Speculative frictions: writing civic futures after AI

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Abstract

Purpose – The purpose of this study is to examine how young people imagine civic futures through speculative fiction writing about artificial intelligence (AI) technologies. The authors argue that young people's speculative fiction writing about AI not only helps make visible the ways they imagine the impacts of emerging technologies and the modes of collective action available for leveraging, resisting or countering them but also the frictions and fissures between the two.

Design/methodology/approach – This practitioner research study used data from student artifacts (speculative fiction stories, prewriting and relevant unit work) as well as classroom fieldnotes. The authors used inductive coding to identify emergent patterns in the ways young people wrote about AI and civics, as well as deductive coding using digital civic ecologies framework.

Findings – The findings of this study spotlight both the breadth of intractable civic concerns that young people associate with AI, as well as the limitations of the civic frameworks for imagining political interventions to these challenges. Importantly, they also indicate that the process of speculative writing itself can help reconcile this disjuncture by opening space to dwell in, rather than resolve, the tensions between "the speculative" and the "civic."

Practical implications – Teachers might use speculative fiction writing and the digital civic ecologies framework to support students in critically examining possible AI futures and effective civic actions within them.

Originality/value – Speculative fiction writing offers an avenue for students to analyze the growing civic concerns posed by emerging platform technologies like AI.

Keywords Digital literacies, Digital citizenship, Writing, Artificial intelligence, Civics, Speculative fiction

Paper type Research paper

> Utopia is the process of making a better world, the name for one path history can take, a dynamic, tumultuous, agonizing process, with no end. Struggle forever.
>
> —Kim Stanley Robinson, *Pacific Edge*

We begin with this epigraph from science fiction writer Robinson's (1990) novel *Pacific Edge* because it crystallizes a relation between two subjects whose interplay this article examines: speculative fiction and civic transformation. The quote originally appears as a diary entry from Tom Barnard, a disenchanted public defender and eco-socialist organizer who is attempting to write a speculative fiction novel. While doing so, he wrestles with the ambivalence he feels about the political impact the book might have. On one hand, Tom believes writing a utopian story could be "a stab at succeeding where my real work has failed." Speculative fiction, from this perspective, holds civic potential by jettisoning the world as-it-is so that the world as-it-might-be can come into view. On the other hand, Tom

also worries that such stories may impede social action – that civic dreaming, unmoored from the material conditions of real people and real distributions of power, dulls our collective acumen, and political will, to change the world we have inherited. Vacillating between these positions, he ultimately comes to the dialectical stance reflected in our epigraph: where utopia is both an end and a means, a perpetual struggle between active imagination and imaginative action whose collisions bring better worlds into being.

This article is an exploration of the same dialectic Tom identifies, between "the speculative" as a narrative form and "the civic" as a site of political transformation. More precisely, it is an investigation of how young people engage this tension, as it pertains to artificial intelligence (AI). We use "AI" here inclusively, as a shorthand both for hypothetical technologies that approximate human cognitive states (e.g. sentient machines or "strong/general AI;" Searle, 1980) and actually existing technologies that solve bounded problems using computational inferences (e.g. self-driving cars or "weak AI;" Bechmann and Bowker, 2019). As a subject that has long fascinated speculative fiction writers (Vint, 2023) and that has recently risen in prominence as a pressing civic concern (Buolamwini, 2023; Crawford, 2021; Gebru, 2020), AI offers a textured entry point for literacy research to examine not only how young people imagine the long-term impacts of emerging technologies (i.e. the speculative) and the modes of collective action available for leveraging, resisting or countering them (i.e. the civic) but also the frictions and fissures between the two. As we will show, these asymmetries have much to contribute to the growing literature on the role of "the speculative" in literacy studies (Coleman, 2021; Lizárraga, 2023; Mirra and Garcia, 2020; Toliver, 2020) and to justice-oriented civic education, more broadly.

In what follows, we share findings from a practitioner research study (Cochran-Smith and Lytle, 2009) where we considered, what happens when young people use speculative fiction writing to engage in civic inquiry about emerging technologies like AI? Conducted in the classroom of the first author (then a secondary humanities teacher; now a doctoral researcher), in collaboration with the second and third authors (a literacy and social studies researcher, respectively), our study merges perspectives from theory and practice, and across disciplinary boundaries, to consider this question and the wider implications of its answers. Our findings spotlight both the breadth of intractable civic concerns that young people associate with AI, as well as the limitations of the civic frameworks available for imagining political interventions to these challenges. Importantly, they also indicate that the process of speculative writing itself can help reconcile this disjuncture by opening space to dwell in, rather than resolve, these frictions – much like Tom in *Pacific Edge*. We conclude by discussing the potential of this dialectical view of the speculative and the civic for research and teaching and for social transformations beyond the classroom.

