

Jamming Together: Breaking the Gender Barrier in Game Jams

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ABSTRACT

Despite the growing number of female gamers, their participation in game jams remains disproportionately low. This research seeks to understand and address some of the underlying barriers that prevent women from fully engaging in these events, often dominated by male participants and shaped by a masculine culture. Building on a 2019 study conducted in Brazil, this research replicates parts of the survey at the 2023 University of Malta Game Jam while incorporating qualitative questions, to further explore participants' motivations, experiences, and perceptions of game jams. The study found that 62% of participants were attending their first Game Jam and the primary motivators for both genders were learning (85%) and taking on a personal challenge (82%). A clear gender disparity was noted in role distribution during game development, with female participants primarily assuming creative, design-focused positions and male participants predominantly leading in the technical programming roles. 55% of the participants, the majority of whom were women, had witnessed or heard of situations where women felt uncomfortable during the event, with many citing hostile environments and technical insecurities as significant deterrents. On the positive side, 85% of all participants perceived the event as a valuable learning experience and 65% enjoyed the competition. However, only 30% of women saw it as a place to foster friendships, compared to 76% of men. Female and Male respondents had similar and diverging suggestions on how to make game jams more inclusive. These results highlight the need for targeted initiatives to foster a more inclusive and supportive environment within game jams. However, this may be challenging due to the differing experiences of women and men.

Keywords

Gender stereotypes, Game jams, Gender Equality, Inclusivity, Game Development

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INTRODUCTION

A Game Jam is a play on the idea of a musical jam session, where participants improvise and create new music. In Game Jams, participants are asked to rapidly prototype a game, either online or on-site, during a short, intense, time-bound event which usually centres around a specific theme, at the end of which the results are typically shared (Kultima, 2015). Game jams can be categorised under three broad areas: Indie, Industry and Academic game jams (Goddard, Byrne & Mueller, 2014). These all have common elements that overlap but also come with their specific context and culture, which must be considered.

The multidisciplinary nature of game development often brings together individuals from various backgrounds, such as IT, art, music, research, academia and creative writing, who collaborate and usually work around the clock to meet the set challenge. Whilst having computer skills is helpful in such events, people without technical IT skills can contribute to such game jams by bringing different knowledge and expertise. However, many erroneously assume that such events are only open to technologically savvy individuals with high IT skills. This contributes to the exclusionary nature of game jams and the gendered idea that these game marathons are the exclusive domain of male computer geeks. This is problematic because game jams help develop multiple skills, including critical thinking, problem-solving, timekeeping, networking, generating ideas, communication skills, IT skills and portfolio development. Kennedy (2018, p.720) describes game jams as 'rites of passage' that can provide an introduction to game design and development (Hrehovcsik, Warmelink & Valente, 2016) within an expanding industry (Georgiev, 2024, January 2).

The University of Malta has organised a yearly Game Jam (GJ) for the past decade. During the 2023 edition, held at the University of Malta, 90 students participated in the three-day event utilising the Unity Game Engine. Of these, only 32% were females. This is not surprising because, in general, most Game Jam participants tend to be males (Aurava & Meriläinen, 2022; Ferraz & Gama, 2019) and based on the personal experience of one of the authors (Dingli), this was also consistently observed in Malta during a ten-year period. This pattern suggests that gender hurdles exist, meaning females tend to lose out on game-jamming opportunities. This lacuna is also noted in the world of work, where, for example, in 2024, only around 23% of the game developers were female across the globe (GDC, 2024, March 18–22). These sobering facts call for a better understanding of hurdles leading to a lack of gender diversity in game jam participation, and the analysis of game jams through gender needs further exploration.

1.1 GENDER ISSUES IN THE VIDEO GAMING CULTURE

Before focusing specifically on the gender aspect of game jams, it is imperative to note that the broader culture of video gaming is masculinised. The evolution of gender disparities in gaming reflects a complex and shifting landscape shaped by sociocultural, economic, and technological forces (Newman, 2017). By the mid-1980s, video gaming had become increasingly associated with masculinity—a transition largely driven by industry practices and gendered marketing strategies aimed at consolidating a male consumer base (Kirkpatrick, 2017; Derr, 2020). This masculinisation of gaming culture coincided with a marked decline in the number of

women enrolling in computer science programs, as the personal computer and gaming markets increasingly targeted male users (Derr, 2020). These gendered dynamics continue to shape the gaming industry today, where women remain underrepresented in game development roles and frequently encounter systemic barriers to participation and advancement (Bailey et al., 2021; Valdés-Argüelles et al., 2024).

In the techno-cultural networks, hegemonic masculinity is valorised over 'sissy stuff' linked to women (Jenson and De Castell, 2018) and men in gaming are assumed to be the norm because of their presumed higher competencies. Perceptions of inferior competence in women in gaming are still prevalent, especially at the higher 'expert' level (Kelly, Nic Giolla Easpaid, Castillo, 2023). In these circles, women tend to be judged more harshly because of their gender rather than because of their competencies. Whilst the percentage of female gamers has reached 41% (Howarth, 2024), three out of four female gamers choose to disguise their gender when playing online to avoid sexism and sexual harassment (Sacco, 2022). Sexist practices, including ridicule, bullying, sexual harassment and, at times, violence against women, prevail in the online 'toys for boys' gaming world (Kelly et al., 2023).

So, what happens to women in the real-world environment during game development marathons? Do the same values prevail? Or is it a more positive experience for female game jammers?

