Jamming across borders: An exploratory study

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ABSTRACT

The increase in participation in game jams has given rise to an increase in research and scholarly interest in the potential benefits of game jams. While these potential benefits can include international collaboration and diversity of ideas and personal networks, there is limited efforts in using such cross-border collaboration possibilities and studying them. In this exploratory study, the authors seek to understand the possible methods, potentials, and benefits of participants collaborating in different forms and across site or national borders. While the results are preliminary, the authors identify some potential solutions for game jam participants to form teams that span regional, national, or international borders.

CCS CONCEPTS

• **Social and professional topics** → **Computer science education**.

KEYWORDS

Game jams, Collaboration, Group work

1 INTRODUCTION

The growth and profile of the Global Game Jam (GGJ)[8] have led to an increasing number of participants from countries throughout the world [16]. In January 2020, the GGJ had 934 locations in 118 countries create 9,601 games. With this growth as a global activity, there is the potential for participants to work collaboratively on the same project in more than one location (Jam site). Such collaboration can provide an invaluable opportunity for all involved to establish personal and professional connections, and experience the complexities and benefits of working in global teams. Despite this potential, there have not been many published efforts to establish mechanisms for participants to collaborate across the site (or national) borders and to study the process.

1.1 Game Jams

Game Jams involve participants (or jammers [18]) creating games based on a set theme, time frame, or location [8, 18]. Game jams may also include competitive elements through awarding prizes or acknowledgement for the 'best game' or best team' [18]. Game jams provide an opportunity for creativity,learning, and collaboration [1, 9, 15, 18].The growth and profile of the Global Game Jam (GGJ) [8], as the biggest game jam event world-wide, has led to an increasing number of participants from countries throughout the world. In January 2020, the GGJ had 934 locations in 118 countries create 9,601 games [16]. While many game jam participants typically collaborate within a single location, the globalization of the Global Game Jam (GGJ) provides a potential venue for collaboration between two (or more) locations.

With the growth of the GGJ into a world-wide community of organizers and jammers, this global activity provides an invaluable opportunity for all involved to establish personal and professional connections, and experience the complexities and benefits of working in global teams[11]. As such, several GGJ organizers have tried to establish mechanisms for their participants to work across the site (or national) borders and collaborate with others. This paper seeks to investigate the potential for the GGJ participants to work collaboratively on the same project in more than one location. Given that during the 48-hour period, all game jam locations would be working toward the same goal (producing a game), a group of other GGJ site organizers (including the authors) attempted to create an opportunity for cross site collaboration and investigate the advantages and disadvantages of cross-border collaboration.

1.2 Global Connectivity and Collaboration

The word collaboration is based on the Latin words com and laborare (to labor together). For the purposes of this paper, the authors define collaboration as contributing to a shared goal [22]. One aspect of game jams is the extensive use of development teams [12, 14, 24]. These teams work together on a shared goal. Moreover, due to the range of skill sets needed in developing a game, game jam teams are very inter-disciplinary [1, 25].

In the academia and industry collaboration within and between departments, faculties, or business units is common [21, 23]. Many large organizations have facilities that are located in more than one physical location which could be in a different county, state, or country. As the access to global high speed networks has improved in performance, reliability, and security, so has the increase in organizations that have connected to public and private international networks [3, 29]. The increase in the availability of high-speed data networks has made it possible for organizations to provide real-time connectivity between geographically dispersed locations. The

increase in connected locations has led to more inter-organizational and intra-organizational collaborations. The potential benefits of these collaborations include access to more resources, improved productivity and problem-solving ability as the result of cultural diversity, and increased efficiency in using resources and dealing with issues within the organization [11].

The disparity of cost of living and incomes between developed and developing nations has led to organizations outsourcing software or product development [7, 28]. These outsourced projects were made possible through access to reliable high-speed networks. Through outsourcing software development projects, geographically dispersed organizations have been able to collaborate on the development and testing of multiple software projects [19].

The increase in outsourced software development projects has also led to organizations that are geographically dispersed to also benefit from regional skill sets or lower cost of living to develop within the organization [13, 17]. As the GGJ consists of multiple development teams that (1) are geographically dispersed working toward the same goal, and (2) include a variety of skills and expertise that may be stronger in some location compared to another, the authors sought to understand the potential and benefits of jamming across the site (and national) borders.

1.3 Problem Statement and Research Questions

This paper addresses the problem of collaboration across site and national borders during the GGJ. While there are many potential benefits, such collaboration has not been experienced or studied much. To further our understanding of the potential advantages and disadvantages of cross-border game jams, were sought to answer the following specific research questions about cross-border collaboration at the GGJ:

- What are the advantages and attractions of this collaboration?
- What are the drawbacks and difficulties?
- What are the recommended methods to facilitate such collaboration?