Civics in the platform society

Our study began as a shared inquiry into how civic education might better engage the multi-scalar impacts of digital platforms on society. While the term "platform" is commonly associated with tech giants like Google or Facebook, it can refer to any digital app, service or infrastructure that facilitates social, technical and economic exchanges (Gillespie, 2010) – from the mundane (e. g. classroom management software) to the pioneering (e.g. generative AI). Over the past decade, scholars in the interdisciplinary field of "platform studies" (Nichols and Garcia, 2022; Burgess, 2021; McMillan Cottom, 2020; Steinberg, 2019) have documented the spread of platforms in work, leisure, health, education and public governance. They have also demonstrated how this proliferation has remade these social settings to accord with the logics of platform technologies – giving rise to what some call "the Platform Society" (Van Dijck *et al.*, 2018). This scholarship complicates familiar depictions of civic learning related to digital media. In a platform society, concepts like "digital citizenship" (Mossberger *et al.*, 2008), for instance, begin to look less like a set of individual skills for navigating digital environments than a description of a collective

political condition: we, and our students, are always already digital citizens – inhabitants of a world indissolubly enmeshed with digital technologies. Interrogating the civic implications of this condition with students, then, was the foundation of our project.

To do this, we brought the literature of platform studies into conversation with that of civic education. Scholars of platform studies argue that platform technologies are best understood not as singular, standalone "tools", but as complex "ecologies" (Garcia and Nichols, 2021; Nichols and LeBlanc, 2021; van Dijck, 2021). Van Dijck (2013) delineates three interrelated dimensions that animate platform ecosystems: the social, the technical and the political-economic. The *social dimension* refers to the uses and outcomes of platform processes (e.g., what and how people produce and consume using platforms and the differential impacts across settings). The *technical dimension* refers to the architectures that shape how platforms function and interoperate with one another (e.g., code, data, algorithms, interfaces and hardware). And the *political-economic* dimension refers to the commercial and regulatory interests that condition platforms' design, implementation and spread (e.g., business models, legal governance, factory labor and natural resource extraction). Adopting an "ecological" orientation to platforms allowed us to think about emerging technologies, like AI, as multivalent phenomena – inclusive of, yet irreducible to, each of these dimensions.

Our approach to civic education was, likewise, "ecological" in character. Analogous to platform studies, research in civic education has called into question the field's long-standing focus on equipping students with civic "tools" – for example, knowledge of government systems, personally responsible forms of citizenship, dominant norms for civic participation – rather than investigating the environments through which civic life is conditioned and contested (Magill *et al.*, 2022; Ladson-Billings, 2004; Vickery, 2017; Westheimer and Kahne, 2004). Drawing from this work, we distilled three dimensions of this "ecological" orientation to examine alongside that of platforms: civic identity, civic values and civic action (cf. Abowitz and Harnish, 2006; Castro and Knowles, 2017). *Civic identity* refers to the identity conferred onto individuals as members of a polity. *Civic values* refers to dispositions toward others, and the commitments toward the common good that one takes within a given civic unit. *Civic action* refers to the ways that citizens identify, confront or resolve collective civic problems. Taken together, these dimensions allowed us to approach civics, like platforms, as a set of dynamic relations rather than a static object.

Bringing these civic and platform relations into conversation provided us with the *digital civic ecologies* framework that guided our study. We first created a matrix of these relations, which we used to locate intersections where relevant research in platform studies might open paths for civic inquiry. For instance, Benjamin's (2019) theorization of "discriminatory design" offered an entry point for investigating how "technical" systems inherit "values" from the people and societies that shape them – and the implications for social justice. We then devised questions at each intersection, which became the basis for the speculative fiction unit we describe in what follows (Table 1). Importantly, the questions represented here were not the only ones we might have chosen: our planning elicited multiple avenues for exploration at each junction in our framework. Consequently, the unit we share should be understood as a demonstrative, not definitive, case of digital civic ecological inquiry. We highlight several other potential uses of this framework in our discussion below.

Civics and the speculative form
Our study was also shaped by scholarship on "the speculative" as a narrative form. While speculative fiction is a contested term, even among those who write and research it, the phrase refers broadly to works of non-mimetic cultural production (Oziewicz, 2017) – that is, aesthetic objects that deliberately depart from mimesis or the desire to replicate reality with

	Social	Technical	Political-economic
Identity	How do digital platforms confer an identity onto us? (How) does that identity create friction in our lives/ with our other identities?	To what extent do digital platforms "know" us? Are digital platforms neutral? Can/should they be?	Who owns our data? What is the value of it?
Values	How do digital platforms shape the ways we interact with and think about other people?	To what extent do digital platforms alter or reproduce existing social relations? How/why is that embedded in the technical design?	What are the trade-offs to digital platform production? Who are the winners and losers of digital platform production?
Action	Are there differences between on/offline civic action?	How is civic action helped or inhibited by digital platforms' technical infrastructures?	What would be the ideal system of ownership of digital platforms? How could that ideal system come to fruition?