1.1 Stumbling blocks that discourage greater female participation in Game Jams

As argued earlier, game jams primarily attract male groups and tend to conjure up images of "pizza-and beer-fuelled highly competitive and intense activities" (Kennedy, 2018, p.710). These can become hostile places for women and stop them from participating in such events. The hostility can take various shapes and forms, including mansplaining, where men tend to interrupt women to explain something they may already know or understand in a condescending or patronising way, and/or Bropriating where women's ideas are first dismissed only to be taken up by others (typically men) in positions of power (Paganini et al., 2021)

Women may also avoid such events because they doubt their technical abilities, which they assume to be fundamental to game creation (Harvey & Shepherd, 2017). Whilst doing so, they may internalise this as an individual failure rather than seeing it as a gender issue that needs resolving in line with feminist goals (Gill, 2002).

To overcome the gender hurdles, there were attempts to introduce female-only game marathons. Kennedy (2018), who explored all female games jams over several years in the UK, noted that while these may be considered as being segregationist and problematic by some, they also bring benefits that avoid 'the systematic abuse reported by female players, makers, or commentators in the sector'. She argues that these could also lead to a safer ludic space, which is less intimidating for female participants and can contribute to confidence building that can have an informative and transformative nurturing effect on their lives. Myerscough, Eberhardt, Jakobsson, & Lo (2017), when focusing on the issue of inclusivity in game jams, found that

increasing female participation and involving designers known for inclusivity helped maintain focus on these issues. However, this may have marginalised other participants less inclined to advocate for equality between women and men.

In their study on game jams held in Brazil in 2018, Ferraz and Gama (2019) noted that collectively, their participants indicated a low percentage (9%) of game jam participants who believed that females and males are treated equally in their work teams in ICT companies. A similar response (10%) was noted regarding the gaming industry. However, the collective response increased to over 30% when explicitly asked if women and men are treated equally in their work teams during game jams. When digging deeper and analysing their responses by gender, the female respondents showed a more significant concern, and 50% indicated they disagreed that women are treated equally in their work team in game jams. Looking at the responses of male respondents only, the number of males who believed that there is equal treatment during game jams shot up to over 81%, and only a tiny minority of males (18%) thought there was inequality during game jams. This suggests that being in a context which is traditionally associated with males, and where males predominate, it may be more difficult for them to perceive and understand any gender bias against women during game jams, and even if they do, they seem less worried about it than female participants (Ferraz & Gama, 2019).

When analysing factors that could discourage anyone from attending game jams (Ferraz & Gama, 2019), it was noted that performance insecurities and lack of confidence were more likely to affect female participants than male participants. Building on Ferraz and Gama's research on female participation in game jams in Brazil held in a pre-Covid environment in 2018, this paper seeks to replicate the survey in a post-pandemic setting in Malta. It aims to assess the similarities and differences observed using the gender lens concerning the motivational aspects and the stumbling blocks observed in these two different contexts during different periods.

2 METHODS, PARTICIPANTS DESIGN AND PROCEDURE

The research method, participant design and procedures adopted by Ferraz & Gama (2019) were employed to study gender dynamics at Game Jam events in Malta. Additional questions were added to the Maltese survey. For this reason, not all data points are directly comparable due to missing data from the 2019 survey. The aim was to probe deeper into the experiences, motivations, and perceptions of gender issues within these events, mainly focusing on inclusivity, teamwork, and the presence or absence of gender biases in game development.

The demographic makeup of the Game Jam in Malta comprised 90 participants, with a survey response rate of 73%; 66 individuals participated in the post-event survey. Of these respondents, 33% were female and 67% were male. The participants included students from the Faculty of Information and Communication Technology and the Faculty of Media and Knowledge Sciences (MAKS) at the University of Malta. Since there was an imbalance in the dataset and considering the size of the dataset, we chose the Oversampling technique (Mujahid et al., 2024), which involves replicating female responses to match the number of male responses. This can help in balancing the dataset without losing any male reactions. However, it can lead to overfitting due to repeated data. The Brazilian Game Jam recorded 283 registrations.

Before targeted gender-specific advertising, the demographic was predominantly male (84.5%) and 15.5% female. Post-campaign, the number of female registrants surged significantly, indicating the effectiveness of targeted outreach in enhancing gender diversity. The final registration breakdown for Brazil was 76.3% male, 23% female, and about 0.7% opting not to disclose their gender.

Both surveys were conducted right after the closure of the Game Jams to capture fresh and immediate feedback. They included quantitative and qualitative inquiries aimed at understanding the varied dimensions of participation – reasons for joining, perceived benefits, competitiveness, teamwork, gender issues, and perceptions of gender-based discrimination in gaming.

The survey data was subjected to a rigorous analytical process. Quantitative responses were statistically analysed to discern patterns, trends, and notable disparities in gender experiences and perceptions. The qualitative data, gathered through open-ended responses, provided nuanced, personal insights into the participants' subjective experiences and opinions, enriching the understanding gleaned from statistical analyses. The qualitative data was analysed following Braun & Clarke's Thematic Analysis approach (2006) using NVivo software.

In terms of ethical considerations, the research upheld stringent standards as per university regulations. Participant anonymity was a key focus to ensure genuine and unbiased responses. Informed consent was an integral part of the process, with participants briefed on the study's aims, their voluntary involvement, and the use of gathered information. This approach was crucial in upholding the ethical integrity of the research, ensuring participants' privacy and respect for their autonomy. Furthermore, ethical standards in survey research necessitated the protection of participant data. This involved secure data handling, storing only relevant information, and using the data solely for the intended research purposes. The researchers also avoided exerting undue pressure and ensured that participation was voluntary. Participants could withdraw at any time without facing any repercussions.

3. RESULTS OF THE MALTESE GAME JAM

Demographics – Gender roles adopted during the game jam

When assessing the primary role adopted by the female and male respondents (66) during the Game Jam, out of 21 female respondents, around half indicated (11) they were artists, eight were programmers, one was a project manager, one was Game Designer, and one listed herself as a UX designer but also an artist. On the other hand, out of 45 male respondents, the majority (31) indicated they were programmers, followed by six whose role was a Project Manager, three game designers, three artists, one musician and one who said he was all the combined roles. This shows a significant disparity in the roles assumed by female and male participants, with most females gravitating toward artistic roles associated with game development's creative and design-oriented aspects. In contrast, males predominantly occupied more technical, programming-related roles.

