The Transformative Experience of Game Jams: How Game Making Improved Perceived Social Issue Understanding

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Abstract

This case study investigates the value of game jams in enhancing the understanding of social impact topics, in addition to their well-documented benefits for learning technology and design. Unlike traditional game jams focused on developing game design skills, this study explores how participants' perceptions of both the game-making process and the selected social impact topics evolved. Given that game jams often center around specific themes, the insights from this research can guide the organization of future game jams, emphasizing their role in fostering deeper reflection on various social issues. The study aims to position game jams as a reflective educational tool, comparable to writing papers, creating videos, or other common educational activities. The findings from a 48-hour game jam involving 76 participants, primarily female-identifying with an average age of 21, indicate that the event significantly enhanced their perceived understanding of game design and deepened their knowledge of social impact topics. These results support the idea that game jams can broaden participants' knowledge beyond just game design and implementation.

Keywords: game jams, social impact, social interventions, game design, evaluations

1. Introduction

Game jams are collaborative events where participants come together to create games within a short, fixed time frame, typically ranging from 24 to 48 hours. These events have gained popularity in the fields of game development, education, and social impact due to their unique ability to foster creativity, teamwork, and rapid prototyping. Research on this domain has existed for at least two decades (Lai et al., 2021) with case studies analyzing specific content (Grace, 2018), jam organizers (Kultima, 2018), process (Mikami, 2016) and even the meaning of the term game jam across academic publications (Kultima, 2015). While many game jams focus on topics like improving game design and development skills (Hrehovcsik, 2016), the thematic foci of these events include health communication (Preston, 2014), cross-cultural collaboration (Park et al, 2023) and even quantum physics (Piispanen et al, 2023). Such jams focus on helping participating community members through addressing inequity (Fowler and Schreiber, 2017) toward wider applications of learning in more general jams like the Global Game Jam (Fowler et al, 2013) and more. While play is often the discerning difference between game jams and hackathons (Grace, 2016), such activities have historically been used for learning and teaching (Meriläinen,2018). As evidenced by the variety of approaches and foci for game jams, there is clearly no one way to jam (Richard, 2016).

Given this precedence, the researchers organized a game jam aimed at exploring social impact designs for both digital and analog games. The subdomains of social impact games include broad topics like persuasive games (Bogost, 2010) to nuanced interventions in health and well-being interventions (Johnson, 2016). It is common in this domain to aim toward creating real world impact in players through playful experiences. While this work does not involve the first game jam to focus on social impact, it offers new perspective by involving complex design challenges with participants who are generally new to both game design and social impact games.

The primary motivation behind this work is to explore how individuals with limited experience in game jams can benefit from participating in such events, beyond merely combining social impact with playful experience design and learning game design. In short, the work provides insight into the perceived benefits of game jam naïve participants to the jam process and its outcomes. This work focused not only on what can be considered the overt benefits of such experience (i.e. learning about game design and development) but also the non-overt (i.e. learning about the topics on which the

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games are based). The research aims to extend the widely understood benefits of game jam for practicing the work of making games to a wider understanding of the varied topical foci on areas like social issues. While the bulk of research on game jams focused on game design and development related outcomes (Aurava and Sormunen, 2023), there has been some research into the non-game focused outcomes of games on jammers sense of preparedness (Miller et al, 2019) or to help evaluate wicked problems (Ot1 et al, 2021).

To support a deeper understanding of participant outcomes, the authors hosted and researched a social impact focused game jam at Anant National University in India in 2023. The event drew 76 participants from the university and surrounding communities. These participants were volunteers and did not receive monetary compensation for their efforts. Instead, they were provided with food, workspace, access to technology, and feedback from both institutional and guest faculty.

Of these 76 participants, a subset of 24 game jammers, participated in an additional pre-event training workshop held over the three days preceding the main event. This workshop provided undergraduate students enrolled in interactive media and user experience programs with a fundamental introduction to social impact game design. The three-day workshop combined hands-on instruction in game design theory with practical training in game implementation using Twine (2009) and GameSalad Creator (2009). This training employed the social impact game design theory and practical approaches given in the book Doing Things with Games (Grace, 2019). This theory of impact employs a game verb-centered approach which frames social impact games as problems paired with designer prescribed solutions. Those participants who had experienced the training, were encouraged to frame any social impact topics of their choosing toward a problem-solution pairing that would work both in interpreting the social-issue they had chosen and in designing the game.