Table 1.
Unit questions generated using the "digital civic ecologies" framework

Source: Authors' own creation/work

exactness (Auerbach, 2013). In many ways, speculative fiction is more inclusive than its adjacent, non-mimetic genres. Where the boundaries between science fiction and fantasy, for instance, are hotly disputed, speculative fiction side-steps these skirmishes, providing an umbrella-concept for thinking about, and across, difference – be it mediational (e.g. books, TV and movies), generic (e.g. steampunk, slipstream and horror) or cultural (e.g. Afrofuturism, magical realism and mythology) (Nicholls and Langford, 2017; Thomas, 2019). Because, as a form, "the speculative" interrogates normative notions of consensus reality – or in Octavia Butler (1995) phrasing, "gets people off the narrow, narrow footpath of what 'everyone' is saying, doing, and thinking" (p. 95) – it is often recognized as having political potential, for stimulating the imagination about what other worlds, and ways of inhabiting them, might be possible. For this reason, a growing education literature has found the speculative to be a generative resource for conceptualizing resistance and agency in literacy and civic learning (Mirra and Garcia, 2020, 2022; Wargo, 2021).

Despite this promise, however, some scholars caution that the speculative form is equally capable of reinforcing, rather than challenging, the assumptions and norms of the society that produced it. The line between speculation and extrapolation is vanishingly thin (Landon, 2014). This tension inheres even in the word itself: "speculation" can signal a radical break from the present, but it is also the name for probabilistic practices that leverage the past to render the future more predictable and controllable (e.g. financial speculation and speculative governance; Keeling, 2019; Komporozos-Athanasiou, 2022). AI is an apt illustration of this contradiction. Much of the press about AI traffics in the first sense of "the speculative," projecting a rosy (or worrying) vision of the future that we ought to embrace (or resist). And yet, to the extent that these projections echo linear narratives of techno-cultural progress (or corrosion), they might be better understood as restatements of white settler logics, rather than imaginative ruptures (Philip *et al.*, 2012). Moreover, even a cursory investigation of AI platforms' actual operation reveals that the technology itself hinges on the second sense of "the speculative," where past data is iteratively reconfigured to produce circumscribed responses to user inputs (Dixon-Román, 2016). The example of AI, then, demonstrates not only how speculative practices can perpetuate present social relations, even as they purport to transform them, but also that such contradictions are not aberrations – they are foundational to, not appropriations of, the speculative form.

Rather than diminishing the civic potential of speculative narratives, our study approaches these frictions dialectically, as sites for exploring the agonistic process by which competing imaginaries of the future (i.e. the speculative) and the available modes of collective action (i.e. the civic) converge [1]. We draw inspiration in such explorations from Jameson (2004), who suggests that speculative fiction often contains an impulse toward *utopia* or *anti-utopia* – terms he associates not with happy and sad endings, but with degrees of historical mutability: utopian narratives open possibilities for radical civic transformation; anti-utopian narratives foreclose them. Returning to our AI example, for instance, we can see how even optimistic accounts of technological progress are actually anti-utopian in character, as the future they envision is little more than a linear succession of innovations to which society must adapt. A superhero story, likewise, may have a cheery resolution, but if it depicts a society whose thriving depends on a savior with no analogue in reality, then this narrative, too, is anti-utopian. By contrast, the source of our epigraph, *Pacific Edge*, is set in a future California, where a community struggles together, against internal and external influences, to sustain a transition to green living in the face of climate change – an imagined course of collective action emblematic of utopia. What Jameson's framing helps make visible, then, are the variegated political projects to which the speculative form can be attached. In the context of our study, it offers a heuristic for exploring these attachments in young people's speculative fiction writing about AI – not, it is worth saying explicitly, for the purpose of assessing whether or not their narratives are sufficiently "utopian," but for glimpsing what kinds of transformative actions they envision as being available for confronting the civic challenges that arise from emerging technologies.