Motivation and experience during the game jam

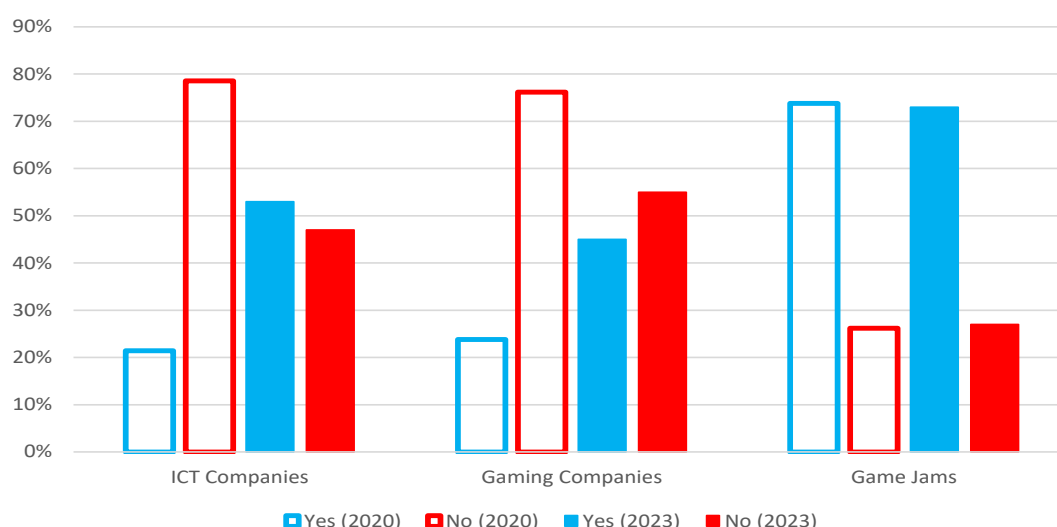
For 62% of the participants in Malta [38% Female, 62% Male, 0% Other], this was their first game jam, and they had yet to form their expectations for the event (apart from the briefings provided). In most cases, this was also the first time they had to work in a mixed group, not just in terms of gender but also in terms of expertise.

Regarding motivations for participating in the Game Jam, the survey found that 85% of the participants considered it a learning experience [51% Female, 49% Male] and 82% saw it as a personal challenge [51% Female, 49% Male]. This motivation was also noted by a significant percentage of participants in the Ferraz & Gama study (2019), although the percentage rate in the Brazil study was lower (47.6%). 65% of respondents in Malta reported that they enjoyed the competitive aspects of the Game Jam and felt motivated when there was competition [51% Female, 49% Male]. These findings were similar for female and male participants. However, gender disparities appear among those (76%) who claim that they participated in the event to make new friends. Of these, 30% were female, suggesting that female respondents were less likely to see game jams as a place to foster friendship. When looking at the respondents (35%) who indicated that they felt insecure or intimidated with feelings leading to pressure and anxiety during the game jam in Malta, more female (66%) respondents noted these negative feelings when compared to males (34%).

3.1 Equal Treatment of Participants?

When the game-jam participants were asked whether they believe women and men are treated equally in their work teams when working in ICT companies, Gaming companies, or in Game Jams, the survey respondents indicated that most believed there is more equality during Game Jams when compared to working in the other two sectors (ICT and Gaming companies). Only 53% of participants [48% Female, 52% Male] believed that men and women are treated equally in such work teams in ICT companies. The perception was even worse for gaming companies, with less than half of the participants [45% Female, 55% Male] believing that women and men are treated equally when they work in the gaming sectors. These results are similar to those of Ferraz and Gama (2019), as shown in Table 1 below, which compares the two results.

Table 1 – Perception of fairness within a work team in ICT companies, Gaming companies and Game Jams – comparison between Brazil (2019) and Malta (2023)



3.2 The feeling of discouragement from attending Game Jams

When the male and female respondents were asked whether they felt discouraged from attending Game Jams, 47% indicated that they were aware of individuals, particularly women, who were not keen to participate due to performance insecurities. In line with Ferraz & Gama (2019) and Harvey & Shepherd (2016), these findings suggest that women tend to doubt their technical abilities, which they assume are fundamental to game creation. This may not always be the case since game development is more multidisciplinary and draws on a wide range of people skills that extend beyond technical abilities usually linked to men. On the other hand, most of the male respondents (51%) did not perceive such discouragement for either gender. This pattern was similar to the Ferraz & Gama study; fewer men reported knowing other men who felt discouraged because of insecurity.

3.3 Perceptions about the gaming market and game jams – comparison between Brazil (2019) and Malta (2023)

When asked to give their perceptions about the prevalence of sexism in the gaming market in general, in 2019, females in Brazil had a slightly higher perception of sexism in the gaming market than males. However, in 2023 in Malta, the mean for both males and females decreased. However, in both countries, one can notice that the perceptions of females were more negative when compared to those of men (See Table 2 below).

The data also suggests that women are seen and treated differently than men in game jams. The data in 2023 from Malta shows a similar trend to that of 2019 from Brazil, suggesting that the perception of being treated differently in game jams has largely remained unchanged. The same can be said for gender bias. Interestingly, women had a higher perception of being victims of gender discrimination, and the 2023 data shows a similar trend.

Finally, the data on how people feel about their performance in game jams shows that in 2019, males had a higher positive perception of their performance than females. However, in 2023, the perception of males and females almost reached the same level. While this is positive in itself, it has to be analysed within a broader context where women are still being treated differently and risk being victims of gender bias.

