Is Resistance Futile?: Early Career Game Developers, Generative AI, and Ethical Skepticism

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ABSTRACT

This paper presents a study that examines developer perceptions and usage of generative AI (GAI) in a summer professional development program for game development interns focused on mobile game design. GAI applications are in common usage worldwide, yet the impacts of this technology in game development remain relatively underexplored. Through a qualitative study using ethnographic interviews and participatory observation, this paper explores how GAI impacted the workflows, creative processes, and professional identities of early career game developers. We present a case of GAI integration that was not a straightforward adoption. Focusing on the interns' resistance, negotiation, and reimagining, we show that the interns were actively developing a new professional culture both *with* and *against* generative AI. For the interns, their ethical commitments to fellow game developers and the future of their profession were as important as their practical concerns about usability, utility, and efficacy of GAI tools.

CCS CONCEPTS

• **General and reference** → *Empirical studies*; • **Applied computing** → **Media arts**; • **Computing methodologies** → **Artificial intelligence**.

KEYWORDS

Generative AI, Games/Play, Qualitative Methods, Professional Communities, Creativity Support, Programming/Development Support, Future of GAI

ACM Reference Format:

Josiah Boucher, Gillian Smith, and Yunus Doğan Telliel. 2024. Is Resistance Futile?: Early Career Game Developers, Generative AI, and Ethical Skepticism. In *Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24), May 11–16, 2024, Honolulu, HI, USA.* ACM, New York, NY, USA, 13 pages. https://doi.org/10.1145/3613904.3641889

1 INTRODUCTION

Generative Artificial Intelligence (GAI) stands to significantly impact labor and design practices across a wide variety of industries [4, 22, 36]. This has resulted in a number of recent studies that investigate the impact of technology on design and creative workflows, and the potential for its usage as a design support tool (e.g. [2, 11, 20, 24, 58]). This paper focuses on the impact of GAI in an interdisciplinary context for early professionals in the games industry. As games sit at the intersection of computational technologies, design, media, and arts they are a rich domain for studying both the creation and impact of generative AI [31, 55]. Since so many intersecting aspects of game development are likely to be transformed with recent GAI advances, with the potential to radically alter the future of work in games and adjacent creative industries, they are also a promising domain for investigating the impact of these advances on young and emerging professionals.

For this study, we focus on Mass Digi's Summer Innovation Program (SIP). Operating since Mass Digi's establishment in 2011, SIP is a long-running professional development program based in the USA that trains approximately 25 interns within a period of 11 weeks. Because of its exclusive focus on professional development, SIP offers a fruitful ground to explore the reception of GAI in the upcoming generations of the games industry. Every summer, SIP hires rigorously selected, promising interns seeking to enter the games industry. Participants of the program form teams and create mobile games—from initial concept to publishing on an app store—using the Unity game engine. These interns come from a variety of educational and experiential backgrounds: from game development to music production to philosophy. Regardless of previous experience making games, they are expected to overcome challenges and gain the skills necessary to accomplish this task with a hands-on approach, rather than by direct technical guidance. SIP has an extensive track record of teams launching fully developed games, with links to previously launched titles available on their website [1]. In this study we call our interlocutors–the SIP interns–early career professionals because many are participating in their first paid game development positions as part of the program. This is especially important for SIP as the program has been designed to encourage interns to see themselves and interact with each other as *professionals*.

Foreseeing GAI's potential disruption to the games industry in the near future, the directors of the program encouraged the 2023 SIP interns to experiment with generative AI in their development processes. From the perspective of the directors, this encouragement aligned with SIP's overall mission and philosophy. We conducted this study of SIP to understand how early career professionals are conceptualizing AI in an interdisciplinary design process. How, if at all, are they using GAI in their development process? What harms or benefits do they identify in using this technology? How does their position as emerging professionals relate to their perceptions and usage of this technology? We collected

CHI '24, May 11–16, 2024, Honolulu, HI, USA

ACM ISBN 979-8-4007-0330-0/24/05
https://doi.org/10.1145/3613904.3641889

data for our study using qualitative research methods, including semi-structured interviews and participatory observation.

The main contributions of this paper are:

- A framework that categorizes resistance to GAI among young professionals in the program, as evidenced through observation and interviews. The major categories of this framework are: 1) friction in workflow, 2) ethics, agency, and ownership; 3) usability, utility, and efficacy; and 4) imagined GAI futures.
- A set of implications for research, design, and pedagogy that emerge from honoring young professionals' resistance to GAI and imagining futures that are responsive to their concerns.

Taken together, we provide a snapshot of the formation of the emerging professional culture at a time when GAI is being adopted into many mature industries at a large scale: [6, 40]. As such, we approach our participants' responses not simply as reactions to a new technology, but as active inquiries into the design potential and limitations of GAI. Our findings show that early career game developers are trying not only to navigate new technical capabilities, but also to develop ethical attitudes, investigate new workflows, and develop fluency in AI technologies. These findings prompt our recommendations for future study of emerging professional culture, the design of GAI tools and media, and focal areas for teaching about GAI in higher education.

2 RELATED WORK

We position our work relative to a) studies of sentiment toward and adoption of generative AI in creative industries, and b) parallel threads of scholarship in procedural content generation. Due to the nature of the study, we focus on GAI applications that were used in the program; our approach is not a comprehensive review of GAI tool usage, but rather an exploration of the experiences and reactions of GAI users as articulated in interviews and other interactions.

2.1 Reactions to Generative AI in Creative Industries

Especially following the public release of large language models (LLMs) in Fall 2022, there have been a wide variety of reactions to the role GAI can and should play in creative industries and beyond. There is significant concern regarding AI systems' social and environmental impact, as well as the underlying politics of AI design, implementation, and advocacy [8]. Fischer argues that GAI poses a fundamental threat to design and development due to its embedded systemic biases, risk of plagiarism and misinformation, and its human and environmental costs [15]. Jiang et al. find that artists identify harms to individual reputation, intellectual property, and financial risk that the artist interns in our study also report [25], and makes recommendations for policy change and counter-AI technologies to counteract these harms. Specifically focusing on the game industry, Vimpari et al. find that professionals are simultaneously excited, overwhelmed, and concerned about the introduction of image synthesis to their creative practice [55].

Nonetheless, despite these concerns, a common narrative for GAI is its potential to support and empower novice designers. For example, the popular game *Roblox* is integrating generative AI tools to all aspects of their design tools [52], and *Unity* (one of the most popular and commonly used game engines across all areas of the industry) features generative AI plugins and assets that support a variety of creative tasks, including textures, behavior, playtesting, and audio design [51]. Within the field of software development, a core part of the game industry, GAI shows promise in a variety of contexts through automating test case development, debugging, problem-solving, and maintaining legacy code [12].

