desai, D. (2020). Educating for social change. *Studies in Art Education*, *61*(1), 10–23. https://doi.org/10.1080/00393541.2019.1699366
Feminist Frequency. (2013, March 7). *Damsel in distress: Part 1—Tropes vs women in video games* [Video]. YouTube. https://www.youtube.com/watch?v=X6p5AZp7r_Q
Freire, P. (2008). *Pedagogy of the oppressed: 30th anniversary edition* (M. B. Ramos, Trans.). Continuum. (Original work published 1970)
Gill, D. V. (2009). Usefulness of video game experience for students learning and creating digital 3-D. *Visual Arts Research*, *35*(2), 109–121.
Glaubke, C. R., Miller, P., Parker, M. A., & Espejo, E. (2001). *Fair play? Violence, gender and race in video games*. Children Now. https://files.eric.ed.gov/fulltext/ED463092.pdf
Haley, A. (1964). *The autobiography of Malcolm X*. Ballantine Books.
Hawreliak, J., & Lemieux, A. (2020). The semiotics of social justice: A multimodal approach to examining social justice issues in videogames. *Discourse: Studies in the Cultural Politics of Education*, *41*(5), 723–739. https://doi.org/10.1080/01596306.2020.1769936
Ingram-Goble, A. (2013). *Playable stories: Making programming and 3D role-playing game design personally and socially relevant* (Publication No. 3601806) [Doctoral dissertation, Indiana University]. ProQuest Dissertations.
Jackson, R. (in press). Engaging civic participation through a Deweyan lens using social justice video games. In M. Bae-Dimitriadis & O. Ivashkevich (Eds.), *Engaging youth civic participation: Critical approaches to teaching digital media in art classrooms and communities*. National Art Education Association.
Jackson, R. E., & Sheepy, E. (2019). Learning from social impact games to support integration into middle school classrooms. In Y. Zhang & D. Cristol (Eds.), *Handbook for mobile teaching and learning* (2nd ed., pp. 199–219). Springer. https://doi.org/10.1007/978-981-13-2766-7
Jansz, J., & Martis, R. G. (2007). The Lara phenomenon: Powerful female characters in video games. *Sex Roles*, *56*, 141–148.
Jenkins, H. (with Purushotma, R., Weigel, M., Clinton, K., & Robison, A. J.). (2009). *Confronting the challenges of participatory culture: Media education for the 21st Century*. MIT Press.
Kafai, Y. B. (1995). *Minds in play: Computer game design as a context for learning*. Lawrence Erlbaum. https://www.researchgate.net/publication/246829736_Minds_in_Play_Computer_Game_Design_As_A_Context_for_Children's_Learning
Kafai, Y. B. (2003). Children designing software for children: What can we learn? In S. MacFarlane, T. Nicol, & J. Read (Eds.), *IDC'03: Proceedings of the 2003 Conference on Interaction Design and Children* (pp. 11–12). Association for Computing Machinery. https://doi.org/10.1145/953536.953539
Kafai, Y. B. (2006). Playing and making games for learning: Instructionist and constructionist perspectives for game studies. *Games and Culture*, *1*(1), 36–40. https://doi.org/10.1177/1555412005281767
Kafai, Y. B., & Burke, Q. (2015). Constructionist gaming: Understanding the benefits of making games for learning. *Educational Psychologist*, *50*(4), 313–334. https://doi.org/10.1080/00461520.2015.1124022
Ke, F. (2014). An implementation of design-based learning through creating educational computer games: A case study on mathematics learning during design and computing. *Computers & Education*, *73*, 26–39. https://doi.org/10.1016/j.compedu.2013.12.010