Table 2 – Perceptions about the gaming market and game jams – comparison between Brazil (2019) and Malta (2023)

	2019				2023			
	Male		Female		Male		Female	
	M	SD	M	SD	M	SD	M	SD
The gaming market is essentially sexist	3.59	0.99	4.2	0.4	2.5	1.2	3.7	0.9
Women are seen and/or treated differently than men in game jams	2.37	0.96	3.1	1.22	2.1	1.2	3.1	1.3
Women are often victims of some kind of gender bias in game jams	2.28	1	3.1	1.04	2.1	1.1	3.1	1.4
How do you feel about your performance in game jams?	3.65	0.95	3.1	1.3	3.8	0.9	3.7	1.1

Table 2 above shows the mean (M) and standard deviation (SD) of the two different aspects asked in Brazil (2019) and Malta (2023). Interestingly, the standard deviation in all cases is less than ± 2 , indicating consensus on the views reported here when comparing the two surveys.

Shifting to the qualitative part of the research, respondents who scored between 3 and 5 in the table above and agreed that women are often victims of some kind of gender bias in game jams were asked to give examples of the different treatment and/or prejudice that women may suffer through their open-ended responses. One of the female respondents spoke about the prejudice against women and claimed that there is:

“It is assumed that because men tend to be gamers in their free time more than women, they hold a greater understanding [of] the task at hand and will automatically do a better job. Which is false.”

On a similar note, a female respondent claimed that when it comes to women's abilities:

“Some men belittle and/or underestimate women's abilities just because they are female. Some men may also think they know better and devalue the women's opinions.”

This was also noted by a male informant who said that:

“As there is a particular bias Within the game jams and from the perspective of the more 'hardcore gamers,' women are perceived as being less [capable] of designing them.”

It was not only women's technical abilities which were doubted, but other informants mentioned that they felt they were being treated as though they were *"inferior, less intelligent and less talented"*.

This was also noted by a male respondent who gave an example and pointed out that female game jammers are also victimised at times:

“For instance, one of the programmers is working on a section of the game, though he does not manage to solve the section logic, so he turns to another programmer, which in this instance is a female; the female programmer attempts to solve the logic but just like the other programmer struggles to. However, instead of approaching the situation gently by asking for help from other fellow teammates, she gets all the blame.”

Several female respondents felt that their opinions and ideas tended to be invalidated or were simply overlooked or ignored and that they were given minor roles in game jams. A female respondent argued that if they complain about such attitudes, they risk being trivialised for being overly emotional or irrational:

“I don't think women's opinions are heard as much as men and they tend to get ignored. There are also moments when they can be told that they are exaggerating and whining about certain things when discussing issues and problems during game jams.”

These responses underscore the pervasive gender biases faced by women in game jams and reveal the unequal power dynamics between female and male participants, particularly within a context shaped by dominant masculine norms where men dominate in numbers. Some of the male respondents adopted an essentialist view of the situation, insisting that women and men are inherently different:

“Men and women are different, and treating a woman like a man does not work ... Truthfully, each individual has different needs, but [if you] had.. to cluster data, you'd see clear differences between men and women and treating them the same does not work.

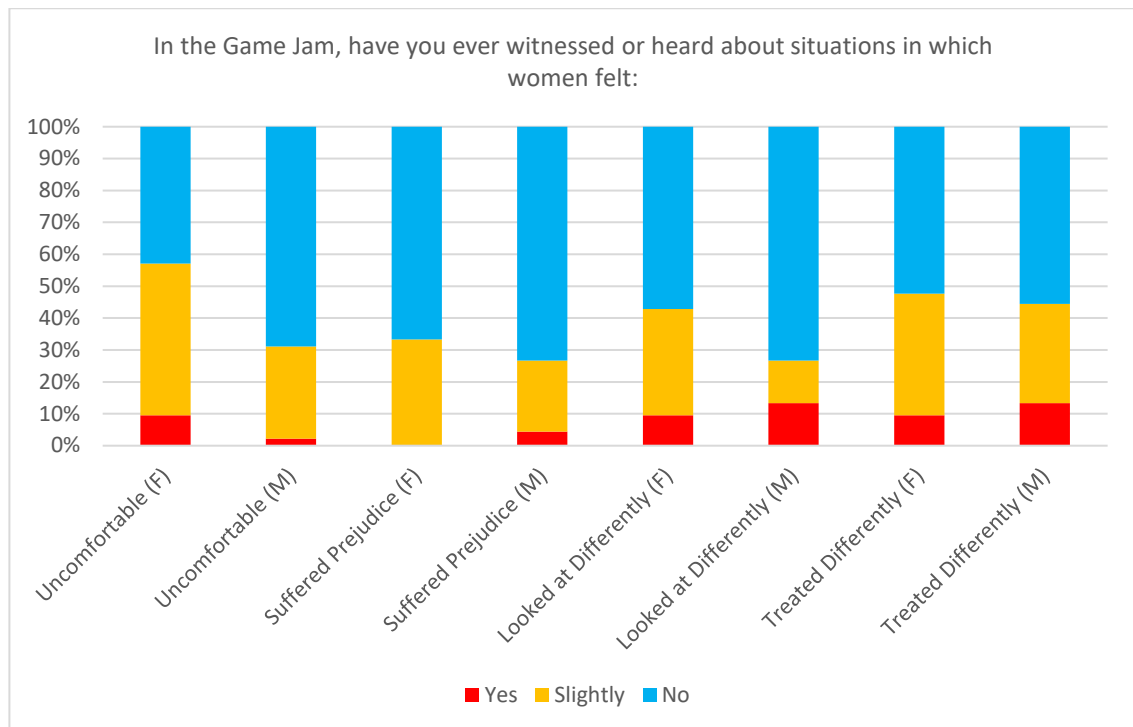
This claim reinforces the idea that gender roles are fixed and raises questions on the possibility of solving inequalities between women and men in game jams.