To answer these questions, the authors invited other GGJ site organizers to coordinate their efforts in establishing cross-border collaboration mechanisms from joint teams to simple online chats. We then prepared a survey to collect information on how the collaboration worked and why. Our research showed that while there are many challenges in setting up cross-border collaboration, it has potential benefits and there are certain ways that it can be implemented. The rest of this paper includes a brief literature review on the subject, a description of the research process, analysis and discussion of findings, and some concluding remarks.

2 RELATED WORK

Developing a game requires expertise in different fields including programming, art, 3d modeling, sound design, business management, and many more. As a result, in game development projects, people from different disciplines are required to collaborate and to work as a team [6]. In educational settings, these skills are often taught through project-based learning settings [2].

Several previous studies have explored the value of software development projects for learners and already in 1998, early work by Daniels et al. [5] explored the potential but also the difficulties for learners of international group projects in undergraduate computer science curriculum. While the authors identified considerable potential to support learners, they also faced several challenges implementing this approach such as collaboration techniques and course management [4, 20].

This is only one example of a research paper describing efforts to summarize ideas, processes, and challenges to organize international student collaboration in the field of computer science. An important systematic mapping of relevant research papers was conducted by Clear at al. in 2000 [4]. They provide an overview of challenges and recommendations to design and conduct international software engineering courses by reviewing 82 papers related to this topic. The defined a set of 7 major themes (Global Distance, Teamwork, Curriculum/Pedagogy, Stakeholder/Role, Infrastructure, People/Soft issues, Development Process) and associated classifications to discuss processes and issues with international courses. The authors provide a list of recommendations for each challenge derived from reviewing previous work. One major challenge coming with the global distance for instance is described by many authors that the limited time overlap between sites inhibits communications and causes delays. The recommendation here is to schedule regular meetings in advance, and engage teams to communicate more often than they normally would. To give another example, the authors also identified the lack of student motivation as a key challenge. Here, the authors draw the conclusion from the review that contests and games or required participation can help to boost or maintain student engagement.

While there have been several studies showing the benefits and challenges of international projects for computer science projects, working on international game projects adds additional complexity: the interdisciplinary character of the teams. In the game development industry, many teams not only work in an interdisciplinary but also in a remote setting. Game jams and also educational settings supporting remote collaboration and also working with an international team can support learners to train this skill-set and also to extend their international network [10, 27]. The value of international game projects has been shown in a previous study conducted in a collaboration between an Austrian and a British university [25]. A total of 22 students from the two universities worked and learned together on game development projects with remote collaboration tools. The major advantages of this program included an engaging character, the learning and training of remote communication and collaboration tools and also especially to learn how to work with people from a different culture as a team. Most students also mentioned that they believe that they learned skills important for their future careers. The challenges included time issues as the remote collaboration added additional challenges to time and project management.

Thus, formats supporting the training of remote collaboration and communication skills as well as the establishment and fostering of a social network can be a valuable tool for learners and (future) game developers. The Global Game Jam offers an outstanding framework for international connections. As a tool to analyze the social connectivity between various game jam sites, social network analysis can be used. However, although the global game jam

would provide an excellent framework to shape skills in international and interdisciplinary collaboration, previous work in this field has shown that only a few jam sites are collaborating at an international level [26].

As a result, we want to find out more about potential issues and specific chances about remote collaboration during the global game jam event to engage and support jammers and jam organizers to make use of this possibility.

3 RESEARCH APPROACH

The idea of participants communicating and working together from different sites had existed at the GGJ for several years. Simple video streams have been common tools at many Jam sites, occasionally including different forms of communication among participants. Site organizers have also been in constant communication, sharing ideas and supporting each other. The possibility of establishing some formal collaboration mechanisms during the GGJ-2020 was discussed as early as GGJ-2019 and during the 2019 Game Developers Conference (GDC). In Fall 2019, a group was formed on Slack by the authors and all site organizers were invited to join and discuss different methods that participants could collaborate. By January 2020, sixteen GGJ site organizers joined and exchanged their information and ideas through a shared Google Doc. Doc. These sites were from Brazil, Canada, Germany, Ireland, Italy, New Zealand, Poland, Serbia, UK, and US (total of 16 Jam sites. Collectively, the following types of collaboration were considered:

- Working together
  - Joint groups (full cross-site groups combined)
  - Joint testing (only linked for playtesting purposes)
- Sharing
  - Shared assets
  - Shared skills
  - Shared pitches
- General Communication
  - Chats (text, video, audio) or async communication
  - Presentations and demos
  - Q/A sessions
  - Streaming

