Counterspaces for Women in Costa Rica: Case of study of CIDeV Game Jams

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Abstract– Women are an underrepresented group in STEM and computer science careers. In this paper we share the experience of organizing a woman only event in the format of a game jam that includes not only participants from computer science but also from art disciplines making this an inter and trans disciplinary marathon for participants. Some findings and future work are pointed out as we navigate to understand the results after two event editions. Besides technical skills, this Game Jam also promotes soft skills and idea validation between peers giving them the opportunity and space to express themselves freely through a game. Participants tend to overcome important learning curves in a three-day marathon that makes the product delivering satisfaction even greater while they explore their artistic self and meet new people in the scene.

Keywords-- women, marathon, counterspace, gender, computers.

I. INTRODUCTION

Costa Rica has a significant under-representation of women in STEM areas (Science, Technology, Engineering and Mathematics). Female participation in this type of careers is much lower than men since these are careers rarely selected by women. There has been growth in female participation in economic sciences, but not in engineering and computing where participation continues to be quite low [1].

Therefore, the question remains: how to attract and improve the persistence of women in STEM careers?, particularly in computer science and computer engineering where the proportion of women is very low. This is an important issue because the lack of women in STEM delays innovation in the field and women presence diversifies the industry allowing different visions to resolve problems [2]. This is also of special interest in Costa Rica because women have higher unemployment rates in part because they are concentrated in less dynamic areas of the economy [3] and opportunities are moving towards science, technology, mathematics, and engineering sectors [4].

In engineering, the most used pedagogical model is the project-based model which focuses on the development of a product [5]. Sometimes, the product is too rigid to follow, or students can't exploit its creativity due to the boundaries, limits or guidelines the teacher gives for a project. By adding "Arts" into the equation, students are allowed to explore their creativity and imagination which is very common in arts disciplines.

The inclusion of Arts is very important for scientists and engineers nowadays, precisely to allow them to go beyond their discipline by applying creativity to their projects and thinking processes [6]. Students should be given the space to explore different disciplines, embrace failure, keep in mind their differences, promote creativity, and beyond [5].

STEAM courses have been demonstrated to attract more women into the field in comparison with STEM-only programs [2]. Therefore, school strategies including STEAM have proven to be a good complement to science disciplines, promoting creativity and innovation [7].

For many STEM programs, the persistence of women is a matter of concern, as many report gender-based discrimination which makes it more difficult to finish their studies [8].

Many of these programs include events, special-interest groups, social activities and other spaces designed to be safe for minorities and under-represented groups [10]. These safe spaces are defined as *Counterspaces* and work as a strategy to increase and promote the persistence of women in STEM courses [10].

Counterspaces offer opportunities that allow students to incursion in the field or retain them while they share experiences, validate their opinions, and learn. The main advantage of counterspaces is the peer-to-peer relationships where they socialize and work together towards the same objective [10].

This kind of spaces increases and promotes the persistence of women in STEM because they find a way to meet people with the same interests, get mentorship and create links with people in the same field. Sometimes, they get access to opportunities that otherwise wouldn't be possible.

Game Jams are a social constructivist event. Students learn better in teams. They have mentors and peers nearby to resolve any questions they could have during the process [11]. This event also has a constructionist approach where students learn by doing and making [12]. In a Game Jam, participants form teams to make a game prototype, usually within a time frame restriction of 48 hours as well and a common theme to kickstart the design process [14][15]. Participants create a videogame from scratch, a task that many times is seen as difficult but rewarding.

Game Jams are inter and trans-disciplinary events, with a more playful and less stressful environment than similar events (e.g. Hackathons). Smith and Gayles [8] and Paganini and Gama [9] highlight that sometimes even with the adequate promotion and effort to attract women to hackathons or similar events in engineering, they do not participate. Some of the reasons women tend to participate less in mixed-gender events are:

- Low self-esteem
- Insecurity about their performance in a team
- They do not feel comfortable being a minority due to the low sense of belonging.
- Toxic masculinity that makes an unfriendly environment for them.

Even though half of video game players are women [16], in Game Jams most of the participants are men. It is common for women not to see video games as a space for a creative career, which perpetuates the problem of themes and representations.

Participation is low for all areas (programming, art, design, production, sound, testing, and administration). There's a link between the under-representation of women in the videogame and the low participation of women in computing [17].

Even though women like STEAM activities and videogames they don't seem to find their space free of stereotypes and barriers. It's difficult for them to participate in these informal experiences of learning which work not only to increase interest but also to help them visualize their work in the future [18].

In this paper we share the experience of organizing a game jam for women and non-binary people in Costa Rica, an effort aimed at promoting a more inclusive environment in the Interuniversity Community for Game Developers (CIDeV).