3.4 Different experiences during game jams between female and male participants

When assessing the experience during game jams between the respondents in Malta, a significant disparity can be noted between male and female participants (See Table 3 below). Over half of the women had witnessed or heard of situations where women felt uncomfortable (55%) during the game jam. Of these, 10% of the female

respondents felt very uncomfortable, while 45% felt slightly uneasy. On the other hand, 31% of the males noticed that women may be uncomfortable, and of these, around 1% thought that female participants were very uncomfortable during such an event. This suggests that most male participants were not sensitive or conscious of what women may endure during the game jam. This is unsurprising, considering that men operate in a context that builds on masculine norms, making them more likely to feel at ease (Kennedy, 2018). Unless you experience hostility as women sometimes do during game jams (Kennedy, 2018; Paganini, Ferraz, Gama & Alves, 2021), the participants and organisers can easily overlook this issue.

Table 3: A glimpse into women's varied perceptions and experiences shown both from the female and male perspective.



Regarding prejudice, 32% of the female and 27% of the male respondents indicated that they had witnessed or heard of situations where women had encountered slight prejudice. An additional 5% of male respondents indicated that the prejudice was significant, but none of the females thought so. One can speculate that since women are more likely to encounter sexist prejudice regularly in their daily lives, with time, they may internalise it or downplay it rather than see it as a gender issue that needs resolving (Gill, 2002). However, when asked if women are viewed differently in game jams, a higher percentage of females (33%) than males (13%) indicated that this happens, even if only slightly. This suggests that in all cases, as seen in Table 3, the female responses were higher when compared to males, to having witnessed or heard about situations in which women felt more uncomfortable, suffered prejudice, were looked at, or were treated differently during game jams.

Table 4 – A comparative analysis of gender issues raised by participants

This table lists the perceived gender issues raised by female and male respondents rating the importance and sentiment associated with each issue. Each issue is rated on a scale from 0 to 10, where a rating of 10 indicates that the problem is considered very important, and a rating of 0 means it is not important at all. The colours indicate the sentiment associated with each issue: Red signifies a negative sentiment, Yellow represents a neutral sentiment, and Green indicates a positive sentiment (although no positive sentiment was noted in this case).

Female Main Points	Importance	Sentiment	Male Main Points	Importance	Sentiment
Work is not as important as men's	9	Red	Female team members are treated poorly with a lack of respect	8	Red
Ideas not taken seriously	9	Red	Female programmers blamed for lack of progress	7	Red
Opinions of women considered lesser	9	Red	Women seen as inferior in the industry	7	Red
Women belittled and underestimated	9	Red	Women are given simpler tasks than men	6	Red
Invalidation of women's ideas	9	Red	Women are overlooked and seen as worse performers than men	6	Red
Not listening to women's ideas	9	Red	Men and women should not be treated the same in the industry	6	Yellow
Prejudice that women are less competent	9	Red	Men tend to take up more work and leave women with less	5	Red
Overlooked ideas and more minor roles	9	Red			
Women's opinions are not considered	9	Red			
Discrimination based on language and abilities	8	Red			
Lack of understanding because of gender	8	Red			
The assumption that men do a better job	7	Red			

Female responses uniformly assign high importance (score of 9) and negative sentiment (red) to concerns like undervaluation, dismissal of ideas, and assumptions of lesser competence. This reflects strong dissatisfaction with perceived biases. Male responses, however, show varied importance (scores 5–8) with predominantly negative sentiment, though less intense. Notably, one male response about differing

treatment of genders is marked with slightly positive sentiment (orange), suggesting some acceptance of this notion.

The main commonalities between the female and male lists are the themes of discrimination and gender-based prejudice. For example, 11% of female respondents noted that women are often belittled, underestimated, and have their ideas and opinions invalidated or not taken seriously, while no male respondents reported these issues. Additionally, both lists mention that women are given simpler tasks and overlooked for more significant roles in the game development industry. These qualitative responses indicate traces of gender biases against female participants, while male respondents did not report experiencing such negative biases. This pattern is consistent with Ferraz and Gama's (2019) and Kennedy's (2018) findings, where women reported feeling underestimated and unsupported, and men were less likely to perceive or acknowledge these biases. Overall, male participants were less aware of the challenges faced by their female counterparts. This sentiment was also echoed by a minority of female respondent who claimed that everyone was equally treated in their team and in general

3.5 How to make the Game Jam More Inclusive

Respondents were asked to propose ways to make the Game Jams more inclusive. After gathering their open-text replies, a scientifically rigorous approach was applied to categorise the most common themes. The identified themes were then systematically rated on a scale from 0 (least important) to 10 (most important) by the researchers, based on the frequency with which each topic was mentioned.

Table 5 below categorises and summarises the main points of feedback, dividing them into themes with corresponding issues. Female and male respondents gave each issue a separate rating, indicating its importance. The table is split into four themes: Discrimination and Inclusivity; Team Dynamics and Support; Facilities and Environment, and Recognition and Value. Each theme encompasses issues relevant to the respective category. The findings, supported by quotes from the qualitative part of the search, are discussed in more detail below.

Table 5 – A comparative analysis of perceived issues and importance ratings (least important 0 – most important 10) by gender to improve inclusivity at a Game Jam event.