For this subset of participants who underwent training, foundational principles of analog and digital game design were delivered in a workshop format. This training included 3 hours of daily classroom instruction and 2 hours of assigned independent and group work. The participants in this subset generally had limited prior experience with game design and exhibited mixed attitudes towards it. During an informal poll conducted in the training session, less than half of the participants indicated that they voluntarily played games in their free time.

The remaining 51 participants did not undergo the preliminary training. Their experiences with game design, social impact games, and interventional experience design were diverse, as indicated by the pre-survey test. These participants were invited from the local university community beyond the workshop participants, other local universities, the nearby independent game-making community, and the wider state of Gujurat. The game jam was residential, providing meals, bedding, and dedicated workspaces for all participants on site.

All participants were asked to voluntarily complete a pre- and post-survey. They did not receive any compensation for their survey responses, and all data collection was conducted anonymously through an online form shared only with the game jam participants. The post-survey was provided prior to any evaluation of the work produced. The jam and surveys were conducted in English with an English-speaking community.

2. Results

2.1. Pre-Survey Results

51 respondents, or 2/3 of the total jammer population, answered the voluntary survey. Their self-reported mean age was 20.78. The age range between the youngest and oldest participants was exactly 10 years, with 18 as the youngest 28 at the oldest. The minimum age to participate in the jam was 18. The mean age of game jam participants globally seems to be in the 18-24 age range, with the second largest group in the 25-30 group (Steinke et al., 2016). As such, the population, by age, seems an appropriate comparator to an average game jam, and not merely the result of the jam being hosted on a college campus.

The event was also predominantly comprised of female participants, with 64.7% identifying as female, 33.3% identifying as male, and the remainder self-reporting as other or preferring not to disclose. Again, given that the jam was held on the Asian continent the female majority falls in line with the largest scale global demographic comparison of jam participants, where female majorities were noted in jam populations in Asia and Oceania (Steinke et al. 2016) and rarer in the Americas and Europe.

In terms of educational attainment. Self-reported educational levels included 47.1% that had completed high school, 21.6% that had some college education, 29.4% that had earned a bachelor's degree, and the remainder had completed a graduate degree or pursued further education. This indicates a mix of college-age and older participants.

Regarding prior experience with game making, 58.8% of participants reported having "no prior experience." Meanwhile, 35.3% indicated some "experience as students studying interactive media or games." Additionally, 11.8% had independent game-

making experience through non-school projects, and 9.8% identified as hobbyists. No participants indicated that they were “Professional - I have been employed in game making.” These categories were not mutually exclusive; for instance, a respondent could have experience both as a hobbyist and through school projects.

Overall, 60.8% of participants had never been involved in game making before the event. 31.4% had less than one year of experience, and 7.8% had between one and three years of experience. Response options, included, “between 3-5 years” and more than “5 years.” Notably, no respondents had more than three years of game-making experience, indicating that no participants could be considered mid-career or experts in the field. Furthermore, 94.1% had never participated in a game jam prior to this event, with only three participants (5.9%) having taken part in a single previous jam elsewhere. In short, this population was primarily game jam naïve, new to game design and development.

Participants were asked to identify their motivation as non-mutually exclusive categories; required for class or study, interesting in participating in the game industry, interested in learning about game jam, interested in developing specific skills, for fun. The most common motivation for participating in the game jam was an "interest in learning about game jams," selected by 58.8% of participants. Additionally, 52.9% expressed an "interest in participating in the game industry," while 49% aimed to "develop a specific skill." Furthermore, 41% of participants joined "for fun," and 21.6% indicated that participation was "required for a class or study." These motivations were not mutually exclusive, allowing participants to select multiple reasons for their involvement.

Travel distances provided further insights into effort and participants' motivations. A significant majority, 68.8%, traveled less than 25 kilometers to attend, while 20.8% traveled more than 50 kilometers. The remaining 10.4% traveled between 25 and 50 kilometers. While the bulk of the participants were relatively local, the group was reasonable split between localized participants and participants beyond a commutable distance. The jam was residential, so participants slept in furnished spaces during the jam period.

Regarding group dynamics, the majority of participants, 78.4%, planned to work in groups of four, with the second largest group, 19.6%, working in groups of three. One participant indicated planning to work alone. No groups larger than 4 were planned, which aligns with the game jam setup which placed participants in groups at the start.

