Serious 'Slow' Game Jam - A Game Jam Model for Serious Game Design

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ABSTRACT

The Serious 'Slow' Game Jam (SSGJ) is a new model for use in serious game design and research. Game jams contribute to creative, innovative and collaborative design, however, game jams for serious purposes require an alternative model that integrates domain experts within the jammer community to ensure the validity of their designs and content. Furthermore, a rigorous yet accessible design methodology is required to balance pedagogic and game aspects to support jammers, as well as to assist researchers in subsequent analysis and evaluation. A standard entertainment game jam model does not afford support for these aspects. The SSGJ model addresses these needs through an inclusive, collaborative, and creative framework for multidisciplinary teams, which includes: encouraging reflection and knowledge exchange; improving content validity; and providing continuous support and mentoring to participants. Reflection on the model highlights the importance of framing serious game jams as explicitly educational activities and embedding them into existing training contexts. The SSGJ model contributes to a collaborative serious game design methodology for the wider research community, irrespective of application domains.

CCS CONCEPTS

• **Applied computing** → **Computer games**; • **Human-centered computing** → **Collaborative content creation**.

KEYWORDS

Serious Games, Serious Game Jams, Serious Game Jam Design, Interdisciplinary Game Design, Game Design Methodology

1 INTRODUCTION

Serious games are "experiential gaming technologies for wider purposes" [40] or, "games that do not have entertainment, enjoyment or fun as their primary purpose" [27]. Game jams aim to rapidly produce a (prototype) game from scratch, usually with design and time constraints. Whilst it may first appear that game jams for serious purposes are simply a subset of game jams more generally, this paper explores some marked differences in the required processes, personnel, and outcomes, and challenges the notion that conventional game jam formats are (necessarily) the best fit for game jams for academic, educational, and/or research purposes. This paper investigates serious game jam design methods, and their associated benefits towards the serious games research domain. We present a freely available model for a Serious 'Slow' Game Jam (SSGJ) (building on current best practice) and its associated toolkit of resources, analyse its use within a specific subject domain, and reflect on its advantages and limitations as a complementary jam format.

1.1 Why are Serious Game Jams Different?

The creative, innovative and community-building potential of game jams, has been widely acknowledged [7, 11, 14, 15, 28]. Due to their purposefully short duration (average range of 24-48 hours [21]), game jams provide a design framework best suited to a rapid prototyping approach [28]. Key traits of rapid prototyping are promoting creativity through constraint, embracing failure as a source for learning, and encouraging experimentation and risk-taking due to lowered time and investment costs. This practice aims to promote innovation through the creation and evaluation of prototypes to filter out which ideas have merit for further development [11, 28, 30]. Game jams complement established game creation practices, which typically involve lengthy development times, multiple iteration cycles and considerable investment of time and money. From an educational perspective, game jams offer creative thinking, teamwork, and time/project management challenges to the participants, as well as an overview of the game production process in a condensed format, thus supplementing formal educational practices [14, 17]. In addition, they constitute important cultural and social events for

game developer communities.

Reflecting these benefits, game jams have emerged as a booming cultural phenomenon [42] and have received widespread attention from a multitude of research fields and perspectives. Researchers have investigated the qualities of games produced during game jams and the development practices that participants employ [10, 29], the educational value of game jam participation in terms of soft and hard skill development [14, 26, 33], the impact of game jams as a cultural practice on the game developer community [23, 33], and the use of game jams as production and training tools in formal educational frameworks [9].

Although most game jams are aimed at creating entertainment game prototypes (Global Game Jam (GGJ) and Ludum Dare being notable examples), it is not surprising that serious game jams have been recommended and implemented as a tool for serious game design and research [6, 35]. Academic game jams are one of the three categories recognized by Goddard, Byrne and Mueller [17], alongside independent and industry organized game jams. From a research perspective, game jams can be analyzed as a combination of crowd-sourcing [18] and research by design practices [6] with additional unique features, such as providing a social and playful work environment [17, 23, 33]. However, as noted by researchers with experience of serious game jams, the conventional entertainment-oriented game jam format (modelled after GGJ) has characteristics which may make it not best suited for serious game design [3].

A key trait in serious game design is multidisciplinarity, since it involves the synthesis of domain-specific, pedagogical, and game design knowledge. This is reflected by the Triadic Game Design (TGD) methodology, which names these 'worlds' as Reality, Meaning, and Play respectively. [19]. TGD provides a very fruitful framework on which to develop game jams specifically for serious purposes. The mapping of these three distinct competencies refocuses a serious game jam from product to process - the emphasis is on the serious outcome after playing the game (and therefore the mapping process), rather than producing the most polished prototype. Furthermore, due to the essential nature of TGD's interrelations, serious game design benefits from implementing a collaborative design framework which includes domain experts, educators, and game developers in order to facilitate knowledge exchange and improve rigour. It follows that the personnel involved in serious game jams are therefore likely to be quite different than those taking part in entertainment game jams. This presents a distinct need not met by conventional game jam formats and is a challenge to be incorporated in serious game jams, as noted by jams including: the Complexity Game Jam 2020 [20], noPILLS [35] and BrainJam [9]. Another characteristic that would be limited by conventional game jams are the time/skill barriers to inclusion for stakeholders from a wide range of professions [3].