Theme	Issue	Female	Male
Discrimination & Inclusivity	Immediate action is needed for discrimination, racism, sexism	8	
	Raise awareness about inclusivity		8
	Include more inclusive titles		8
	Encourage women to speak up and report mistreatment		5
	An inclusive atmosphere is already present	6	
	Average	7	7
Team Dynamics & Support	Participation primarily consists of males	8	
	Make teams as equal as possible in terms of gender ratios		8
	Teams should be more cohesive in terms of gender	7	
	Balance teams based on past experiences		6
	More time for team coordination		6
	Check up on individual team members regularly		6
	Average	8	7
Facilities & Environment	Proper food not provided for different diets	8	
	Devices not available for use	7	
	Sleeping conditions not optimal	6	
	The event ambience can be improved	6	
	Average	7	0
Recognition & Value	Women not receiving credit for their work	7	
	Female programmers' opinions are not valued	7	
	Balance the ratio of female and male programmers		6
	The arts sector is not receiving enough recognition	6	
	More awareness is needed for issues	5	
	Include all team members in discussions		5
	More game-related themes		5
	Checking in with teams for group well-being	6	
	Average	6	5

In the "**Discrimination and Inclusivity section**," both females and males rated issues such as the need for immediate action against discrimination and the inclusion of more inclusive titles as highly important. Interestingly, 50% of the female and 68% of the male respondents indicated they had not witnessed discrimination, For example, a female participant remarked that:

"In my opinion, both males and females were equally treated in the game jam both in my team and in general."

Likewise, a male respondent, when asked what could be done to foster inclusivity and remove the discrimination between women and men, replied:

"I am not sure; I personally believe it is a very inclusive environment. With my group, we had a blast, always had each other's support, and always made [sure] that everyone gets to rest in such a busy event."

When digging deeper into the responses, 41% of the female and 24% of male respondents acknowledged slight discrimination while 12% of the female and 8% of the males had noted outright discrimination (Yes). These accounts suggest that some teams fostered a positive, inclusive atmosphere, prioritising mutual support over any form of gender-based exclusion. This indicates that perceptions of inclusivity and bias can vary significantly depending on individual experiences and team dynamics.

Some of the females emphasised the urgency of addressing discrimination and the importance of fostering an inclusive atmosphere and urged the organisers to

"Take immediate action when made aware that discrimination, racism, and sexism are used to intimidate anyone, no matter their gender."

A male respondent went a step further and suggested that there should be consequences for any misbehaviour on the part of the participants. He argued that:

"From the university's point of view, maybe a 'punishment' of some sort to discourage this behaviour could be implemented."

Such statements reflect a desire for accountability and the need for the organisers to handle inappropriate behaviour rather than tolerate it.

While some male respondents had a clear idea of what needed to happen to tackle discrimination during the game jams, another male participant claimed:

"I am unsure what would be best as I do not experience their unique hardships."

This reflects a common dilemma where those who do not experience discrimination firsthand may struggle to propose effective solutions. Other male respondents had a more resigned attitude towards discriminatory treatment and shifted the burdens on the female participants to speak up:

"I think there is nothing more which can be done apart from encouraging women to voice their opinions well and inform the people in charge in case of mistreatment."

Likewise, another male participant suggested that:

"Unfortunately, if a scenario which happened this year were to occur again, it has to come from the females to speak up because otherwise, the people in charge and possibly other teammates or members who are participating would not know that it's happening."

This last statement suggests that the male respondent witnessed discriminatory treatment against women. However, rather than suggesting ways of avoiding this in the first place, he also placed the responsibility on the victims to speak up. This is never easy when you are in a minority, and speaking up can mean re-victimisation.

A male respondent suggested that the atmosphere during the game jams he was involved in was "fine" compared to situations he experienced at a place of work and, while adopting a protectionist approach towards female respondents, argued that:

"I have seen disgusting objectification at a workplace from older men, however. So maybe we could raise awareness about this and encourage young men to stand up to this behaviour because if I had the tools to do so, I would have stood up for female colleagues who were being gossiped about."

This remark shifts the burden from women to men to challenge inappropriate behaviour, unlike the other respondents who expected women to speak up.

However, another male respondent seemed reluctant to tackle inclusivity issues and argued that this may result in tokenism:

"Doing anything else, like forcing the women to make the decisions for the whole team, would probably end up doing more harm than good since it shows that there is a separation between the two genders rather than there not being any difference."

The qualitative responses on 'Discrimination and Inclusivity' reveal a range of viewpoints, from calls for immediate action and accountability to expressions of reluctance and uncertainty. It also shows that while some participants were satisfied with the inclusiveness within their team, others felt that more needs to be done to create a genuinely equitable environment. Notably, the dialogue points to a broader issue: the challenge of taking proactive measures against discrimination without placing undue responsibility on the victims themselves.

The theme of **"Team Dynamics and Support"** generated suggestions focused on improving gender balance within teams, enhancing team cohesion, and reflecting on past experiences to create more balanced teams. Several female participants noted the dominance of males in such events and stressed the importance of having more gender-cohesive teams. A female respondent argued that:

"Preferably try to have more than one female in a team of programmers as sometimes the woman's opinions get devalued, especially if she is alone with no one to back her up."

Similarly, another female respondent suggested:

"Maybe the teams should be more cohesive in terms of gender. If not 50-50, then something close to that"

However, as noted by a female participant, this is:

"Quite difficult since the participation already consists of mostly males, making it difficult to have more than one woman in the group."

Male participants also called for more gender-equal teams but differed in their emphasis on creating balanced teams based on past experiences. Instead, they suggested allocating more time for team coordination and regularly checking in on individual team members. For example, a male participant indicated that all participants should:

"Know your team beforehand so students would be fully aware of who they must work with. Discuss and meet up; this approach improves the relationship between colleagues and leads to better verbal agreement during decision-making."

The participants' reflections on the 'Team Dynamics and Support' theme highlight the need for gender balance and improved team cohesion, with females calling for more gender-equitable teams. At the same time, the difficulty of achieving this balance was acknowledged. Male participants also recognised the importance of balanced teams. However, they seemed to focus more on team coordination, suggesting that team members get to know each other beforehand to strengthen communication and decision-making. Overall, while both genders agree on inclusivity, women emphasise gender representation, whereas men prioritise improving team dynamics through better communication. Addressing these issues requires systemic changes and interpersonal strategies for fostering cohesion and inclusivity within teams in game jams.