Keifer-Boyd, K. (2005). Children teaching children with their computer game creations. *Visual Arts Research*, *31*(1), 117–128.
Lenhart, A., Kahne, J., Middaugh, E., Rankin Macgill, A., Evans, C., & Vitak, J. (2008). *Teens, video games and civics: Teens' gaming experiences are diverse and include significant social interaction and civic engagement*. Pew Internet and American Life Project. https://www.pewresearch.org/internet/2008/09/16/teens-video-games-and-civics
Leonard, D. (2003). "Live in your world, play in ours": Race, video games, and consuming the other. *Studies in Media & Information Literacy Education*, *3*(4), 1–9. https://soc334technologyandsociety.files.wordpress.com/2012/08/leaonard2003.pdf
Leonard, D. J. (2006). Not a hater, just keepin' it real: The importance of race- and gender-based game studies. *Games and Culture*, *1*(1), 83–88. https://doi.org/10.1177/1555412005281910
Massicotte, M. (Producer), & Hara, G. (Director). (2017). *Geek girls: The hidden half of nerd culture* [Film]. Women Make Movies.
Meriläinen, M., Aurava, R., Kultima, A., & Stenros, J. (2020). Game jams for learning and teaching: A review. *International Journal of Game-Based Learning*, *10*(2), 54–71. https://doi.org/10.4018/IJGBL.2020040104
Moutafidou, A., & Bratitsis, T. (2018, June). Digital storytelling: Giving voice to socially excluded people in various contexts. In *DSAI 2018: Proceedings of the 8th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-Exclusion* (pp. 219–226). Association for Computing Machinery. https://doi.org/10.1145/3218585.3218684
NPD Group. (2019, October 8). *According to the NPD group, 73 percent of U.S. consumers play video games*. https://www.npd.com/news/press-releases/2019/according-to-the-npd-group-73-percent-of-u-s-consumers-play-video-games
Parks, N. S. (2008). Video games as reconstructionist sites of learning in art education. *Studies in Art Education*, *49*(3), 235–250. https://doi.org/10.1080/00393541.2008.11518738
Patton, R. M. (2013). Games as an artistic medium: Investigating complexity thinking in game-based art pedagogy. *Studies in Art Education*, *55*(1), 35–50. https://doi.org/10.1080/00393541.2013.11518915
Patton, R. M., & Buffington, M. L. (2016). Keeping up with our students: The evolution of technology and standards in art education. *Arts Education Policy Review*, *117*(3), 1–9. https://doi.org/10.1080/10632913.2014.944961
Patton, R., Sweeny, R. W., Shin, R., & Lu, L. (2020). Teaching digital game design with preservice art educators. *Studies in Art Education*, *61*(2), 155–170. https://doi.org/10.1080/00393541.2020.1738165
Peppler, K. A. (2010). Media arts: Arts education for a digital age. *Teachers College Record*, *112*(8), 2118–2153. https://doi.org/10.1177/016146811011200806
Peppler, K. A., & Kafai, Y. B. (2007). What videogame making can teach us about literacy and learning: Alternative pathways into participatory culture. *Situated Play, Proceedings of DiGRA 2007 Conference*. http://www.digra.org/wp-content/uploads/digital-library/07311.33576.pdf
Public School Review. (2017–2018). *AMY NW*. https://www.publicschoolreview.com/amy-nw-profile
Quinn, T. M., Ploof, J., & Hochtritt, L. J. (2006). *Art and social justice education: Culture as commons*. Routledge.
Rockstar Games. (2010). *Red dead redemption* (Playstation 3) [Video game].
Ruggiero, D., Garcia de Hurtado, B., & Watson, W. R. (2013). Juvenile offenders: Developing motivation, engagement and meaning-making through video game creation. *International Journal of Game-Based Learning*, *3*(2), 112–129. https://doi.org/10.4018/ijgbl.2013040107
Salen, K. (2007). Gaming literacies: A game design study in action. *Journal of Educational Multimedia and Hypermedia*, *16*(3), 301–322. https://www.learntechlib.org/primary/p/24374
Sweeny, R. W. (2010). Pixellated play: Practical and theoretical issues regarding videogames in art education. *Studies in Art Education*, *51*(3), 262–274. https://doi.org/10.1080/00393541.2010.11518807
Taito. (1978). *Space invaders* (Online version) [Video game].
Thumlert, K., de Castell, S., & Jenson, J. (2018, October). Learning through game design: A production pedagogy. *Proceedings of the European Conference for Games Based Learning*. https://search.proquest.com/openview/e6c7cb89ca2666f08267bcbb5520bbca/1?pq-origsite=gscholar&cbl=396495
Tran, K. M. (2016). "Her story was complex": A Twine workshop for ten- to twelve-year-old girls. *E-Learning and Digital Media*, *13*(5–6), 212–226. https://doi.org/10.1177/2042753016689635

U.S. Department of Education. (2020). *Science, technology, engineering, and math, including computer science*. https://www.ed.gov/stem

Weststar, J., & Legault, M.-J. (2015). *Developer satisfaction survey 2015: Summary report*. International Game Developers Association. https://s3-us-east-2.amazonaws.com/igda-website/wp-content/uploads/2019/04/21174418/IGDA_DSS_2015-Summary_Report.pdf

Whitson, J. R., & Dormann, C. (2011). Social gaming for change: Facebook unleashed. *First Monday*, *16*(10). https://firstmonday.org/ojs/index.php/fm/article/view/3578

Wu, B., & Wang, A. I. (2012). A guideline for game development-based learning: A literature review. *International Journal of Computer Games Technology*, *2012*, Article 103710. https://doi.org/10.1155/2012/103710

Young, I. M. (1990). *Justice and the politics of difference*. Princeton University Press.