Methods
We locate our study in the tradition of practitioner inquiry (Cochran-Smith and Lytle, 2009), a methodological stance that begins from an understanding of classrooms and close collaboration with teachers, as dynamic sites of knowledge production (Simon *et al.*, 2012). Part of longer genealogies in feminist theory and teacher-research, practitioner inquiry works to unsettle hierarchical assumptions about "theory" and "practice" by attending to their mutual constitution in unfolding activities (Cochran-Smith and Lytle, 1999). Moreover, as Campano *et al.* (2013) note, this orientation is interested in not only documenting situated practices but also "shifting discourse about learners, problematizing the structures of schooling, and creating new conditions for teaching" (p. 104). Indeed, it was these larger aims that brought the three authors together to collaborate on this study. Allie (first author) was an experienced social studies and English language arts (ELA) educator, who was, at the time, teaching eighth grade US history in an urban public school in the US South; Phil (second author) and Kevin (third author) were ELA and social studies researchers, respectively, at a private research university, also in the US South. Despite the variations in our experiences and roles, we shared a dissatisfaction with both the narrow framing of "digital" and "civic" learning in prevailing models of media pedagogy (e.g. "digital citizenship"), and the disciplinary structures that compartmentalize promising alternate approaches in either ELA or social studies. Consequently, practitioner inquiry allowed us to collaboratively theorize from practice and practice emergent theories, as we worked to reimagine the conditions of digital civic literacies in Allie's classroom.

Unit design
Our inquiry took the form of a two-week unit, which we co-created over the fall and spring of the 2022–2023 school year. In keeping with practitioner inquiry's dialectical view of theory and practice, the design of this unit involved both reflection on our experiences as ELA and

social studies educators interested in the interplay of civics and digital technologies in these content-areas, as well as shared readings in relevant literatures (e.g. platform studies, civic education and speculative fiction) that might refine or extend our thinking on the subject. As described above, our conversations led, first, to the formation of our *digital civic ecologies* framework (Table 1), which coarticulated research from platform studies and civic education. We then used this framework to derive questions and associated lessons that would invite students to investigate different intersections of platforms and civic life – and to explore these relations through speculative fiction writing.

The unit included nine lessons corresponding to the nine intersections outlined in our framework (see Table 2 for an overview of the unit). Allie facilitated these lessons across five class sections, with a total of 85 students, in May 2023. The student population in these classes reflected the diversity of the larger school context: 34% identified as Latinx, 31% as White, 23% as Black, 12% as Asian and 1% as Middle Eastern. The first two days of the unit introduced students to the *digital civic ecologies* framework by having them engage in activities about the "social/civic identity" and "social/civic values" intersections, before initiating the speculative fiction writing assignment. Some of these activities included developing "digital technology inventories" to assess the saturation and influence of digital technologies in our social lives. Another activity invited students to draw identity maps and reflect on the ways that their identities are interpreted by and filtered through different platforms in their digital technology inventories. On the third day, students were introduced to the unit's speculative fiction assignment – over the course of the remaining seven classes, students would write a story set in the near future that grapples with the issues and opportunities that may logically unfold from society's digital civic developments. To prepare for this assignment, students studied a clip from the TV show *Black Mirror* as a mentor text for thinking about the relationships among technology, civic action and the speculative – and how the three might converge within their own stories.

The remaining days followed a similar routine: students engaged in a collective inquiry, progressing through the intersections of the *digital civic ecologies* framework and then continued working on their speculative fiction stories, guided by a writing prompt. These prompts were intended to help students consider how class activities and discussions might inform events in their stories. For instance, during the class dedicated to the "technical/civic identity" intersection, Allie introduced the ideas of datafication and algorithmic bias and its implications for civic identity, using examples from Noble's (2019) *Algorithms of Oppression*. Students were invited to discuss these implications in other areas of their lives – exploring questions like, "Should testing data drive school instruction?" and "Should data collection from Ring doorbells be used to 'protect' people?" As students turned to their writing, Allie invited them to consider how the day's conversations might figure within their stories, providing the prompts: How are characters in your story helped or hurt by the technologies they use or encounter (like "datafication" or "algorithmic bias")? How does technology "know" your characters? During these writing times, Allie would then confer with students one-on-one as they developed their stories.

On the final day, Allie facilitated a reflective conversation on the unit, asking students to share what they hope digital technologies might look like in the future and what kinds of civic actions might be possible to bring that future into being. Students were also invited to share what they felt they learned through the unit and what questions it raised for them.

Data sources and analysis

The material generated through the process of carrying out, and reflecting on, this unit became the data sources for the study. These included students' speculative fiction stories