Our study draws some parallels to production studies in games research that look at the consequences of and responses to design tools (e.g. [50, 57]). These studies are valuable explorations of how games are produced, highlighting how environment, tools, and practices result in game artifacts [5]. While we find these studies valuable, in this study we are less interested in how various aspects of production come together to form an artifact, and more interested in how the addition of a particular type of technology disrupts and reshapes personal and collective sense of professional identity. While our research data comes from studying a game production studio, the studio we study is an especially rich domain for studying the impact of GAI tools because its history provides a reasonable baseline for comparison.

Existing efforts to simultaneously address AI's threat to society and harness it for potential social and creative good have focused largely on recommendations for improving AI tools. Weisz et al. present design principles for generative AI that mitigate harm and promote safe usage [56]. Lin and Long offer speculative design as a promising approach for imagining positive AI futures [32]. Inie et al. advocate for participatory design practices that bring the voices of those impacted by AI into the creation of future technologies [24].

In this paper, we add our voices to those calling for inclusive and just futures for AI, and focus especially on how to translate concerns about AI felt by the upcoming generation of creative professionals into (a) productive future research trajectories, (b) approaches to tool design that honor community resistance, and (c) educational efforts that prioritize AI literacy, ethics, and development of new professional and cultural norms.

2.2 Procedural Generation as a Lens for Generative AI

The games industry and adjacent creative technologies already both use and contribute to advances in AI. There is a long history of the use of AI tools in game development, both for supporting the development process and integrating into play experiences [48]. Many of the motivations for GAI in the industry–including reduction of labor costs, enabling new business models, increasing access to game creation, creating new game genres–are ones identified by Cook as common motivations for studying AI in games [9]. Researchers and developers have seen much success in bringing AI to bear on major problems in the industry, such as cheat detection in competitive games [26], as well as to improve common development processes such as playtesting, bug reporting, and other labor intensive aspects of game production [17, 42].

The area of game AI most relevant to GAI is procedural content generation (PCG), which is the use of algorithmic approaches to design artifacts for use in games [49]. PCG has often been used in

games to automatically generate large amounts of content and increase variety of content [21, 46]. PCG is also used for co-creativity tools to assist with tasks such as level creation [30], and support tools have emerged to make these systems easier to understand [10]. While PCG has proved a valuable method of content generation, it is not without its criticisms. Creating a useful generator can often take just as much, or more, work than a hand-crafted alternative [48]. Furthermore, developers have found limitations in the variety of content generators are able to produce; players are often capable of identifying patterns between generated content [47]. Generative AI offers potential to expand the type of content that can be generated, such as more complex generative audio and music used to increase variety and interactivity of game music compared to non-generative methods [44], as well as the range of users that can make use of generators; producing content using GAI can take less programming expertise than PCG, instead relying on prompt design skills using natural language. Furthermore, given the prevalence of PCG in games, it would be expected that many game developers would be familiar with some of the common ramifications of partially or fully-automating design processes. This makes games an especially interesting domain to study reception of generative AI. And, as game scholars ourselves, a way of thinking about generative AI that is informed by PCG, especially views of PCG as a design material [27, 49], has informed our positionality as qualitative researchers.

3 METHODS

For the duration of the internship program, a researcher (this paper's first author) was fully embedded in their studio. We used a combination of fieldwork (Section 3.2) and semi-structured interviews (Section 3.3) and combined these data sources for thematic analysis (Section 3.4). The time period for this study was May – August 2023; during this time, a wide variety of off-the-shelf AI tools were available for text generation (including code) and text-to-image synthesis based upon natural language prompts. This study design was reviewed and approved by Worcester Polytechnic Institute's Institutional Review Board, and all interns and directors completed the informed consent process at the beginning of the program.

3.1 SIP Program Description

Situating our study in the internship program allows us to study perception, usage, and shifting professional perspectives on GAI for a complete development effort across multiple disciplinary backgrounds: from initial game concept development to publishing and marketing.

SIP is operated by a team of three roles, along with an advisory board. The Managing Director of Mass Digi oversees daily operations of the program at arm's length; after the first week of introductions, icebreakers, and explaining the program, the Managing Director's role is mostly to make announcements, make sure there are no glaring problems with the teams or their games, and subtly guide teams down the path to success. The Executive Director has little interaction with the interns, focusing more on administration and event organization, while the Producer comes in on a semi-weekly basis to assist the interns with organizing their time with tools like Kanban boards.

SIP hired 26 interns in 2023, assigned into 4 teams. Self-reported demographic information from a survey sent out by the program's Managing Director- which was completed by 19 (out of 26) interns- reveals that this group is more diverse than the games industry overall [28]. Within the cohort, there was representation from 6 unique academic disciplines. Intern ages range between 18-31 (median age is 21, mean age is 20). Of the demographic survey respondents, 8 interns identified as male, 4 as female, 6 as nonbinary, and 1 as genderfluid. Interns were also asked to self-identify their race and ethnicity in an open-ended question. 10 of the interns identified as white and non-Hispanic; 2 as white and Hispanic; 1 as white and Filipino; 1 as white and Middle Eastern; and 5 as non-white (among them, 3 as Asian, 1 as Asian and Filipino, and 1 as Chinese).

Each team had a balance of members dedicated to art asset creation and programming, with members assigned based on academic experience and background. Additionally, one intern was responsible for providing the music and audio for all four teams, and another intern was dedicated to the program's marketing efforts, including managing their blog posts and social media activity. For scoping reasons, teams were required to make mobile games using the Unity game engine, and they were advised to only develop game mechanics that they had seen successfully deployed before.

The first four weeks of the program focused on introductions, team formation, and pre-production. Throughout this time, the teams pitched, developed, and playtested multiple game prototypes, eventually choosing one to move forward with. Starting in the fifth week, the teams moved into full production mode and were expected to produce two builds of their game, deployed on mobile, each week. During this phase, multiple playtesting groups were brought in from the surrounding community, including school children, college students, and program alumni. The penultimate week of the program is branded "switch week," where the teams switch games and implement new features with unfamiliar projects. The final week of the program returned the teams to their own games, focusing on postmortems and wrapping up.