When asked about their intended roles within their teams, 64.7% of participants planned to be designers for their projects. Meanwhile, 17.6% aimed to be developers responsible for implementing the game, 9.8% planned to manage or produce the project, 5.9% identified as artists, and 2% intended to focus primarily on other categories, such as audio design and production.

Technology decisions made before and after development can provide an objective view of the progression of the implementation process during the game jam. When participants, especially novices, abandon specific technologies or face implementation difficulties, it often indicates challenges in the implementation process. Out of the respondents, 48 were comfortable communicating their planned technology usage for game implementation. Game implementation software, which might include the use of a game engine, was contrasted with creative software, which may be used to create assets for a game or in the design process.

Predictably, the most recently trained technology, GameSalad Creator (2009), had the highest planned usage ratio at 58.3%. Additionally, 33% of respondents indicated they would not use a game engine at all, opting instead for custom code or non-digital games. Twine (2009) was the third most planned technology at 20.8%. Other commonly used tools included the Unity game engine (2006) at 10.4%, the Unreal game engine (1998) at 12.5%, and GameMaker (1999) at 8.3%. Individual participants also reported planning to use Figma (2016), Spline (2020), Scratch (2003), and GDevelop (2008). Notably, the historical age of the development tool did not correlate with its planned use, indicating that participants may have chosen tools based on participant familiarity, especially when consider that software was chosen before starting the project and with limited or no experience with game-making or jamming.

It is also worth noting that at the start of the jam, 48% of respondents had not decided whether they would create an analog or digital game. Meanwhile, 18% planned to create an analog game, 16% a digital game, with the remainder considering a blend of both digital and analog elements.

For creative software, the Adobe suite of software had the most common planned usage, with free and open-source solutions as the third largest group. Adobe Photoshop (66%) and Adobe Illustrator (66%) lead, with an “other” category (55.3%) in third. Participants offered answers in the “other” category included Unreal Engine and Game Salad, among lesser-known free tools. That game implementation tools were offered as other options in the game implementation software list, may be an indication of misunderstanding the distinction between technologies or a problem in survey design.

Participants' sentiments regarding both game design and their selected social impact topics were

collected. Among the participants, 15% reported understanding game design "very well," 74% "somewhat well," and 9.8% claimed they "didn't understand game design at all." Regarding their chosen topics at the start of the game jam, 11.8% felt they understood the topic "very well," 86.3% "somewhat well," and 2% "not at all." The topics varied from general issues such as land usage politics to specific problems like child brides, understanding depression, or supporting high-anxiety student peers. Notably, given the freedom to select any social impact topic, participants predominantly chose subjects with which they were neither entirely unfamiliar nor very familiar.

2.2. Post Survey Results

Participants were requested to complete a post-game jam survey immediately following the conclusion of the game jam. Importantly, the survey was made available prior to meaningful feedback sessions and recognitions as part of the closing jam ceremony. Participants were not given feedback about their work before they completed the survey. All but one response was submitted within the first hour of the survey's availability, indicating that the post-survey results were collected very early to the conclusion and before participants could observe the final work of their peers and colleagues. It is thus hoped that the responses are not influenced by peer reflections. Obviously, they may have been shaped by the inevitable fatigue of working for an intense 48 hours withing a group, both exploring a social issue and aiming to implement an experience for others to play.

Out of the initial 76 participants, 42 completed the post-jam survey. Two of the original 76 participants left before the jam was completed to tend to personal emergencies. Given this, the post-survey response rate was approximately 57%, compared to a 67% pre-survey response rate. Given that there were 42 participant responses, the researchers feel the number offers an appropriate, if not ideal, pre-post comparison.

To facilitate comparison with the pre-survey, certain variables were reused between pre and post surveys to ensure continuity between the test groups and the survey results while maintaining anonymity. This was particularly important given the population's social proximity to the hosting institution and the potential employment network. The researchers wanted to the respondents to be protected by anonymity not only for the privacy, candor and veracity in research, but also in any future or existing relationships they have to the hosting institution it's faculty and their evaluators.

The mean age of participants in the post-survey increased slightly to 21.1 years from the original 20.78 years, likely a product of the decrease response rate and missing participants. The gender distribution of pre-survey and post-survey participants remained consistent, with a majority of 64.3% female respondents. The educational attainment of respondents also showed a modest increase, with 52.4% having completed high school compared to 47.1% previously. This shift is reasonable given the very slightly increased age and sample size.