The site organizers identified any preferred location (continent, region, country, or city) they might have, and then contacted each other to set up mutual mechanisms. They identified differences in time zone and language, and also the limited time during the game jam as possible sources of problems for cross-border collaboration. Some of the solutions and mechanism that were considered included:

- Giving the Jammers the option of doing cross-border collaboration at any level they choose
- Providing a common channel (such as one on Discord)
- Emphasizing on asynchronous communication
- Encouraging playtesting and sharing assets

The following cross-border efforts resulted in actual collaboration among Jammers:

- Three sites from Europe: sharing information, pictures, and videos

- Two other sites from Europe: joint interview and simple Q&A
- One site from Europe and one from the US: inviting experienced Jammers in advance, communication through Discord, and forming a cross-border team

After the GGJ-2020, the group discussed the results and planned to organize the collaboration more efficiently for the next year.

3.1 Survey Instrument

To answer our research questions, a survey was designed to collect information from the Jammers at the 16 participating sites about their cross-border collaboration. The survey was approved by the ethics board at one of the authors' university. The invitation to participate in the survey was sent on February 22, 2020, to the site organizers who shared that with their respective Jammers. It was open to all GGJ-2020 participants regardless of doing any cross-border collaboration.

The survey questions are shown below:

(1) Did you use any international cross-site collaboration options at your GGJ-20 site?
  (a) Yes
  (b) No
(2) If your answer to Question 1 was No, why? (choose as many as applies)?
  (a) It was not offered
  (b) I was concerned about the required time and effort
  (c) I was concerned about language issues
  (d) I wanted to work with friends
  (e) I wanted to work with locals
  (f) Other (please specify)
(3) If your answer to Question 1 was Yes, what were the main attractions for you?
  (a) Improving your personal network
  (b) Improving your professional network
  (c) Learning from international partners
  (d) Getting help from international partners
  (e) Promoting your game
  (f) Other
(4) What were the available options for international cross-site collaboration at your GGJ-20 site?
  (a) None
  (b) Joint team
  (c) Shared assets
  (d) Playtesting
  (e) Exchange of ideas
  (f) Simple chat
  (g) Streaming video
  (h) Other
(5) Which options for international cross-site collaboration did you use?
  (a) None
  (b) Joint team
  (c) Shared assets
  (d) Playtesting
  (e) Exchange of ideas
  (f) Simple chat

(g) Streaming video

(h) Other

(6) What went right with international cross-site collaboration? (open-ended question)

(7) What went wrong with international cross-site collaboration? (open-ended question)

(8) What are your suggestions for international cross-site collaboration? (open-ended question)

(9) What is your age?

(10) Which gender do you identify with?

(a) Female

(b) Male

(c) Prefer not to say

(d) Other

(11) Including GGJ-20, how many times have you attended the GGJ?

(12) What was your local team size at GGJ-20?

4 RESULTS

Fourteen GGJ-2020 participants responded to the survey,6 females and 8 males. The average age was 28.9 (SD=7.2) and the average number of times attending the GGJ was 3.2 (SD=2.5). The average team size was 3.7 (SD=1.5).

As detailed in Table 1, the main reason the 35% of respondents didn't collaborate with another team in a different location was that they wanted to work with locals. This result compares with the observations of the authors that participants tend to want to work with their friends or fellow students. However, those respondents that did want to collaborate with people from other teams, 27% indicated that they wanted to get help from International partners or (23%) learn from International partners (Table 2).

Table 3 shows the frequency of the options that were available for all of the respondents. Both option (e) Exchange of ideas and (f) Simple chat had a 29% response rate. Table 4 shows the frequency of responses to question 5 and 40% of respondents indicated that they used a simple chat facility.

What went right with international cross-site collaboration? The followings are examples of participants' answers to Question 6. They particularly emphasize on the importance of exchanging ideas and new insight (as opposed to actual co-development).

- The two parts of our team were 12 hours apart so, the game could be worked on for the full time without pushing the team too hard.
- We had three partner sites in Europe and it was interesting to gain some insights into how other people were working.
- Jammers exchanged ideas, screenshots and playable prototypes.