3.2 Positionality Statement

While the SIP and the authors are both affiliated with Worcester Polytechnic Institute (WPI), the SIP operates autonomously in terms of its direction and facilitation from the department that the authors are affiliated with. During the spring of 2023, prior to the start of SIP, AI in game pedagogy was a popular topic in university settings, and the mutual institutional connection led to the manifestation of this research project. The research conducted by the authors remains independent, and our research activities did not interfere with SIP activities even though our conversations with the directors revealed an alignment between our research and the motivations of SIP. Furthermore, the embedded researcher is himself a game developer and has an advanced degree in game development, making his presence mirror the common appearance of program alumni at SIP. Additionally, this allowed him to navigate the cultural discourses underpinning the work of game development in a collective setting such as SIP. Our institutional connection with the SIP directors offered further opportunities for insightful conversations, providing access to an insider perspective on SIP

activities and motivations behind their decisions. Aware of the program's professional development concerns, we wanted to explore learner-centered approaches to game pedagogy with GAI, allowing us to explore ethical questions such as those of transparency and exploitation.

3.3 Observation and Fieldwork

The SIP places interns together in an environment where they live and work as a community. This context encourages people to think about game development, not only as an individual's career, but as a culture of collaboration and cooperation. The directors of the program want the interns to see themselves as professionals and develop associated behaviors in preparation for entering the games industry.

Our research activities functioned as windows into this rich community through which we could view the full depth of their exploration as game developers. The research team was given access to the Ryver communication server that was used by SIP 2023 to make announcements, team discussions, and other day-to-day text-based communication activities. Additionally, the research team was given permission to do participant observation at the program's on-site workplace- located on the campus of WPI on a daily basis, as well as any game-showcase or professional networking events that were organized by the program's organization. These events included playtesting events where outside groups were brought in to play each team's games (these occurred in weeks 4, 7, and 10), a networking and game showcase event (week 10), and the final open house game showcase event (final week). Most importantly, program participants were willing and excited to converse with our embedded researcher about their experience in the program and their thoughts on game development and GAI.

The embedded researcher took daily field notes in the studio environment, conducted interviews, and attended all events. Observation notes were chaotic at times, as the nature of the program had interns scattered throughout multiple rooms; many teams stayed in the main work area, but some worked at nearby tables or even in their own studio setups; interns would stop by for a conversation, and suddenly get swept up by another development concern. These notes included observed behavior, work practices, and roles of people in attendance (such as visiting SIP alumni or a WPI public relations reporter).

The focus of all recorded data was on professional activities from a public-facing organization, and therefore the collection of this data was expected to pose minimal to no risk to the research participants. However, given the particular identity of the intern participants had no significant impact on the research findings, we decided to keep the identity of quoted interns anonymous.

Interviews with SIP participants and observation of the program were the most effective research method due to the highly contextual nature of the games industry. Development practices vary widely from workplace to workplace, and the workflows of individual developers are difficult to be meaningfully quantified for a comparison. The qualitative data gathered through fieldwork and participant observation methods offers insights into our primary concern in this study: how do game developers perceive, respond to, and utilize GAI as part of their workflow and creative processes?

3.4 Semi-Structured Interviews

Further supporting our focus on qualitative data highlighting the experiences of the program's interns, we used semi-structured interviews as an avenue for more structured responses. These interviews allowed us to explore the same questions we sought answers from in our fieldwork and provided an opportunity to view our interlocutors' perspectives from a different vantage point. All 26 SIP interns participated in these interviews, along with the managing director of the program. Interviews with each of the four teams with all team members present were conducted in the third week of the program; team groups had just been assigned, and interns were still getting used to their development processes. Starting in the fourth week of the program, all interviews were individual. Supplementary to the less formal interactions conducted in fieldwork, the embedded researcher sent open requests for individual interviews, and the response showed that many SIP participants were excited to voluntarily discuss GAI further. In addition to the open call for interviews, the researcher targeted interview requests to interns who were identified to have particularly insightful perspectives due to their role in the SIP or their work: this included two interns who the director assigned to look into GAI uses, and interns with unique roles such as the participants responsible for music and marketing.

Our interviews focused on GAI integration to workflow, preferences interns had for integrating GAI into creative processes; as the summer progressed, and informed by emergent themes from earlier work, we also explored interns' general disposition and attitudes toward GAI and their sense of its ethical implications for the games industry and future careers. We used semi-structured interviews with each intern, often with follow-up interviews following observation. The following questions were the template for initial interviews:

- What is the game you are working on?
- Have you made any games in the past?
- Have you used generative AI for any projects in the past?
- What generative AI technologies have you used so far for this game?
- How have you used generative AI in the process? If so, did you find it useful?
- Do you expect to use generative AI for anything in the remainder of your time in the program?
- How has the use of generative AI changed your experience or differentiated from your expectations of this experience?
- Do you think you'll use generative AI for making games in the future?

In keeping with the nature of semi-structured interviews, questions often expanded beyond the list above, following the experience and interests of the interviewee. Interviewees often volunteered new lines of thinking and would be asked to expand on their perspectives. While most of the structured questions focused on what the interns were doing and how they used GAI technology, many interviewees guided conversations toward discussion of the impact of the technology and ethical concerns. As some of these themes began to emerge, we developed additional questions for follow-on interviews:

- If you have avoided using GAI, why is that?

- If you have used GAI, did you have to overcome any concerns you had?
- Do you expect employers to ask you to use GAI in the future?
- How do you imagine GAI could be more useful to you as the technology develops?

Prompted by a disconnect between the observed perceptions of the interns and those of the program's directors—particularly regarding the potential benefit of using GAI technology—these questions shifted the focus from what the interns were doing to why they were doing it. These questions eventually opened up conversations regarding the interns expectations of GAI's integration into work practices beyond their SIP internship.

3.5 Data Analysis

Individual and group interviews with the interns and program leaders were recorded using a voice recording app on a mobile device. 20 interviews were conducted throughout the program's duration; 4 of these were group interviews with the teams, 3 were with the director of the program, and the remaining 13 were with interns who volunteered–some of whom volunteered for interviews multiple times, resulting in 10 unique interns across the 13 interviews. All interviews had an average duration of 9 minutes (leading to an average transcript length of 1,500 words for each) to allow for minimal disruption of program activities. Recordings were then transcribed using the Descript app and edited to verify accuracy of the transcription.

It is important to note that these interviews happened as part of the ongoing fieldwork. On a normal day of fieldwork, the interviewer would be already spending several hours with the teams: interacting with them, watching their work, having lunch with them, or sometimes even answering their questions about game design and programming. The interviews happened amidst these interactions. For that reason, the interviewer was able to jump into the conversation with focused discussions, leading to dense data.