Team sizes also remained similar, with 81% of post-survey respondents working in groups of four and 19% in groups of three. This meant that that participant generally remained in their original teams. Given these minor changes across key population variables, the researchers are confident that the comparison between pre-survey and post-survey participants is justified.

Central to the aims of this research, Respondents were asked two essential questions. First, "do you feel you understand the fundamentals of game design better after participant in the jam?" Given a 3-value scale range, 50% responded "very well", 47.6% responded "somewhat well" and a single participant (2.4%) indicated "not at all." When asked if they feel they understand the topic on which they completed a game, 66.7% indicated "very well. The remaining 33.3% indicated "somewhat well."

3. Results and Observations

3.1. Social Issue and Game Design Understanding

Several significant observations can be made from the data collected. Foremost among these is the marked increase in participants' understanding of the social impact topics they chose to explore. Participants selected a wide array of disparate topics, ranging from land use politics in the context of climate change to increasing empathy for individuals suffering from anxiety. Importantly, none of the teams included subject matter experts on these topics. Consequently, participants were required to conduct research, explain these topics to one another, and design gameplay systems around them. Notably, no team altered its social impact focus during the game jam.

Within the constraints of a 48-hour game jam, participants experienced a complex set of educational activities. Observationally, participants not only dedicated time to understanding the combinations of problems and solutions within their chosen foci, but also endeavored to explain these concepts to each other and subsequently design a system for gameplay. While all of this work was ostensibly undertaken to create narratives and systems chosen by team members, it is important to note that not all team members shared the same passions

and aims concerning social issues chosen. Participants were grouped before they selected their topics, suggesting an opportunity to foster educational experiences across different areas of interest through the game jam.

As illustrated in Figure 1, participants exhibited a significant shift in their perceived understanding of the social impact topic they worked on. Broadly speaking, from the start to the end of the game jam, participants were five times more likely to report that they understood their chosen social impact topic "very well."

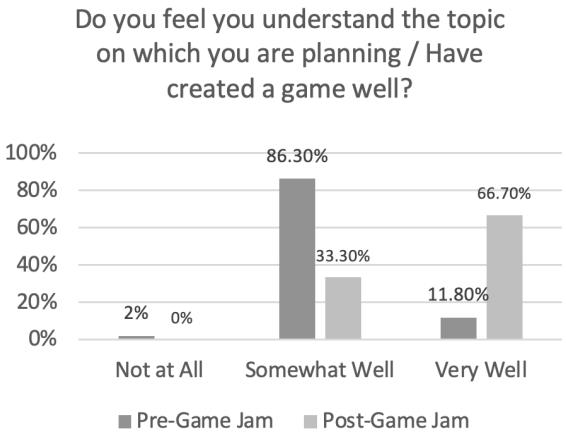

Figure 1. the transition in participant perceived understanding of chosen social impact topics

This shift is even more remarkable when compared to the self-reported change in understanding of game design, as shown in Figure 2. Although game design was the primary objective of the 48-hour jam, participants indicated a more significant improvement in their understanding of the social impact topic than in the task they were ostensibly more engaged.

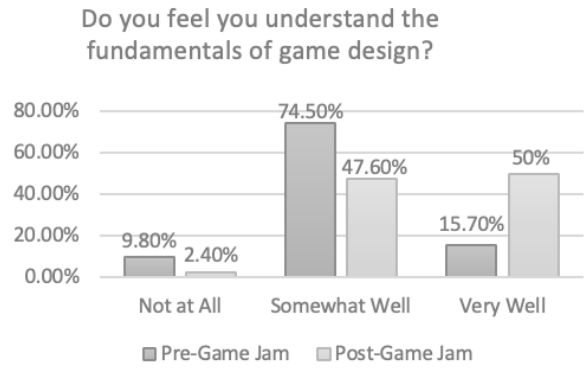

Figure 2. the transition in participant perceived understanding of game design

This finding is particularly intriguing when contextualized by the timing of the survey. Amidst the process of creating games for the jam, respondents generally reported a more substantial increase in their perceived understanding of social impact topics compared to their understanding of game design. Although the primary focus of the event was on game creation, participants demonstrated a more significant enhancement in their comprehension of the social impact topics than in their game design skills. It is also noteworthy that the questions regarding these two areas were asked independently and not in relation to each other.