Day	Framework intersection	Focus/activities	Writing prompt
1	Social/civic identity	• Digital technology inventories • Identity maps	N/A
2	Social/civic values	• Analyzing media "biases" • Drawing personal "filter bubbles"	N/A
3	N/A	• Defining "speculative fiction" • Analyzing *Black Mirror* clip	Develop one, or more, characters—keeping in mind civic/social interactions. Who is this character? How do they represent themselves in different spaces (e.g., online, in-person)? How do they interact with others in these spaces?
4	Social/civic action	• Analyzing article about Twitter activism • Discussing the advantages and disadvantages of digital technologies for civic action	N/A
5	Technical/civic identity/civic values	• Defining "datafication" and "algorithmic bias" • Discussing the effects of "datafication" on individuals and communities	How are characters in your story helped or hurt by the technologies they use or encounter (e.g., datafication, algorithmic bias)? How does technology "know" your character?
6	Technical/civic action	• Drawing the "problem" in students' speculative fiction stories • Brainstorming, discussing, and drawing forms of "civic action" that could be responsive to these problems	How might technological problems, or problems arising from technologies, in your world be overcome? Do the characters in your world try to enact forms of civic action? If so, how? What difficulties might they encounter in doing so?
7	Political-economic/civic identity	• Analyzing article about TikTok bans • Discussing issues of "ownership" and "censorship" as they related to private platforms	Who owns the technology in your world? Who owns the data? What do they do with it? How does it affect people?
8	Political-economic/civic values/civic action	• Reading about, and discussing, global impacts of digital technologies (e.g., semi-conductor geopolitics, cobalt mining, cryptocurrency and AI energy consumption)	Who are the "winners" and "losers" when it comes to the use of technologies in your world? What trade-offs or compromises are involved in using these technologies? What alternative possibilities might exist? Are your characters trying to bring about these alternative possibilities?
9	N/A	• Finishing stories for submission • Reflecting on the unit	N/A

Source: Authors' own creation/work

Table 2.
Unit overview

Speculative frictions

($n = 81$), as well as their pre-writing (e.g. brainstorming and narrative planning) and unit work (e.g. technology inventories and identity maps). Throughout the unit, Allie recorded daily fieldnotes ($n = 9$), which documented activities and interactions across her five classes and included a summative reflection to identify emergent patterns and takeaways. Allie also took detailed notes on the final day of classes, where students reflected on the unit and the forms of civic action that might help modulate the possible futures of technology in society.

We analyzed the data with qualitative analysis software (NVIVO) using inductive and deductive strategies (Miles *et al.*, 2013). Because the emphasis of the unit was on the civic implications of digital platforms, broadly, we initially coded the speculative fiction stories inductively to identify general themes in the topics that students chose to engage. In this process, we recognized AI as a recurrent focus: 49 of the 81 stories featured some form of AI technology. The majority of these used the term "AI" explicitly, but we also assigned this code to stories that described technologies commonly associated with AI, even if the term itself was not invoked (e.g. sentient machines, automated decision-making or personalized recommendation systems). The proportion of narratives focused on AI prompted us to target our investigation to this subset of stories, leading us to ask, what happens when young people use speculative fiction writing to engage in civic inquiry about AI technologies?

Answering this question involved additional rounds of analysis. We first used inductive coding to identify thematic and narrative patterns in students' writing (e.g. categories of AI represented and narrative resolutions), as well as in classroom discussions and reflections (e.g. shifts in perspective). We then drew deductive codes from our digital civic ecologies framework (Table 1) to document the *civic issues* at the intersections of civic and platform ecologies that students chose to explore. Finally, drawing inspiration from Jameson's (2004) notions of "utopian" and "anti-utopian" speculative fiction, we also coded the stories and fieldnotes for examples of *civic actions* that students referenced to see what, if any, forms of resistance, refusal or social transformation emerged within, or against, their imagined futures.

Findings

Through our analysis, we found that students imagined a wide range of intractable civic concerns associated with AI technologies. We also found that, with few exceptions, students' speculative fiction narratives strained to represent civic actions commensurate with the breadth or scale of these concerns. Significantly, our findings also suggest that, for some students, the process of speculative fiction writing allowed them to sit with, and reflect on, this asymmetry – leading to shifts in their perspectives on civics, technology and the relations between the two.

Breadth of civic issues associated with artificial intelligence

From the moment students learned about the speculative fiction assignment, they had no shortage of ideas for what to write about. In a fieldnote, Allie described listening in on conversations about a dizzying range of potential story topics, from the silly (e.g. "What if Joe Biden was an AI robot?") to the serious (e.g. "What kind of skin cancer affects your whole body?"). Given the timing of the unit – in May 2023, just months after the release of ChatGPT and amid the subsequent flurry of op-eds about its promises and perils – it is not surprising AI figured prominently in these discussions or in the unit itself. As Allie incorporated current events to link the unit inquiry with concepts students were hearing about with greater frequency, AI became a touchstone topic. The scope of these discussions is reflected in the categories of AI that surfaced in students' stories – the most common of which were expanded or intensified, versions of present-day AI platforms: for example,

robotic assistants ($n = 16$), automated monitoring/tracking technologies ($n = 15$), personalized recommendation systems ($n = 12$) and machine-produced art ($n = 10$).

As Table 2 illustrates, Allie covered a wide array of issues relating to emerging digital technologies in her unit activities – from mediated political polarization, to the environmental impacts of ChatGPT. Consequently, the breadth of civic issues that students traced from the multiple categories of AI represented in their stories extended beyond well-worn dystopian tropes like robot uprisings. For example, while a few gravitated to narratives of sentient machines overthrowing humans ($n = 2$), many more mapped the effects of AI along more subtle trajectories, like its expansion of punitive state power ($n = 20$) and corporate governance ($n = 8$); the degradation of human creative practices ($n = 14$), natural resources ($n = 11$) and working conditions ($n = 3$); and the spread of misinformation ($n = 8$).