A significant amount of contextual information became available to the research team through participant observation during the fieldwork. While the data collection from participant observation did not generate quotable material for publication, these aspects of our research provided critical context in analyzing the interview quotes and played a vital role in forming our conclusions. The experiences of our embedded research better allowed us to capture the richness of perspectives conveyed in interviews, as well as elements that could not be captured in the interviews.

Thematic analysis was done manually using Microsoft Excel [37]. It occurred in two phases. The first phase occurred while the program was still in progress, and took the form of gathering data, identifying quotes, looking at field notes, and coding the data. Each week of the 11-week program, the research team performed an iterative coding process— gathered field notes and interview data were reviewed, discussed, and coded, allowing each week's progress to inform further interpretation of the data. A major milestone occurred in week 4 of the program; shortly after the group interviews in week 3, the research team observed that the experiences and concerns expressed in these group interviews (differences between programmers and artists, etc.) continued to be repeated in individual interviews in following weeks. Reflecting on this caused us to shift our approach, focusing not strictly on tool usage but expanding the research domain to consider the interns' professional development and future career visions. Towards the second half of the program, as the practices of the interns became more ingrained, new perspectives around GAI tools began to emerge, allowing us to expand on our initial findings regarding tool usage. This dynamic approach to fieldwork enriched our interview data, allowing us to better capture the depth of the interns' experiences.

The culmination of this first phase of analysis resulted in 73 quotes (average of 103 words) categorized by 1) the role of the quoted individual and 2) recurring themes. Using an informal inductive and deductive coding approach that privileges semantic and experiential analysis [45], we identified four surface level categories and used them as codes to tag our data: diverging perceptions of GAI's benefits, type of work (programming vs. art asset creation), skills to benefit from GAI, and discontent with GAI.

The second phase occurred after the completion of the program, allowing us to bring context into the data. We looked at conversations with the program directors, documents from the intern's processes, and theory and research of others to refine our initial thematic categorization. This helped us build a thicker interpretive lens for making sense of the interview data. Our second round of thematic analysis took a deductive approach, focusing on a question that we had not initially expected to find as a recurring emphasis across the interviews: doubts about GAI's premise for the interviewees' professional work. Because of the tension between the Program's encouragement and the interns' doubt, we conceptualized this as 'resistance to GAI'. Unlike the first phase's inductive approach, the second phase used 'resistance to GAI' as a conceptual lens through which to view and interpret the interview data, including the codes from the first phase. From these codes, viewed through the lens of 'resistance to GAI', we identified four themes that we will discuss in 'Findings'.

4 FINDINGS

Most interns were eager to share their thoughts and concerns about GAI. Yet, our findings suggest that an overwhelming majority of the interns were skeptical of the claimed benefits of using GAI in their workflows, and that many even refused to use GAI tools for any part of the development process despite repeated encouragement from the program director. Some of the GAI applications used by SIP interns include ChatGPT [38], MidJourney [23], Github Copilot [16], and Dall-E [39]. Coding of the collected data resulted in four major themes: Friction in Workflow (Section 4.1); Ethics, Agency, and Ownership (Section 4.2); Usability, Utility, and Efficacy (Section 4.3); and Imagining Beyond Resistance (Section 4.4). Many of these themes overlap at times; we reflect on the overall interpretation of intern resistance to GAI in Section 5.

4.1 Friction in Workflow

Despite the program's directors encouraging interns to use GAI, the most common sentiment expressed in interviews was a general skepticism about GAI. The interns were encouraged in the first weeks of the program to utilize GAI tools for producing game content and brainstorming, but many decided not to pursue it

further than initial experimentation. One intern described their experience working with MidJourney:

> "I found that it does really well with more, not vague, but more, like, emotion based, kind of, like, a general vibe, I guess. So if you want it to say, like, 'Oh, you know, give me a painterly version of a photo of a dog with some flowers in the background' or something like that, it would be able to do that really well, but it struggles to do more specific, like, 'okay, I want a picture of a person, you know, facing the camera, but looking over their right shoulder, holding, you know, whatever the thing is.' I found that especially when you try to do different poses, it gets really confused with, like, you know, you'll get like three arms or no arms, or an arm missing. So it seems to struggle with that, and then just like, you know, obviously it's more of like a- I guess concept, just concept art. The details, it still struggles on, if you need something very specific."

The specific type of work being done and the GAI tools available to assist in the workflow of relevant tasks resulted in various levels of friction regarding SIP intern's perspective and willingness to engage with GAI tools. SIP programming interns found use in tools such as GitHub Copilot [16]- a GAI software that assists programmers with features such as auto-complete code suggestions. As one intern put it,

> "GitHub copilot is kind of the golden standard for that kind of tool. Programmers on my team are already using it, and I know of others on other teams that are as well." Another intern discussed how GAI tools were more useful than commonly used programming practices such as searching Stack Overflow [13], a web forum where programmers of all experience levels ask questions and exchange helpful solutions: "I have effectively replaced Stack Overflow with it when I do code. Sometimes it's faster than looking up Unity documentation, sometimes it's slower and it's just easier to Google search the exact function I need."

The use of this technology brought some ethical concerns at first, but programming interns changed their perspectives over time.

> "[The ethical questions don't come up] a whole lot anymore. When [the SIP Director] first brought up that he wanted to encourage us to use [GAI] this summer, there was some hesitancy. I know from what I've heard, a lot of the artists still prefer to stay away from it, either for ethical reasons, or just because it's not as good at concepting as would be useful. On the programming side, I think we've kind of just accepted it."

This acceptance of GAI tools for programming was expressed by many of the SIP interns. One intern expressed they viewed programming differently from art in the context of GAI:

> "Personally, I see [code as] a solution; not really like my own work, necessarily. It's not as personalized as art is."

Unlike the programmers, interns creating art assets for their games avoided using GAI for most of their work. One reason for this is that art interns struggled to effectively find places to fit GAI into their workflow. The integration into creative workflow was especially a challenge because it was not always easy to translate emotions the artists want to convey in a language that works for generative AI:

> "A good example would be that one of our [game concepts] is a cyberpunk setting featuring crabs, and the image generators that we used didn't really know how to draw crabs accurately. So, we just sort of got, like, misshapen masses of crustacean limbs. And honestly, the unsettling-ness of that [result] sort of rendered its concept art uses null. It was hard to get something that evoked the feeling that we were looking for."

Ultimately, for the artist interns, GAI-generated assets were not game-ready, and often lacked consistency. As one intern put it:

> "we need game-ready assets, and [these tools] just can't do that yet."

Where programmers were able to take the output of their available tools and integrate them into their process, artists did not perceive any use for the products the tools made.