The **"Facilities and Environment"** section raised concerns about food availability, device accessibility, and sleeping conditions. Female respondents expressed significant concern about having appropriate food for different diets, the lack of available devices, suboptimal sleeping conditions, and the need to improve the event ambience as summed up by this participant who suggested to the organisers to:

"Ensure that proper food is provided even for those who have different diets than others, ex, are vegan/vegetarian, etc., and make sure that the food is warm and is of sustenance. A breakfast consisting of a tiny croissant and a mini doughnut is not proper if you expect people to work for 42 hours with little to no sleep. Good warm food is of utmost importance, especially since it's during winter times. The fact that most students had to order food once or twice continues to emphasise this. I would rather pay a small fee for good food than pay nothing and still order."

On the general ambience and sleeping conditions, a female student added:

"Even the fact that the sleeping conditions are not optimal since it was cold and lights were left on for some reason makes warm food even more important for energy.....the ambience of the game jam can be improved, and maybe the event can be organised somewhere with the option of having better resting space. In this way, students will be less stressed."

On the technical aspect, a female respondent spoke about the importance of ensuring the availability of laptops and tablets and noted that:

"It was also a shame that devices were not available for use. Many students do not own their own devices, such as laptops and tablets, and this makes it difficult as they have to borrow a device from somewhere to be able to work during the game jam."

Fewer male respondents raised concerns. One spoke about the need for providing "better facilities for showering/sleeping", while the other simply asked for 'Pizza'. This suggests that the existing environment suits male participants better than female participants.

In the "**Recognition and Value**" theme, the discussion centred on the perceived undervaluation of women's work and opinions in programming and a call for greater recognition in the arts sector. A female respondent remarked that it was essential that:

"Women also get the credit they deserve for their work, which is [considered] just as important."

The issue of raising awareness about the recognition and value of all participants was raised by both female and male respondents. For example, a female respondent suggested that equality could be addressed during a lecture before the game jam. On a similar wave, a male respondent argued that:

"I think it's not a matter of what "we can make the Game Jam more inclusive" but more a matter of awareness, that at the end, we are all humans wanting to have a good time and enjoy making games and meeting new people and the most important, learning with every step we take. So, it's super important that we listen to each other and understand each other!"

Some respondents suggested that in Game Jams, everyone should gain recognition regardless of whether they came from the arts rather than the IT sector. On this issue, a male respondent noted that:

"Most graphics design students are women, and most IT students are men. So, the bias is that women are more artistic and men are more technical. In a game jam, both are equally important."

A female respondent also spoke about the mix of skills and how women are more likely to specialise on the graphic side:

"The percentage for the Arts would be higher than just 5%. We should get more recognition since more women are in the arts sector."

The above responses raise the need for equal recognition of skills in game creation, including the arts and the need for mutual respect and understanding that contributions from all disciplines, regardless of gender or field, are valued equally.

4 Discussion

In this discussion, we critically examine the gender disparities and challenges within the context of game jam participation and the broader video gaming culture. We aim

to synthesise the findings, contemplate their implications, and consider future directions for this field of study.

The revelation that only 32% of participants in the 2023 University of Malta Game Jam were female is a stark indicator of the gender imbalance pervasive in this sphere and the broader video gaming culture (Kennedy, 2018; Harvey & Shepherd, 2016). However, the participation rate in Malta marks an improvement from the game jam organised in Brazil (Ferraz and Gama, 2019). In that session, only 22.9% of the participants reported being female, even though a special effort had been made to invite female participants. It would be interesting to assess if the number of female participants in Malta can be increased through a targeted campaign to encourage more female participants for future game jams.

When examining the experiences between women and men in game jams, this study confirmed the masculinisation of the broader gaming culture (Kelly et al., 2023; Jenson & De Castell, 2018) with double the number of female respondents (65%) either feeling uncomfortable or very uncomfortable in comparison to (32%) to male respondents who did so. This clearly shows the need for more extensive efforts to create safer spaces for female participants since the current one seems to be hostile to them (Kennedy, 2018; Paganini, Ferraz, Gama & Alvez, 2021), even though both the respondents in Malta and Brazil (2019) considered game jams to be less hostile than the ICT and the Gaming sector for women.

When respondents were asked whether they were discouraged from attending game jams due to their performance insecurities, in line with Ferraz & Gama (2019), 37% of female respondents indicated that they were aware of other women reluctant to attend because they doubted their technical abilities. The internalisation of insecurities about technical skills on the part of women, as noted in the findings, points to systemic bias against their perceived technical capabilities and the need for a cultural shift in how their contributions are perceived and valued in game jams; this aligns with the findings of and Harvey & Shepherd (2016), which suggest that women often doubt their technical abilities, which they believe are essential for game creation. However, as argued earlier, this perception may be misleading, as game development is inherently multidisciplinary and relies on a broad spectrum of skills beyond the technical, often associated with men. Conversely, most male respondents did not perceive any discouragement for either gender, a trend consistent with the Ferraz & Gama (2019) study, where fewer men reported knowing men who were discouraged due to insecurity. A more supportive environment in Game Jams could help mitigate these insecurities among women by emphasising the multidisciplinary nature of game creation and the value of varied contributions beyond technical prowess (Kelly et al., 2023).

Interestingly, this study revealed that for 62% of participants, this was their first Game Jam. This suggests that Game Jams can attract newcomers. This presents an opportunity for the organisers to emphasise the collaborative and broader nature of Game Jams and better support the participants to reduce their insecurity and anxiety. Most participants (85%) saw the Game Jam as a learning experience, and 82% viewed it as a personal challenge, with nearly equal gender representation. This finding emphasises the educational potential of Game Jams, suggesting that these events successfully appeal to individuals seeking both personal and professional growth.