One outgrowth of this expansive view of AI and its impacts, which we did not anticipate, was the multivalence of the civic issues students explored. While Allie's prompts were intended to encourage students to make a connection between the speculative and the civic, almost all of the narratives included multiple, overlapping crises – not just one. For instance, in one story a student wrote from the perspective of an activist journalist, who squares off against an increasingly totalitarian government that uses AI surveillance and internet censorship to amass control – all against a backdrop of online vitriol and unabated climate crisis. In another, a student described a working comedian whose career is being outsourced to AI "comedy-bots." Meanwhile, he contemplates the trade-offs involved in curtailing digital platforms' influence, like weighing government-protected free speech and online misinformation or access to low-cost hardware and the deplorable labor conditions that undergird its production. Such examples highlight not only the breadth of civic issues that young people associated with AI but also their understanding of these issues as interrelated.

Limited civic action related to artificial intelligence
Throughout the unit, Allie also prompted students to consider the civic actions that their characters or societies might use to address the challenges posed by technology. In line with Jameson's (2004) theorizations of "utopia" and "anti-utopia" and literacy research on the civic potentials of speculative writing (Mirra and Garcia, 2022), we were interested in if, and how, students' narratives might envision the future as something open or closed to political transformation. We found that, while students had little difficulty imagining the far-reaching implications of AI technologies, conceptualizing commensurate civic responses did not come as easily. Allie's fieldnotes included several exchanges with students who felt they had written themselves, or their characters, into a corner – where there was no clear avenue for challenging, much less subverting, AI's inimical impacts in their imagined futures. Indeed, our inductive coding of students' stories revealed that a significant number ended without any resolution ($n = 18$) and several relied on a *deus ex machina* (e.g. a sudden supernatural or government intervention; $n = 8$) to deliver society from harm. Such tendencies were suggestive, in Jameson's framing, of an "anti-utopian" undercurrent in students' stories, where the potential for political intervention appeared foreclosed.

This impulse toward anti-utopia was also reflected in narratives that did not rely on outside intercessions for resolution. Many students' stories did depict characters as having agency to resist and repurpose AI technologies for their own ends. We observed, however, that these accounts frequently focused on characters' self-preservation rather than collective action. In some instances ($n = 5$), the narrative concluded with the protagonist running away – for example, to a bunker in New Mexico or to the UK – to escape the imposition of AI technologies. In others ($n = 8$), characters found ways to work around or subvert AI to preserve their individual autonomy in the face of totalizing technological control. In one

story, for example, a character wears a mask in public to avoid being recognized by the state's facial recognition systems. In another, someone detaches their government-mandated earpiece – an AI assistant that monitors, and offers corrections to, people's thoughts, speech and actions. While there was an emphasis in these narratives on political self-determination, there was also a tendency for its representation to center the transformation of personal, rather than societal, conditions – a hallmark of anti-utopian narrative.

Even so, we did find flickers of utopian impulses in students' writing. Among the civic actions we identified, the two most common were protests ($n = 16$) and public consciousness-raising activities (e.g. speeches, investigative journalism and awareness campaigns; $n = 13$). In one story, for instance, a group of workers organizes a labor strike after they notice their jobs are being turned over to AI. In the narrator's words, "Not only were we fighting for our rights to not have our jobs taken away. We fought for what was right and not best for the people with the money." In another story, teenagers in Indonesia create a social media hashtag to expose the environmental harms of a fast fashion corporation using AI to scale its operations (Figure 1). Such examples depict the future as contestable, where communities have potential and means for transforming social conditions. With that said, we have referred to these as "flickers" of utopia because, even among the narratives that featured collective political action, we were surprised to also see a general ambivalence about its value. For every portrayal of protest as a generative tactic, three or four narratives positioned it as ineffectual – a symbolic swipe at an unchanging, and perhaps unchangeable, social order. Multiple stories referenced protests as a backdrop to the steady expansion of some new

User_123456:

My message to the world:

If u can see this, this is a cry for help. My name is Citra Tabuni and because of Fast Fashion I am mourning the lost of my country, I have lost the warm days when the sun hugged my skin, the waves that I rode with my surf board, and the happiness I felt when I woke up each morning. Pollution has spread like a disease across my country, Indonesia, and the rest of southeast Asia, sickening the enviornment and making me, my families, and millions of others quality of life worsen by the day, we suffer just to get by all because C corporation took over the whole country, they are the murderers. They control the jobs, the money we earn, all the technology, whats right and whats wrong, but I'm tired of living under the shadow of greedy old people and we will no longer tolerate it. By the lack of support we are receiving I know for a fact this isn't something that's being acknowledged worldwide, which is why I restored to making this post so everyone can hear about the horrors C corp is making, the same company that was once seen as an astonishing advancement for the fashion industry is now the reason thousands of people are suffering, and no one even knows. We are doing our best to end the sufferge by protesting and rioting but that isn't enough, we need your help to spread awareness and to put a stop to C corporation, I will follow up on updates, please help. **#StopCCorp**