4.2 Ethics, Agency, and Ownership

The most strongly expressed resistance to GAI came from artists who had ethical concerns about topics such as copyright and art theft:

> "I think [the issue of copyright has] definitely made us much more conscious of how we're using [Generative AI Tools]... Midjourney is not trained on just, you know, open source Midjourney-owned images, so we don't feel comfortable using any of the images [it produces] in the game."

These concerns prevented most artists from pursuing GAI-generated art for their final products:

> "I would be surprised if any of [the SIP teams] include any sort of AI generated art [in their games]. Because, yeah, at this point in time, it's just not... The legal and online [aspect] is just too gray for any of us really to feel comfortable using that sort of stuff. Especially... if you're making just kind of a hobby project, it may be different, but [when] you're putting it on the app store where, even if we're not charging money for this, it's the possibility of making money off of it for like ads and that sort of thing. And also just having a published game with your name attached to it, [it] doesn't feel right to have art that you did not create and also that you can't even get proper credit for."

Artists also expressed viewpoints on data training and compensation practices:

> "I don't think that, as it is right now, it's completely ethical. I think that there should be compensation for the artists and that [GAI training data] should only have been scraped from, like, stock images or royalty-free stuff. So, I support Adobe's new program Firefly,

> but I'm not completely comfortable using Midjourney [for] anything apart from, like, pre-production."

Some artists offered further nuance to the context-specific considerations of GAI tools by discussing phases of production and what art will be included in the final product, reflecting on the importance of artist agency and authorship across all areas of the production process:

> "I think there is [a distinction to be made between using GAI in pre-production and using it in the final product], because it's the difference between making a Pinterest board out of someone else's images and actually publishing those images as your own… To be honest, I actually do have some issues with AI's use in pre-production as well. Because pre-production is usually where artists are adding their own original ideas. It's where you're figuring out the content of the game. And that's where storytelling and the, you know, human experience in the art is most important."

Another artist expressed a similar perspective:

> "We all tested it out a little bit at the beginning, but [my team members] were hesitant to move forward with it just because of all the legal and moral issues surrounding it. Yeah, so it didn't move beyond the 'just kind of experimenting and messing around with it' stage."

Additional questions arose regarding who actually benefited from GAI tools, especially around corporate pressures. One intern shared their outlook:

> "I think it's ultimately going to be detrimental to the vast majority of artists and beneficial to a select few companies who are obviously going to gravitate towards it because it might mean bigger profits faster. I can only hope that the amount of artists and, like, audience opposed to it will be enough that the backlash from using is great enough that companies won't do it."

4.3 Usability, Utility, and Efficacy

Additional resistance to GAI tools came from a lack of efficiency and quality of GAI-generated art. As one artist put it:

> "The amount of time that it took me to try and get it to work ended up being more time than it would [take] if I just drew it normally."

This sentiment was expressed by many of the interviewed artists. Concerns were also expressed about the usability of generated products. Many of the artist-produced images used multiple layers for in-game animations, as well as specific image resolution values; qualities which the generated assets did not fulfill.

Artistic quality was also found lacking in generated results:

> "As a writer, I hate to think of a future where games are written by AI because, at least where it stands right now, the AI has a very specific voice that it uses when it generates content. And it's awful, like, as a writer, I cringe. Like, I'm sick of reading things generated by an AI because of the author's tone it has. And I'm just, like, this is- it's just- it's too verbose."

Programmers, in contrast, found GAI tools to meaningfully assist in their workflows, increasing efficiency and quality of their work.

> "It's definitely a time saver just in terms of kind of typing and sometimes just kind of thinking time. Being able to just say: 'Oh yeah, that looks right. Okay.' is a lot faster, sometimes, than actually planning it out. So, there are benefits other than just people think it's new and cool."

Another intern programmer expressed how they learned how to best use GAI for their own work, reflecting on the process of integrating it into their practices:

> "I think over [the past two weeks] while I'm working on this, I've used it less and less for 'write the entire script' and more for 'Oh, write the specific function that will, like, grab the nearest object of this kind from this parent.'"

Interns also expressed a shared concern that there are taken-for-granted assumptions about GAI due to a desire to increase efficiency of development tasks. Some interns rejected these assumptions after their attempts to use GAI to create game-ready 2D assets:

> "I just find it really difficult to use. You can't really… it's really hard to adjust a lot of your images, and a lot of the good images come from putting in [prompts] like, 'made on Art Station', 'made by This Artist', 'in This Style by This Artist'. It's just not something I want to spend time writing the perfect prompt for when I could just draw it."

4.4 Imagining Beyond Resistance

Many interns who expressed resistance to using GAI tools were far more open to tools that were trained off of voluntarily-provided data. Adobe Firefly, which uses training data exclusively owned by Adobe, was brought up by many interns in a positive light:

> "The main reason that I'm hopeful about [Adobe Firefly] is because all of the images that they're using to train the model are owned by Adobe/open source… It sounds like they are not going to be running into the same copyright issues that most, if not all, of the other generative AI programs are getting into with, you know, using people's work without their permission… I think that even for that reason alone, that it's going to be more useful than any of the other ones."

Other interns reflected on the promise of such tools in terms of impact on workflow. One showed the researcher features that were listed on Adobe Firefly's website, expressing an interest in their ability to make repetitive or less artistically expressive aspects of their workflow easier.

Another intern expressed interest in hypothetical tools trained from a pool of their own work:

> "I think one of the programs said that they would like to be able to have [a feature] where, like, you could upload a sketch that you've done, and you could almost train your own program on your work. So, it'd

> be like, 'okay, I have this set of all the artwork that I've done in this one style. Now I'm going to do a sketch.' I would put [an unfinished artwork] into the AI and it would be able to either line it or finish it in the style of the other pieces that I've done so that you could get, like, a really consistent style without having to recreate the wheel for the other pieces that you've done."

Overall, context-specific tools that enhance the capabilities and workflow of the worker, rather than tools that replaced the worker, were also well-received. Many of the programmers found this to be the case with existing technologies that are available, finding workflow-assistive tools more valuable than workflow-replacement tools:

> "I definitely use [Github Copilot's Auto-Complete] much more [than Chat GPT]. I rarely actually go into Chat GPT… but I find that when I do use it, it's more of like- it's particular use case is kind of getting you unstuck from a spot rather than just integrating it into your regular flow… Sometimes it gives solutions and sometimes it's just kind of to bounce ideas off."