(2) If your answer to Question 1 was No, why? (choose as many as applies)?	Responses
(e)	I wanted to work with locals	6
(b)	I was concerned about the required time and effort	3
(f)	Other (please specify)	3
(c)	I was concerned about language issues	2
(d)	I wanted to work with friends	2
(a)	It was not offered	1

Table 1: Answers to Question 2

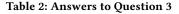| (3) If your answer to Question 1 was Yes, what were the main attractions for you?	Responses
(d)	Getting help from international partners	8
(c)	Learning from international partners	7
(b)	Improving your professional network	5
(e)	Promoting your game	5
(a)	Improving your personal network	2
(f)	Other	2

Table 2: Answers to Question 3

(4) What were the available options for international cross-site collaboration at your GGJ-20 site?	Responses
(e)	Exchange of ideas	5
(f)	Simple chat	5
(b)	Joint team	3
(c)	Shared assets	2
(d)	Playtesting	2
(g)	Streaming video	2
(a)	None	0
(h)	Other	0

Table 3: Answers to Question 4

(5) Which options for international cross-site collaboration did you use?	Responses
(f)	Simple chat	4
(b)	Joint team	2
(e)	Exchange of ideas	2
(a)	None	1
(c)	Shared assets	1
(d)	Playtesting	0
(g)	Streaming video	0
(h)	Other	0

Table 4: Answers to Question 5

What are your suggestions for international cross-site collaboration? The followings are examples of participants' answers to Question 8 (What are your suggestions?). It should be noted that the suggestions by participants can be contradictory and based on their limited knowledge of the logistics and other requirements (e.g., time zone).

- Keep site options in same (or close to same) timezones.
- There would have to be some allowances for time differences, in particular time differences of over 4 hours.
- Stronger promotion of the possibility of cross-site teams. Maybe a special tool (app) for finding teammates and collaboration during ggj. Custom made tool or from some sponsor... Everything else was great.. We had contact with two other site and it was great following their efforts.
- Making remote teams maybe (options and signing up before the game jam). Helping others remotely when you are not working on the same game is super hard - there is too much context missing in between.
- Start earlier with introducing partner sites to each other, so that jammers can get to know each other and probably form teams, before the jam starts. Once the keynote video is over, people are mainly focused on finding teammates and brainstorming ideas and don't think about the people abroad, they could be working with as well.
- It would be good to know beforehand what the participants are looking for in terms of scope and expectations. I find it's already difficult to quickly come to an agreement with

strangers locally. Maybe the two sides should be separated by "department", as in one site would do art/music, and the other would do programming so that the flow of production remains unhindered.

- It needs to be easier to cross-site collaborate. I found that I didn't know how to participate, or collaborate with international partners.
- I'm not sure if this exists already, but you could have booths or working areas designed for this with cameras and screen-sharing software already set up to facilitate this.
- Earlier notice about this being an option. At the time we learned about this, we already had 6 people on our team and it would be too much to also have international collaboration.

5 DISCUSSION

While the authors had expected a larger response rate and acknowledge the limitations of making any generalizations about the findings, there are some key discoveries that are worth considering and provide valuable resources for further research.

Clear et al. [4] conducted a systematic review of 83 papers in the field of international collaborations in computer science projects and have grouped challenges and recommendations around seven themes. However, due to their short time span and interdisciplinary character, game jams pose different challenges than other development projects. As a result, we used the summary of key challenges and recommendations provided by Clear et al. as a starting point and extended and adapted their list based on the results presented in the previous section. This results in an overview summary of four key challenges and recommendations based on the survey answers presented in Table 5.

6 CONCLUSION

Based on this exploratory study, the authors conclude that while setting up and managing cross-border game jams can be challenging, there are potential pedagogical and logistical benefits from this approach. For example, in some sites, there were relatively small groups which resulted in a lack of diversified skill sets. If a cross-border collaboration opportunity had existed, then this challenge may have been overcome. Exchanging ideas and collecting new insights also seem to be a key potential benefit, in addition to extending professional networks.

The authors will seek to further research the potential for cross-border collaboration within game jams to provide generalizable findings. Increased participant population, comparison with distributed game development companies, seeking input from organizers, and investigating the longer-term impacts are among possible directions of future research.

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Challenge	Recommendation
Global Distance Limited time overlap between sites	(1) Keep "collaboration site"-options in same or in close time zones (2) Enable synchronous collaboration option (e.g. through constant video communication) (3) Use primarily asynchronous collaboration option when in different time zones (this will also help with language issues)
Teamwork Difficulties to create (well-balanced) teams	(1) Appoint remote teams earlier (2) Keep remote teams small (3) Organize remote teams by discipline (e.g. one location responsible for audio, the other for graphical assets) (4) Enable automatic "smart" team mapping with a tool (5) Use less complicated cross-border tasks such as sharing assets and exchanging advice
People/Soft Issues Lack of trust between teams, lack of knowledge about skills and expectations of others	(1) Honest feedback of jammers about their own abilities (2) Introduce social bonding activities early (3) Start with simple social interaction to establish experience and foundation for next years
Infrastructure Communication and collaboration technology challenges	(1) Advance Planning (2) Collaboration Workstation (e.g. camera setups) already set up at location

Table 5: Overview of challenges and recommendation for jammers and jam organizers based on [4] and the answers from the survey

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