Uploaded three hours ago

2.3 million likes

Figure 1.
Social media post in student speculative fiction story

Source: Student produced work from authors' classroom

technology: people gather in the street, but their dissent is materially disconnected from AI's unobstructed march of "progress." At times, characters voiced this sense of futility explicitly: one decides not to organize a protest because "no one will ever listen to me;" another pleads with her friend to leave a protest because it is hopelessly mismatched against the power of an AI-driven police state. Such accounts demonstrate that, while there was interest in representing collective responses to the multivalent civic challenges students associated with AI, it was not always clear what such responses might look like.

Civic potentials of the speculative form

Perhaps not surprisingly, most students were not especially bothered by the incongruity of civic issues and civic actions related to AI in their stories. For all the serious talk about civics and technology, it is worth remembering this was also an eminently *fun* unit for students. Allie's fieldnotes include references not only to students who requested to visit her class during free periods to work on their stories, but also to other teachers who were surprised by students' eagerness to complete a writing assignment in the final weeks of the school year. In light of this, we were cautious, in our analysis, not to overinflate the meaning of students' stories, much less to treat them as proxies for the totality of students' civic understandings. While patterns in their narrative structures were informative about what civic issues were pressing enough to represent and what civic actions appeared at-hand to their characters, we hesitated to ascribe additional weight to them. Even so, looking at these narratives in tandem with classroom fieldnotes, we did find evidence that, for some students, the disjuncture between AI's multivalent impacts and the limited civic responses available for confronting them proved consequential to their learning. Even if their stories strained to represent civic actions proportionate with AI's civic challenges, the process of speculative fiction writing itself allowed them to dwell in this tension in ways that shifted their understanding of both civics and technology.

These shifts were most overt in students' end-of-unit reflections. A repeated theme in Allie's fieldnotes from the final class session was how helpful students found the unit to be. For as often as students used digital technologies in their personal lives and at school, many indicated this was the first time they had been invited, in a classroom setting, to think about their relationship to technology and its broader social impacts. One student, for instance, described the "negative gut reaction" she usually felt when teachers brought up topics like digital literacy or digital citizenship because they seemed to focus on "privacy and catfishing" – that is, personally responsible uses of technology. By contrast, she saw this unit as going "deeper," pushing her to "make opinions [she] never had before." Other students, similarly, described how their thinking about technology and its civic implications changed as they considered each from the vantage point of an imagined future and contemplated how we might "act to make things better" and "advance in a good direction." While not a universal response, such reflections reveal that, although students' narratives themselves tended to veer toward anti-utopianism, some individuals were, themselves, reaching for ways to unsettle the inevitability of the technological and political futures they envisioned.

Significantly, we also found evidence that classroom conversations throughout the unit immersed students in the political uncertainties attached to emerging technologies like AI in ways that informed their speculative writing and civic understandings – even when these links were not explicitly named in end-of-unit reflections. Allie's fieldnotes include multiple examples of prolonged discussions that provoked variable alignments in consensus as students weighed potential responses to digital civic issues. In one class, for example, students were surprised when two best friends who rarely disagreed came to lead differing sides in an impromptu debate over the global politics of semiconductor production. We also found

instances where students shifted stances over time as their thinking evolved. In one case, a student who, early on, took the minority view that digital platforms were largely innocuous, later came to express concerns that AI technologies could pose a threat to human life when incorporated into the criminal justice system – a topic that became the focus of his speculative fiction story. We would add that we have good reason to believe that such perspective shifts persisted beyond the unit itself. As we were writing this article, the same student contacted Allie, well after the school year ended, to share a connection he made between class discussions and something he observed on social media. This served as a helpful reminder for us that, as fixed as the futures in students' stories seemed to be, the frictions the unit inspired were continuing to make changes in the ways some were thinking about technology and its civic implications, casting a utopian sheen on our reading of the unit as a whole.