One intern considered the future of GAI tools in the context of Photoshop's previously ground-breaking magic wand tool, reflecting on how quickly new technologies become normalized in workflows for reducing tedious activities:

> "I'm most optimistic about the more niche tools… at one point, the selective fill in Photoshop was brand new- and I believe that uses some sort of artificial intelligence or machine learning or whatever to select something- and it's just a little magic wand. At one point that was like: 'Oh my gosh, you don't have to manually select things. What is that?' But now it's not something that we don't really think about. You know, it's, 'Oh yeah, you want to select the outline of the shape, just use that tool.' But, you know, no one is arguing that using the select tool is not art. Because it's just one tool that makes repetitive tasks [that artists can do] easier… It lets them focus on more creative works than having to manually, you know, like, click and draw and drag around something."

Another intern gave an example of an imagined but unavailable GAI tool that could augment a specific part of their process, comparable to Photoshop's magic wand:

> "I've seen other [GAI tools where] you can take a sketch and you can upload it, and it will try to, like, line the sketch for you… I think that sort of thing could be really neat."

Looking to their professional futures, the interns also expressed mixed thoughts about how GAI would factor into their career prospects. One artist did not expect companies to ask workers to use these tools:

> "I don't think that employers will expect people to use generative AI. Just because, again, of all the legal issues. Especially, you know, with companies making money, I highly doubt that they are going to want to risk any sort of copyright issues with their product."

This was in contrast to the expectations of the director:

> "What we're getting from the game industry is… as long as we can do it without getting sued, we're gonna use [GAI tools]."

And the programmers seemed to accept GAI as an eventual inevitability:

> "I know there's some talk of the law kind of starting to catch up to what the technology [does] and how it's advancing. But I think however that goes in the future, it's going to be a part of every programmer's life and I think those who aren't comfortable with it will probably get left behind in job searches and stuff."

5 INTERPRETING GAI RESISTANCE

Given the massive amount of media attention given to GAI, we were surprised to find the interns' initial resistance and continuing reluctance to use it. One key difference between SIP and a more traditional professional workplace is the amount of freedom given to the interns. While they were all encouraged to use GAI, there was no requirement to do so. Developers in a games company may be more strictly required to implement this technology into their workflows and may be less resistant to doing so if they are used to taking instructions at face value. This comparison is important: primarily because of the space of experimentation and co-learning provided in SIP, the interns were able to prioritize the process of figuring out how to make this technology work for them, rather than being forced to make themselves work for the technology.

We want to be clear that most interns explicitly expressed their awareness of the possibility that the nature of their work will change due to GAI in the near future. Some also believed that those without the knowledge and experience necessary to leverage this technology game may be left behind in professional contexts. These could be enough reasons to embrace GAI without question. Indeed, through the SIP, the interns had the rare opportunity to explore this emerging technology in an environment where the primary benefit was their own professional development, rather than being required to leverage GAI to increase or improve their work output by an employer. Interestingly, though, the interns did not view the opportunity in this way. The SIP director hoped to prepare the interns for the uncertain future, in alignment with common motivations for incorporating AI into the game design process [9], but many interns interpreted the push for using GAI as motivated by managerial concerns for efficiency.

A common theme across our findings is the skepticism the interns feel toward GAI. For many interns, the promise of GAI did not match its payoff; while some found it useful for certain tasks like predictive text for coding, the overwhelming perspective was that GAI often produces imperfect or misleading results. This resulted in many interns avoiding the technology entirely, claiming it would take less time to simply handcraft the output they sought, rather than working with a generator to provide something useable. This was particularly true in the case of artists, who tended to view GAI tools as designed to replace them; many expressed interests in hypothetical or yet-to-be-released tools, such as Adobe's Firefly, that

offered tools to assist their workflow rather than replace it. Even for those who chose to use GAI tools, they found themselves needing to check the result against their own knowledge or other sources; this workflow simply aligned more closely with what programmers already did.

5.1 Differences in Artists vs. Programmers

A major reason for the difference in experience for programming interns as opposed to the artists is their underlying ways of thinking and knowing. Guzdial et al. have argued that, for many in our interns' generation, their consistent usage of digital tools and algorithmically-mediated culture means they have a certain baseline way of computationally thinking [18]. Computer scientists are, through their disciplinary education, trained to understand their craft as iterative and modular, and their workflow as one of breaking down problems to solveable sub-problems. Their existing practices of searching the internet for answers to complex problems translate well to prompt engineering. But more broadly, they have ways of thinking that align well with treating GAI as a problem-solver. Artists, on the other hand, are trained in artistic and aesthetic ways of knowing. Not only do they typically have less formal training in computational thinking, but many are trained to think in ways that sit outside computational thinking. Artistic ways of knowing include perceptual awareness, creative interpretation, and qualitative awareness [19]. Our fieldwork conversations with the interns who identify as artists suggested a similar conclusion: almost all of these interns identified a deep misalignment between GAI and related computational methods, on the one hand, and sources of artistic creativity and their creative workflow, on the other.

We posit that this is a reason why most of the SIP programmers showed a greater affinity to benefit from GAI; many of the programmers expressed that the currently available tools integrated easily into their workflow, resulting in minimal friction. Contrarily, artists perceived more vulnerability to lose jobs or to have a less satisfying and meaningful experience in performing their work; they also expressed that the tools at their disposal were simply not designed for them.

Artists perceived the intent behind GAI tools as something to replace them, rather than assist their process. In a similar study that used semi-structured interviews with professional programmers in the games industry, Pfau et al. [43] found that the developers they worked with often approached AI techniques through the lens of efficiency, effectiveness, and ease of use. This seemed to be one of the major factors that separated GAI tools for programming from those for art, indicating that specialized tools designed with and for artists would benefit artistic workflows more than general purpose ones.

5.2 Types of Ethical Concerns

A critical distinction between art and programming in the context of using GAI tools in their workflow comes from their differing perceptions of the ethics of professional identity. Programming interns expressed that they viewed bits of code as a solution to a problem rather than something that belongs to them, and therefore had fewer issues using technology trained on data that may have been scraped from the internet. As they began to see parallels between their typical workflow (which already involves incorporating code found through web searches) and the affordances of GAI, their initial skepticism regarding the use of training AI models shifted. With this shift, GAI stopped registering as a potential ethical problem for their work even though some of them continued to acknowledge ethical questions in non-programming applications of GAI.

Artists had deeper ethical questions to grapple with because the GAI tools they were considering produced the final product of their work rather than a small piece of it. While many artists may look to the work of others for inspiration, SIP interns directly expressed legal and ownership concerns regarding the explicit use of others' work for their own benefit and viewed GAI in this way. They did not think that working on, say, AI-generated image would make it their own creation. Although many in the game development industry have found themselves in a popular hype in which GAI is being 'imposed' on them with an anticipation of increased efficiency, the SIP interns actively responded to the possibilities and limits of GAI tools. This suggests that GAI mattered not simply because of its technical capabilities as tools, but mainly through its affordances as materials in a meaningful design process. Unlike the popular rhetoric of GAI that presents AI as a singular technological entity, the interns encountered GAI primarily as instantiations in design. Here, what we see is a blurring of the boundary between ethical inquiry and design inquiry. Ethics becomes a design concern, and design becomes an ethical question.