Whilst noting that in the Gama & Ferraz study (2019), 47.6% of participants shared a similar motivation, which underscores the strength of this motivation in the Maltese context, organisers can build on this by incorporating more structured learning opportunities and challenges tailored to diverse skill levels. Regarding the competitive aspects, 65% of respondents enjoyed the competition, with similar enthusiasm from both genders. This indicates that competition can be a unifying and motivating factor in Game Jams. Therefore, balancing competitive elements with collaborative goals could enhance participant engagement. However, a gender disparity was noted in social motivations. While 76% of participants attended the event to make new friends, only 30% were female. This suggests that female participants may not view Game Jams as conducive to fostering friendships as much as their male counterparts. This finding highlights a potential area for improvement in the social inclusivity of Game Jams. Organisers could consider creating more intentional opportunities for social interaction between male and female participants, thereby fostering a more inclusive and supportive community environment during such events.

Comparative analysis of gender issues in the workplace brings up shared and divergent experiences of gender-based discrimination and prejudice at work in the game development industry, as reported by male and female respondents. A central commonality is the presence of gender bias, with both male and female respondents acknowledging that women are often assigned simpler tasks and overlooked for more significant roles. However, the nature of the responses reveals a significant gender disparity in perception. For example, 11% of female respondents specifically reported being belittled, underestimated, or having their ideas invalidated, whereas no male respondents acknowledged these issues.

The differences between the lists further highlight how men and women experience and perceive discrimination differently. Some male respondents expressed the belief that men and women should not necessarily be treated equally in the industry, which contrasts with the female perspective of systemic bias. This divergence in perception is consistent with the findings of Ferraz and Gama (2019), where women reported feeling underestimated and unsupported, while men were less likely to recognise or admit these biases. In both studies, male participants showed less awareness of the challenges faced by their female counterparts. For example, one male respondent expressed surprise at the notion that the Game Jam event was not inclusive, stating he believed it was. Another felt that all appropriate steps had been taken to ensure inclusivity. Interestingly, this positive perception was not limited to male respondents, as one female participant also reported feeling that both genders were equally treated at the event.

Focusing on the participants' responses to making Game Jams more inclusive between women and men, it becomes clear that while some progress has been made, systematic efforts and cultural shifts are needed to ensure inclusivity. These responses suggest that while a minority perceive game jams as being inclusive, many female participants still experience discrimination, highlighting the need for continued efforts toward gender equality in a context which is 'oversaturated with men' (Kennedy 2018). Putting the responsibility on women to speak up can be emotionally draining, underscoring the need for proactive measures from event organisers to prevent these from happening in the first instance. There is a strong call, especially from women, for immediate and decisive action against discriminatory behaviour. However, opinions differ on addressing it, with some male respondents suggesting punitive measures.

Gender-diverse teams are essential for creating a more supportive environment, as female participants often feel isolated or undervalued in male-dominated teams. Event facilities also appear to better suit male participants, with female respondents citing issues with food, device availability, and sleeping conditions, indicating a need for organisers to accommodate everyone's needs. Concerns were raised about the undervaluation of women's contributions, especially in non-technical roles, emphasising the need for equal recognition across both technical and creative sectors. Finally, there is a clear need to raise awareness and foster a culture of mutual respect where inappropriate behaviour is challenged by all participants, regardless of gender or experience

CONCLUSION

Based on the findings discussed above, several recommendations can be made to address gender disparities and improve the inclusivity of game jams. First, organisers should implement targeted campaigns to increase female participation, building on the positive trends observed in Malta compared to other countries ([Paganini et al., 2021](#); [Kerr, 2020](#)). Creating safer and more inclusive ludic environments is essential, as many women feel uncomfortable in the existing game jam culture. This can be achieved by providing training for facilitators, establishing clear codes of conduct, and actively promoting gender inclusivity before the event.

Additionally, it is crucial to challenge the gender biases that persist regarding technical abilities. Organisers should emphasise the multidisciplinary nature of game development, highlighting the importance of diverse skill sets and contributions beyond traditional technical roles. Given that a significant number of participants are newcomers, providing better support and guidance is necessary to reduce insecurity and anxiety. Mentoring programs, structured learning opportunities, and clear communication about the collaborative nature of game jams could be beneficial in this regard.

Furthermore, enhancing game jams' educational and competitive elements can increase participant engagement. Since many participants view these events as learning experiences and personal challenges, incorporating more structured educational opportunities tailored to varying skill levels while balancing competitive elements with collaborative goals may be advantageous. To address the gender disparity in social motivations, organisers could create more intentional opportunities for social interaction between male and female participants. By doing so, game jams can become more conducive to forming friendships across genders, fostering a more inclusive and supportive community environment.

Drawing on the participants' experience, it is also clear that organisers should take proactive measures to address discrimination rather than relying on female participants to speak up, which can be emotionally taxing. Immediate and decisive action is needed to tackle discriminatory behaviour, with clear policies in place, potentially including punitive measures. Creating gender-diverse teams should be prioritised to ensure a supportive environment where all participants feel valued, focusing on fostering gender balance. Organisers must also ensure that facilities, including food, devices, and sleeping arrangements, meet the needs of all participants, especially female attendees. There should be an effort to give equal

recognition to both technical and creative roles, addressing gender biases that undervalue women's contributions. Lastly, awareness campaigns should be implemented to cultivate a culture of mutual respect, encouraging all participants to challenge inappropriate behaviour, regardless of gender or personal experience.

This research contributes to our understanding of gender dynamics in the gaming industry. It highlights the multi-faceted nature of the challenges faced. It presents a call to action for researchers, industry professionals, and policymakers to work collaboratively towards a more inclusive and equitable gaming culture.

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