This shift in understanding is further amplified by the participants' motivations. According to the pre-survey, over half of the participants were motivated by an interest in the game industry (52%) and a desire to learn about game jams (58.8%). Additionally, almost half of the participants were interested in developing specific skills. This indicates that their primary motivation for attending the jam was not to learn more about a chosen social issue topic. However, the most evident educational shift occurred in their understanding of the social impact topic, rather than in the refinement of their game design and related technical skills. From an educational perspective, it is plausible that to design an effective game, participants felt it necessary to thoroughly understand the topics they were addressing.

This finding is a valuable addition to the value of game jams, in which a team of game-makers may acquire a deeper understanding of the topics on which they are creating work to further the development of their game. It implies that instead of merely developing skills in game design and development, the jammer is also developing a deeper understanding of the foci of their game. Such results hint that there is opportunity in encouraging deeper engagement with social issue through the lure of game jamming.

3.2. Shift in Responsibilities

The third finding from the pre-post survey is perhaps less surprising than affirming. As has been noted in the past, the learning experience of jamming, especially among new jammers, means that there are likely shifts in roles and responsibilities of participants as the jam develops.

As illustrated in Figure 3, it is evident that many participants shifted from their initially planned responsibilities to create a more balanced game-making team. The data reveals significant rebalancing of team efforts, with the most substantial shifts occurring in the areas of art and production. Specifically, there was a 63% increase in participants responsible for art, a 32.2% increase in those handling management, a 25% increase in development and implementation responsibilities, and a 12.3% increase in other roles. It is often the case in such contexts that many participants initially envision

themselves as designers, but the practicalities of game implementation necessitate the application of their skills in other areas. Notably, design roles also saw an increase, which is likely when teams engage in cooperative design processes.

Either way, the plausible thesis that the challenge of game design may have driven participants toward learning more about social issues than practicing implementation is somewhat invalidated by these shifting roles. Instead of teams turning away from the complexity of implementing games, they turned toward them, shifting toward learning and adapting skills like team management and art production, rather than applying more human resources toward subject matter expertise, research or development. This is particularly underscored, when, for example, this audience had access to generative artificial intelligence art tools but elected to produce art without it. Such evidence hints that challenges arose more from mapping social issues to game design, than in the implementation itself. Instead of simplifying the social issue to fit an easy implementation, the teams seemed to aim toward higher quality address of the social issue.

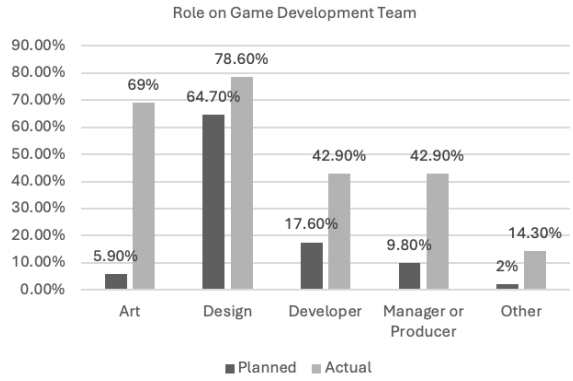

Figure 3. Graph illustrating the planned and actual responsibilities on the game development team

From these results it is also plausible that participants utilized software with which they were already familiar. This assumption is supported by the prevalent use of the Adobe suite of software, which is integrated into the curriculum of students and alumni of the hosting institution. Interestingly, there were diverse choices in implementation, encompassing both digital and analog solutions. For participants who created board games or digital games, mainstay image manipulation tools from the Adobe suite were widely used. Additionally, specialized software such as the Unreal Engine and AutoCAD proved useful for virtual reality implementations and 3D-printed solutions, respectively. Notably, of all responsibilities shift, there was a sharp contrast in planned artmaking and the reality, with many more participants responsible for artmaking than expected. Again, this may hint not at challenges in making the game, but in attempting to portray the social issue.

3.3. Qualitative Feedback

The entire general responses from all participants as entered in an additional comments and feedback section of the post-survey provided an opportunity to collect thoughts and feelings from the 43 participants that completed it. 40 of the respondents provided this qualitative feedback, with only 3 refraining from comments at all. To maintain anonymity and provide these findings, the researchers obtained a summary of all comments using ChatGPT 4 artificial intelligence with the prompt, "please summarize the following comments into positive and negative paragraph". It is noted that there are some short fallings with such AI-assisted qualitative summary. However, the researchers found through manual review that these summaries reflected the general sentiment express in the original statements.