Many interns expressed positive views of GAI tools that might have the potential to augment their workflows without breaching perceived ethical boundaries. However, they were largely unwilling or unable to imagine ways to use existing off-the-shelf tools in this way. The tools that saw the most use and acceptance amongst the interns, such as GitHub Copilot, were able to fit neatly into their existing workflows, emulating and expanding the tools already at their disposal. Amershi et al. [3] acknowledge the tradeoff between generality and specialization, and most of the general-purpose tools SIP interns explored were found to be lacking for their specific needs. This finding mirrors other work in the field of AI for game development; other successful cases are built for niche application areas and tend to replace repetitive and/or monotonous aspects of development [17, 42], or aspects that are difficult for humans to solve without technology [26].

6 IMPLICATIONS FOR IMAGINING GAI FUTURES

The SIP is a collective of young and emerging professionals from a variety of institutions who are working in interdisciplinary teams for an entire development cycle. Our study of this community revealed predominantly a sense of resistance against the use of GAI and skepticism over both its utility and appropriateness. In this section, we explore the implications of their multi-faceted resistance to GAI by viewing the SIP as a microcosm: 1) for the upcoming generation of creative professionals, 2) for uptake of GAI tools in a multidisciplinary community, and 3) for students studying game design and development in higher education.

The resistance to GAI shown across all areas of the SIP is important to integrate into our designs for the future of generative AI. GAI has differing amounts of friction for existing workflows in the

field, introduces ethical concerns related to agency and ownership, and remains difficult for this audience to use meaningfully. At the same time, they are not closed to the entire concept of generative AI; rather, there is a hopeful sense among the interns that there are potential usable, ethically acceptable, low-friction GAI tools in the future. Designing them cannot happen in isolation, however; the community of potential users, how we educate this community to think about and understand GAI, and how we design the tools are deeply interrelated.

6.1 An Emerging Professional Community of GAI Practitioners

After the public attention to general purpose GAI in late 2022 and early 2023, most industries started to consider the implications of workplace adoption of GAI. While some believe that it is still too early to assess GAI-powered workplaces, consulting companies, business magazines, and futurists are already trying to anticipate the mid- to long-term consequences (e.g. [33]). From the perspective of our study, these predictions look rather techno-determinist, as they tend to focus on the individual user of GAI, overlooking the cultural identities and values that shape a professional community. For instance, the artists in our study, who might have a strong sense of the distinctiveness of their artistic taste, tend to consider the broader community of artists in game industry as their reference point when they discuss the implications of GAI on their work. Unlike the 'methodological individualism' of future predictions of economic impact, the early career game developers we worked with see their future connected to others in the industry.

But, why does this matter? If the significance of GAI for the future workplace lies in its integration into workflows, game developers' response to GAI with new sensibilities, attitudes, and skills is especially important. The interns will become the first 'AI-native' generation of game developers. In their first publicly-available games, they already were asked to engage with GAI. It is very likely that GAI will become part of the work they do in the games industry, an environment that will potentially not make its usage optional. As we discussed above, their initial response was not a full-scale adoption without a critique. If this serves as an indication of their professional trajectories, they will navigate the games industry landscape simultaneously *with* and *against* GAI.

Focusing on the study of communities and collectives, rather than the individual developer, is ripe for future research. The study of GAI in game development needs to take professional cultures seriously in order to understand the emergence of new artistic and technical practices among game developers. The focus on professional cultures is, of course, important to contextualize common practices of tool use (i.e., why, how, and when a tool is or is not used to do what task with what purpose), But, there is one more layer: professional cultures also mediate design imagination in game development. To what extent do GAI-developed images, videos, or texts support experiences that game developers want their games to generate? From the framework of game design, game developers' shared vision determines what constitutes valuable experiences in games. GAI will have an impact on these visions, but game developers actively filter such potential impacts through their interactions with each other in professional spaces from educational programs to Discord channels.

6.2 Conceptualizing GAI as a Tool

What can emerging practitioners' initial resistance to the uptake of current GAI tools tell us about the needs for future GAI technologies? Large language models and text-to-image synthesis tools are a burgeoning industry in 2023. General purpose tools such as ChatGPT have been used by 19% of US adults, with its highest usage rate among 18-29 year olds [41]; furthermore, the availability of highly customized tools continues to grow. The current hype surrounding AI [7] may reasonably feed the cynicism some interns display in their resistance to GAI. We will eventually emerge from this hype cycle, though, and it is important for us to create GAI technologies that honor and are responsive to the resistance displayed by current young professionals.

Much of the interns' resistance to GAI is traceable to a resistance to dominant ideologies and politics in the underlying technologies. Current narratives of these tools as productivity-enhancers, time-savers, and replacement labor [17, 42, 44] run counter to the values held by this generation of artists, designers, and (with some exception) programmers. The commodification of the artworks produced by both their peers and those in positions they aspire to via taking their work without consent for training data further exacerbates this divide [8]. Computational processes shape the way that we think and behave [54]; we interpret the interns' resistance to GAI as a reflection of their skepticism about these new ways of thinking, as well as their fear of GAI's dominance in the field. The interns' comments–particularly comments by the artists who expressed positive attitudes toward theoretical GAI tools that aligned with their workflows and values–suggest that what is needed is, instead, a future of GAI that honors the current practices and values held by creators, including a respect for existing norms of attribution, ownership, and creator agency.

The interns were often captivated by the language of "tools", in part in an attempt to deliberately distance themselves from the over-hyped and over-ambitious discourse of GAI as a replacement for human labor. This is a common rhetorical strategy not only for the interns—and the authors of this paper—but for researchers as well [53, 55]. There is no doubt that this is an effective response to the current moral panic as it reasserts the role and place of 'human skills' in creative industries. Yet, tools are commonly viewed as passive, manipulable, and unthreatening, and, as such, the idea of 'GAI as simply a tool' does not help us understand the interns' process of 'figuring out' how to work with GAI. Thus, instead of seeing AI 'as a tool', we propose an alternative framework that shifts to GAI's role in design inquiries into the limits and possibilities of creative expression in game development. This reconceptualization of GAI as a medium for expression is already common in the procedural content generation (PCG) research literature [21, 46, 48]. Treating generators as materials or as media provides both an avenue for empowering artists in creative expression and provides a richer framework for conceptualizing the role GAI can play and the design of technologies that creators wish to use.