II. METHODOLOGY

Two game jams were organized for cis and trans women and non-binary participants, populations that usually are not well represented in game jams. The first jam was organized in 2022 and the second one in 2023. These two events were organized by Universidad Estatal a Distancia (UNED), Instituto Tecnológico de Costa Rica (TEC) and, CIDeV. Both events were promoted to college students only by sharing the invitation on social media and CIDeV's WhatsApp and Discord groups. The jam was organized in a hybrid format where on the first day participants worked the brainstorming and idea session in person and the following two days they worked virtually. This allowed the participants to sleep at home instead at the university. It is important to note that this event in particular is subscribed to a global organization initiative called: "Women Game Jam" [19] in which Costa Rica has taken part since 2022.

Teams work with a theme given by the global organization. The themes released for both editions were: "Break the rules" (2022) and "Switching Perspectives" (2023) respectively. Each team uses their creativity to work a game that matches that theme.

Several efforts were made to promote the formation of teams in advance, most of them virtually through CIDeV's Discord server. This is a practice CIDeV has applied in other Game Jams to increase the yield of the event (percent of products delivered vs teams formed). For these two events,

given most of the participants didn't know each other previously, a socialization activity was programmed approximately two weeks prior the event. Although the assistance was low on both occasions (the socialization activity was not mandatory), some teams formed thanks to that effort. Additionally, the final projects are shared in a separate session, usually one or two weeks after the event.

This event has a careful planning. The stages are different from other game jams organized by CIDeV or game jams in Costa Rica to try and encourage women and non-binary participants to feel comfortable.

Planning stages are shown in figure 1.

Fig. 1 WGJ planning stages in Costa Rica

As Fig. 1 show, the planning consists of 5 stages:
• Invitation: Active members of CIDeV's channels are invited first, often with additional efforts to expand to other women groups in nearby communities in visual arts and computer science. The inscriptions are monitored to try to ensure equal participation from both disciplines. Often there is a lack of programmers, thus the organization invites previous participants or known students directly to increase computer science participants.
• Socialization: It has been noticed that, unlike men who attend jams, women don't know each other in advance or they only know people from the same discipline. Because jams are interdisciplinary events, they must pair with people from other disciplines to form teams and create the product. To facilitate this socialization process, a meeting is organized in advance (usually two weeks before the event), so they can talk about their interests and other things in a relaxed environment. Socialization is usually framed in a context different from a school classroom. Both editions have taken place at national museums with special exhibitions in display and they have the opportunity to extend this socialization period on their own with a meal or other activities.

• Brainstorming Session: The Game Jam starts on Friday. On Friday evening the brainstorming session takes place. Teams define what they are going to do and how they are going to do it. They draw their first sketches and plan the main mechanics that day. The organization provides food and kits so they can focus on their projects. They go home the same day at night. Before the brainstorming session starts, a talk is given to the participants "by women and for women". The key speaker and mentors are mostly recognized women. Although, men are also included as mentors to expand and improve the attention to the groups. After the keynote, the theme is revealed with a welcoming video from the global organization.

• Jam Sessions: Jam sessions take place on Saturday and Sunday. Jammers work virtually through CIDeV's Discord server, where each team has its own channel. The channel is visited constantly by mentors and organizers. The jam ends on Sunday at 6 pm and participants are allowed to work on the projects later on for the closing activity if they want to improve something.

• Closing activity: This activity usually takes place one or two weeks after the jam. It has the form of an "Open House" where jammers meet to share their experience and play their games. The first edition had a live stream and the second edition had an in-person open house where family and friends were invited to play the games and meet the participants.

As the stages above showed, in this jam, the time restriction is more flexible than with mixed gender jams. Mentorship and guidance are given carefully, so participants don't feel like they are left behind, mostly because many of them are beginners.

The event is organized with the goal of managing lower pressure levels and stress, promoting teamwork, and making efforts so that every team can deliver a product without suffocation.

A. Ambassador's role

One important difference between this jam and others jams organized in Costa Rica is the ambassador's figure. The ambassador is a female student with more experience in the video game industry and jams. Besides being one of the organizers, she is the face of the event and helps other participants to feel comfortable by serving not only as mentor but also as role model. She is a peer very close in age and academic grade but, with a lot of local and international experience in the industry which facilitates a bridge between the target audience of the jam, and the objective pursued by the community, providing a constructivist approach to the event [11].

III. Results

A. Participation numbers

For the 2022 jam edition, 42 people registered but only 15 attended (35%). From which, 6 of the participants were from computer engineering and computer science careers. They formed into 5 teams, with 1 or 2 programmers per team. All 5 teams completed their prototype.