The summary of qualitative feedback was interpreted as the following:

Positive Comments:
Participants expressed a lot of excitement and encouragement from the college, which was a pleasant experience compared to their own institutions. External teams felt well taken care of and expressed a strong desire to return for future events. Many enjoyed the challenge of putting their skills to the test and found the experience amazing, including those who participated in their first hackathon. The social impact factor was appreciated, and the event was seen as a valuable opportunity for learning, brainstorming, and receiving constant feedback. Participants enjoyed the teamwork and found the challenge to be inspiring and educational, with a lot of fun and new experiences. They appreciated the support and facilities provided, and the event's duration was seen as a chance to push boundaries and explore new limits. Overall, the experience was memorable, providing good exposure to team management and game design under time constraints. Faculty members, especially [anonymized], were acknowledged for their guidance and inspiration. Participants found the event thrilling and expressed eagerness to participate in future challenges.

Negative Comments:
Some participants felt that a 24-hour or 72-hour challenge would be more interesting compared to the

48-hour format. The extensive documentation requirements were seen as time-consuming and detracting from the main objective. There were suggestions for more flexible printing services, such as laser cutting. Some found the event rigorous, exhausting, and stressful. Technical glitches during the game jam prevented the proper execution of the interface experience. Idea clashing within teams was mentioned as a drawback, although teamwork was also highlighted as a positive aspect. Participants suggested that documentation submission could be scheduled after the event to avoid time pressure during the jam. Overall, while the experience was enjoyable, the duration of the jam was seen as slightly longer than expected, contributing to the exhaustion.

Notably from this feedback jam operations and the game design task were foremost in the free-form response of the participants that provided qualitative observations. The respondents did not emphasize their increased perceived understanding of the social issues on which their designs were based. This may imply that such shift was not obvious to participants, or perhaps not as obvious as what they learned in game design and implementation or the operational challenges they experienced.

This may indicate that such benefits of jams may contribute to a kind of covert learning. Toward the paper's primary conclusion, the participants noted where frictions in the experienced existed, but did not perceive increased understanding of their specific social issues as one such challenge. They note for example, the positive experience and low friction experience provided by the hosts, save for the need for process documentation and other jam requirements. They emphasized the challenges in time and aimed most of their positive and negative critique at localized problems in game implementation (e.g. printing and laser cutting delays), not the challenge of identifying, understanding and addressing a social issue. The responses even identify the increased perception of the value of team management, but the evidenced increase in perceived understand of social issues is almost hidden in qualitative response.

8. Future Work

The analysis of these findings suggests missed opportunities to gain a deeper understanding of the learning experiences in this and similar game jams. While the central question concerning social issues is clearly evidenced, future work also offers the opportunity to determine and rank how other elements of such jams shift through the experience. Beyond the balance of implementation elements, the qualitative data seems to hint at an increased appreciation of team management, an unplanned role that several participants adopted.

There are several post-study areas of improvement readily admitted by the research team. Most notably, the use of an intra-survey identification system would have allowed the researchers to track the per-participant transition. This would have allowed for more fine-grained data, indicating how individual experiences, understanding and choices transitioned though the game jam. The survey also lacked follow-up questions about primary motivations in the post-survey. It would have been valuable to ascertain whether participants' motivations regarding their social impact topics evolved. Questions such as, "Did the jam alter your commitment or interest in your social impact focus?" would have provided very useful insights.

Additionally, there is significant potential for further investigation into the relationship between individual participant experiences while maintaining anonymity. A primary area for future research includes examining the differences between participants who received game design training during the three-day workshop prior to the jam and those who did not. Since the workshop did not involve training participants on specific social impact topics, it is unlikely to be a significant variable in the observed increase in perceived competency in those topics.

Maintaining participant anonymity also presents challenges in understanding the correlation between technological complexity and perceived comprehension of social impact topics. Furthermore, it would be beneficial to explore how the experiences of participants who created digital games differ from those who created analog games. Specifically, research could address whether one process affords more or less time for deepening understanding.

As is often the case in such research, more detailed and comprehensive surveys could yield more informative data. However, this must be balanced with considerations of volunteer response rates and fatigue, particularly following an intensive event like a game jam. At a minimum, it is hoped that this work contributes to the evolving understanding of the benefits and outcomes of game jams. The research team is optimistic that these results bode well for future studies and applications in this field

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