6.3 Integrating GAI into Game Education

The SIP interns are all current students in a variety of higher education institutions in the northeast US, from a diverse set of majors including game development, computer science, studio arts, music, and philosophy. As of this writing, all are returning to their home institutions, continuing their education in an environment that—like most of higher education [35]—is grappling with the role of GAI in the curriculum. In this section, we explore the implications of student resistance to GAI for educators, and make recommendations for how students could study GAI alongside the foundational theories and core competencies of their respective disciplines.

With the exception of some of the programmers, who were capable of identifying similarities between using GAI and other forms of searching for solutions, students largely rejected GAI as being in misalignment with their process, resulting in concerns about both utility and efficacy. Programmers noted using code generation tools can be like a natural continuation of searching for code online, which fits into two forms of common programming process: systemic problem solving approaches [14] (i.e. searching for solutions to well-defined problems) and bricolage [29, 34] (i.e. mixing found code toward a workable solution). In exploring GAI in education, focusing on processes—including developing new processes—that align to existing GAI tools may allow students to best explore their usage. While we do not advocate for this as a permanent and universal change in creative practice, it is important to give students space not only to develop workflows and creative processes that meaningfully incorporate new technological advances, but also to reflect consciously on their own process and make informed decisions about the one that best works for them. In an interdisciplinary environment such as many higher ed game programs, there is also the possibility to have students reflect and integrate processes from different areas – for example, incorporating common workflows in programming to the visual arts, or vice versa.

We note that the interns often integrated their comments about ethical concerns with GAI with their practical concerns; this is especially notable for programmers, one of whom treated the ethical concerns as ones that were easily overcome once they found utility in the tools. Artists, in contrast, conflated their ethical considerations with legal concerns, especially with copyright matters. There is a need for more meaningful ethics education for GAI that spans disciplinary contexts and provides students with clearer language to support multiple ways of thinking about ethical and political matters. This is important both for describing the current landscape of GAI and supporting these young professionals in co-defining the future of GAI in creative industries. While today they are largely resistant and reluctant users of existing GAI technologies, they will soon enter an industry where they co-create new tools and forms of creative expression that use, respond to, and co-exist with GAI.

The interns noted some uncertainty around how to effectively use GAI tools, driving much of the resistance in terms of efficacy and usability. The sample prompts students gave as examples of both ineffective and unethical (e.g. referring to popular art websites) were quite vague, and—while artists especially noted that it is faster and more desirable to draw than to engineer a prompt—this still points to a lack of developed skillset in prompt design. Since the internship had such a heavy focus on producing quality work in the service of developing a publishable game, it is perhaps unsurprising that the interns did not prioritize developing these skillsets further, especially since there was an uncertain payoff to such effort. As students are still developing their early vocabulary for their discipline, there is the opportunity to integrate practical skills with GAI such as prompt engineering, iteration on generated content, and critical evaluation of content quality into courses that teach similar skills (e.g. media history, iterative design, and critique).

7 CONCLUSION

What GAI in the games industry looks like in ten or twenty years is surely a matter of speculation, yet it is important to document the bottom-up efforts in the games industry to build sensibilities, attitudes, and skills of a new professional culture. In this paper we described a study of Mass Digi's 2023 Summer Innovation Program, where game development interns were encouraged to use generative AI tools to assist the process of developing mobile games. We found that despite the hype around GAI in creative industries, the adoption of GAI into game development in this program was not straightforward. The interns resisted, negotiated, and reimagined GAI as they learned to navigate the changing game design landscape. While programmers hesitated to integrate GAI tools into their workflow initially, their viewpoint of the technology shifted when they found practical, easy-to-implement methods to leverage specific tools in support of their typical workflow. The artists, on the other hand, grappled with more nuanced challenges; the GAI tools available at the time for artists were focused on generating the final artistic product, which the interns struggled to integrate into their process without dramatically changing how they work. These artists, however, expressed positive attitudes regarding hypothetical GAI tools that contributed to their workflow rather than replacing it.

We argue that it is critical the community take early career professionals' skepticism seriously, especially as their resistance was primarily a response to their need to navigate the changing game design landscape. When the interns expressed their skepticism, their ethical commitments to fellow game developers and the future of their profession were as important as their practical concerns about usability, utility, and efficacy of GAI tools. As the interns were looking for ways to make GAI work for their design process (instead of subsuming their design process under GAI functionalities), they were actively building components of an emerging professional culture both *with* and *against* GAI. This new culture blends the pragmatism of tool use, the ethics of professional belonging, and the creative agency of the developer. We see in this emerging culture an implicit concern for a future that diverges from prevalent corporate talk around AI. Our analysis of the research findings thus end with a framework for how to productively engage with the implications of this emerging culture in the larger game development community and game education in higher education institutions.

7.1 Limitations and Future Work

The scope of the study was limited to this particular program; though it draws students from a number of disciplinary contexts and from different institutions, this is only a snapshot of a much

larger, international cohort of university students preparing to enter the games industry. The interns were not required to use GAI, so it was not possible to gain insight into reactions to GAI beyond the reasons for their continued resistance to the technology. And, since the SIP strongly encourages interns to make games that fit an existing mobile genre (for scoping reasons, as the games must be published at the end of the program), we have no insight into their perceptions or interest in using GAI as a mechanic or in support of player experience [43]. Additionally, our investigation and use of the term 'GAI' is limited to the GAI uses found in the program. For example, the interns did not use video generation tools, and there was only one intern who was responsible for audio content. Furthermore, an investigation of this program cannot provide a complete and clear assessment of the state of GAI tools in the games industry, where development projects face commercial pressures, extended project timelines, and a professional environment that is not specifically designed to facilitate personal or collective growth.

It is our hope that our study can prompt additional inquiry into the nuances of GAI and the nature of resistance to its usage in early professional communities, especially as it relates to interdisciplinary contexts with different GAI usage patterns and interests. It would also be interesting to explore the integration of more context-dependent GAI software, especially in the arts, as new software becomes available that better aligns with artists' existing workflows becomes available. Finally, we are conducting another study of the use of GAI tools in the games industry within well-established game development processes at professional studios as an extension of this research.

ACKNOWLEDGMENTS

This material is based upon work partially supported by the National Science Foundation (NSF) under Grant No DGE-1922761. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the NSF. We would like to thank Monty Sharma, Tim Loew, and all of the participants of MassDigi's 2023 Summer Innovation Program.

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