For the second edition in 2023, 40 people registered, and 26 attended (65%). Reporting an increase of 30% attendance compared with the previous edition. In this opportunity, 8 of them took the role of a programmer, being only one programmer per team to form 8 teams in total. All teams submitted a prototype, but only 5 products were completely functional.

After the first jam in 2022, 5 participants moved to a mixed-gender event the following month (4 of them being from computer engineering careers), while from the second event in 2023, 2 participants moved to the mixed-gender event the following month.

Many of the participants are from the Central Valley area but in the 2023 event, participants from other regions participated virtually or with special transportation to ensure their presence and safety.

B. Products samples with deep value

Many of the prototypes made in both editions are fun products to play with, however, in women game jams more often products have a deeper meaning than usual.

For example: "A mi propio ritmo" (At my own pace) was developed in 2022 and it is a decision-making game. Players play with the character of Yul, a teenage girl who feels the pressure to please her friends and family and her need to belong. Through her journey and diary, she finds out who she is. Throughout the game, she has to make several decisions and embrace the consequences and results of each one of them. The creators of the game say that in this game "there is no right or wrong decision". This game was developed by 3 participants, one artist, and 2 programmers. It is important to notice that in this case the three of them have had jam experienced before and the game was made in Unity engine.

Fig. 2 Decision-making sample of "A mi propio ritmo" game: Which dress should I wear to the party? Short/Normal Length/Long

On the 2023 event, one team worked on a project where a child has to make decisions while he works out his relationship with her mother who works too much and doesn't have much time to spend with him. If the player moves through the colours and explores the scene correctly, the relationship with her mother improves and they end up making a cake together. This game was made by first-time jammers in RPG Maker.

Fig. 3 Dialog sample in game: Mom, didn't you have to work?

Even though projects with that level of meaning are exceptions, participants dare to make them due to the context and they feel that they can express themselves without judgment.

These products are also rare because sometimes, when students are too new to the subject the product is delivered but not finished. It depends a lot on their level in their respective disciplines and experience in previous jams.

However, it has come to attention that this kind of deeper meaning expressions are considerably more common in women game jams than in mixed game jams.

IV. FINDINGS

Organizers have noticed some relevant things with these two jams that need to be verified with following events to improve their experience:
• In the after-survey event, participants said that they liked the event, and felt comfortable with organizers and mentors. The overall acceptance is good.
• Participants say that they like the in-person day, but they prefer to work virtually the other two days vs to stay in through the night. This also happens in mixed jams when they live close to the facility. They prefer to sleep and take a bath at home.
• Art participants are usually the first ones to register, programmers take more effort to be recruited and it usually requires extra effort from the organizer team to find programmers willing to participate.
• Some of the people who assist to the socialization activity do not attend the event. This happens frequently even though

after the meeting organizers check on them to see how they felt.
• Some participants from computing and engineering studies preferred to work as artists and explore new things about themselves. This doesn't happen to participants who come from art disciplines, further unbalancing the teams as there are usually less programmers than artists.
• Art is usually the strongest field in women's game jams (with more participants), contrary to mixed game jams where the strongest component is programming.
• Participants that come from computer science, that enter as beginners in terms of the game engine, overcome the learning curve quickly with the help of mentors developing a game in a very short time frame.
• It is common and recurrent to hear participants talk about how they have always wanted to incursion in these events, but they find the courage to do it when they checked these women only opportunity.

V. FUTURE WORK

Some points need to be addressed in future game jams:
• Increase the visibility of event results.
• Organize more talks and mentorships before the event.
• Improve materials and resources. So new participants have more information available to develop their first game and overcome learning curves.
• Seek partnerships with both, public and private organizations to make the event more accessible and relatable.
• Inquire with interviews and surveys women motivations to participate and the limitations that they find when they go to a mixed gender event.
• Organize an in-person event and compare results and participant perception.

VI. CONCLUSIONS

Women tend to participate less in mixed-gender game jams. However, gender focused events attract significantly more women, revealing this is a topic of interest but the mixed-gender space is not attractive or appealing for them.

Art tends to be the dominant field in women game jams. Many programmers are shy about their abilities and sometimes feel outnumbered and pressured to program the concept or idea that the team wants.

STEAM events like these helps to promote STEM skills by shifting focus to creativity, fun, and expression, they also help to apply many soft skills to work interdisciplinary, creating network and improve technical skills.

Women game jams create a safe space not only for women in computer fields but also in arts to express themselves, share experiences and feel secure and validated when doing so.

It's not possible to conclude at the moment what factors play a role to make a participant who experience a women game jam to join a mixed-gender event.

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