Discussion

These findings offer a snapshot of the ways young people negotiated tensions between the speculative, as a narrative form, and the civic, as a site of political transformation – specifically, as they relate to AI technologies. We can see how the incongruity of civic issues associated with AI and the commensurate actions available for addressing them is reflected in the gravitation toward anti-utopian narratives, where the future appears foreclosed to material intervention. It bears repeating that, in identifying this tendency, we do not suggest it is evidence of some insufficiency in students' writing or imagination. Rather, we would argue it is symptomatic of a larger cultural indeterminacy about how to reckon with the intractable, compounded civic crises we face: from exploitative AI technologies to racial capitalism to climate catastrophe. Scholars of speculative fiction observe that, given the enormity and intricacy of these crises, and the absence of concrete starting places for confronting them, it makes sense that people – not just young people – increasingly reach for speculative narratives that portray the future as trending toward collapse: *The Walking Dead, Black Mirror, The Hunger Games, Avengers: Infinity War* and *WALL-E* (Canavan, 2021). When just futures feel increasingly unviable, such stories can be oddly therapeutic. They affirm our anxieties by reflecting them back to us, funhouse mirror-like, through grotesque extrapolations of the present. And they comfort us with chimeric resolutions, or with the assurance that, as bad as things seem, at least they are not *that* bad yet.

The appeal of anti-utopian narrative suggests, to us, a need for civic inquiry that takes seriously this felt sense of indeterminacy. As scholars have argued, civic education has long emphasized assimilation, via factual knowledge and procedural skills, into existing political structures rather than investigating the challenges that arise from them (Lee *et al.*, 2021; Magill and Salinas, 2019; Mirra and Garcia, 2022). And as students' stories in our study demonstrate, these challenges do not announce themselves as singular, bounded problems – they are multivalent and vastly distributed across time and space. To the extent that our frameworks for civic learning fail to engage this complexity, we should not be surprised when young people express uncertainty or ambivalence about the civic actions available to them. Through our study, we have come to see our digital civic ecologies framework as one resource for centering complex civic inquiry related to emerging technologies in schools. We witnessed how readings, activities, discussions and prompts related to different junctures of civic and platform ecologies helped inspire students' speculative writing to include facets of AI that, at times, even evade attention in media coverage. Students engaged AI technologies not as singular "tools," but as upshots of social, technical and political-economic relations, with expansive impacts in civic life – a perspective that goes well beyond the discrete skills prioritized in most "digital citizenship" education (Common Sense Media, 2023). In light of our findings, we see potential in adapting this framework for more targeted lines of inquiry with students. While our unit examined

platforms, generally – with AI emerging as a focus – we imagine future iterations could begin with questions geared toward investigation of specific "cases:" AI, virtual reality, social media or even classroom technologies. The interoperability of these platforms with one another, and with wider data systems, means that pulling the thread of any one will unravel a multitude of civic issues worth exploring.

Importantly, our study has also highlighted areas for further reflection. For the reasons described above, it is understandable that most students' narratives did not depict a contestable future for AI. And while we have suggested this evinces a need for civic inquiry that embraces indeterminacy, we are also conscious that dwelling in the complexity of civic issues, and dreaming possible solutions for them, is not a substitute for action. As scholars of justice-oriented social movements have cautioned, unless speculative practices can be converted into "transgressive experiments," they risk "conced[ing] the specificity of struggles in the material present as simply imagining what liberating social arrangements could exist in alternative worlds" (Rogers *et al.*, 2023, p. 165). While our findings suggest that, for some students, the process of speculative writing immersed them in the tension between AI's anticipated impacts (i.e. the speculative) and the modes of collective action available for confronting them (i.e. the civic), more work is needed to understand how this dialectic might give way to transgressive experimentation in, and beyond, classrooms. One avenue we are now exploring involves foregrounding this dialectic with students, cultivating a shared vocabulary for strategizing about material sites of struggle amid the indeterminacies of our civic challenges.

Conclusion

In this article, we have explored the tensions between the speculative and the civic as they surfaced in young people's imaginative writing about AI. Much like Tom Barnard in *Pacific Edge*, we have found this dialectic to offer generative potential for resisting the foreclosure of the future and for materializing actions to bring other worlds into being. In concluding, we want to highlight that we continue to think about this study itself, and our findings, in terms of this dialectic. To the extent that digital civic ecological inquiry and speculative fiction writing can engage students in the frictions and fissures between imagination and action, we see them as promising resources for civic teaching and learning across content-areas. But we would contend it is the struggles they elicit, not the answers they provide, that makes them promising. As our epigraph from Kim Stanley Robinson suggests, this is the definition of utopia: "struggle forever." We continue to wrestle, therefore, with how this dialectic, and the research and practice related to it, might figure into the project of a utopian civic education – one that refuses to concede the inevitability of our political and technological futures. It is our hope that this study contributes to the struggle.

Note

1. As this manuscript was going to press, another article was published that, similarly, explores "speculative frictions" in young people's compositions (Corbitt, 2023). While the focus and theoretical orientation of these works are different, we see promising overlaps in their treatment of "the speculative" as contested terrain and hope the coincidence of their coterminous publication suggests momentum toward further inquiry into such tensions.

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