1.2 Paper Structure and Position
This paper analyzes game jam design parameters before drawing insight from literature and practice towards the design of a

model better suited to the specific needs of the diverse serious game community including participants, domain experts, educators, and serious game researchers. We draw on, synthesise, and adapt, relevant game jam and design sprint principles, focusing on the key components of collaboration, creation without preparation, and improvisation – and challenging the need for intense time pressure, in line with an increasing acknowledgement for the need for 'slow' game jams as a complement to conventional models [24, 38]. We then propose the research-informed Serious 'Slow' Game Jam model (which distributes the short contact time of a typical jam over a much longer duration), building on good practices in the field focusing on inclusivity, flexibility, and knowledge exchange. In particular we propose: that the integration of domain experts is a crucial component to produce meaningful results; and that brief time-span game jam formats are not conducive to multidisciplinary collaboration, whereas introducing break time for reflection and paced, cascaded knowledge exchange is more fruitful and inclusive. Finally, we reflect on the opportunities and limitations offered by the SSGJ model, and discuss its wider contribution to serious games design and research.

2 RESEARCH CONTEXT
2.1 Overview of Game Jam Design Parameters
Game jams can have diverse formats according to their aims and context, while sharing a baseline of similarities [7, 13]. The following parameters have been synthesized from the literature, and provide insight into game jam design.

(1) **Theme.** A theme (e.g. word, phrase, concept), announced in advance or at the start of the jam, provides a creative constraint which is open to interpretation by participants. In addition, optional prompts to guide creativity may also be provided (game genres, player modes, specific mechanics, etc.).

(2) **Time.** Time constraints usually range from 8-72 hours, with 48 hours being the most prevalent choice, typically during a weekend. Although intense time pressure can be considered as conducive to jammers' creative focus [18], it has been highlighted as a considerable challenge for participants [10] and can also be interpreted as a glorification of 'crunch culture'. Furthermore, intense time pressure imposes accessibility barriers to a range of people who cannot (or choose not to) participate due to caring responsibilities, neurodiversity, and disability, amongst other reasons. It is increasingly being acknowledged that the removal of stress factors from game jams is an important step to improving participant diversity [16].

(3) **Location.** Some game jams take place as gatherings in physical locations and others are hosted solely online. Since digital literacy is widespread in the game developer community, online game jams are popular due to their increased reach and flexibility, and the remote teamworking mode is aligned with established work practices [8]. Nonetheless, researchers comment favorably on the community-building and experiential potential of physically co-located game jams and advise them

where possible [17, 18].

(4) **Participation & Teams.** Participation requirements vary depending on context. Independent game jams are usually open to anyone. Academic game jams may have participation requirements (relating to skill or expertise) or be invitation only [17]. Practices vary with respect to team formation. The GGJ model asks explicitly for single participant registration, since team formation is part of the event. In other cases, preformed teams are encouraged and in others, there are procedures for team matching during the event, which may involve curation by the organizers. Based on evaluation of user experience and outcomes, team formation curation is strongly encouraged [12]. There are various models for team formations, such as the one presented by Buttfield-Addison, Manning and Nugent [5], which is inspired by the Mechanics-Dynamics-Aesthetics (MDA) model, and the Massachusetts Institute of Technology (MIT) Innovation model [28].

(5) **Technology.** Although most game jams are tech-agnostic, some jams are dedicated to the use of specific platforms for game production (e.g. Gamemaker, Godot), user interfaces and mechanics (e.g. Point and Click Game Jam, Text Jam), or algorithms (e.g. PROCJAM, AI Jam) [13].

(6) **Support.** Participant support is a design parameter that allows a depth of approaches. Usually, support in entertainment game jams is minimal, as in the example of GGJ, which includes a keynote talk to orient players with the theme. In some cases, workshops and presentations are organized in advance to teach and train relevant skills, including fast prototyping methods, game design methods, or particular mechanics implementation [7]. Assigning mentors to support participants throughout is another practice, and jammers can also be encouraged to mentor each other, if appropriate [7, 37].

(7) **Deliverables.** Typical deliverables are game prototypes and supporting media, such as a gameplay video and short text description. Furthermore, a prompt for active reflection can be included by inviting participants to do a 'post mortem'-style presentation after the game jam, alongside their game demonstration [7]. Game jams are usually framed as non-competitive (GGJ), yet competitive elements may be present e.g. voting for top games in predetermined categories by participants or a panel of judges. Some game jams have prizes for winning teams.

2.2 Previous Recommendations for Serious Games Jam Design

Past serious game jams provide valuable insight into the challenges, practicalities, and good practices associated with organization and design that is more suitable for non-entertainment games. This informs our SSGJ design and provides a rationale for adapting or challenging the game jam design parameters presented above.

Theme plays a significant influencing role in a serious game jam as it is more than just inspiration for game design, it is an integral (and demanding) aspect of the activity, requiring appropriate and accurate content creation. Furthermore, to effectively design serious outcomes from the games, pedagogy emerges as an additional crucial parameter, as participants needs to be able to understand how to: design, implement and convey learning through game mechanics. This additional need for pedagogy therefore necessitates the inclusion of materials such as the LM-GM cards [4] that can support participants in understanding the learning aspects of a serious game.

Therefore relevant skills needed by participants go well beyond technical knowledge and competencies related to game design and development. To address these major additional needs, the main recommendations from existing literature on serious game jam design refer to the Time and Support parameters, with jams being broken up into phases with breaks in between and explicitly including educational content. In [3] an initial study phase was followed by a week-long break, then the game development phase with temporal scaffolding in the form of task milestones. The organisers highlighted the need for longer time frames compared to entertainment game jams in order to appropriately address the challenges involved. Another jam [32] also included educational content a week in advance and split synchronous and asynchronous activities over a longer time frame: a 48 hour jam led to initial selection, then 2 weeks of development led to the selection of one game for further development and public release. This progressive filtering of design ideas from prototypes to product is aligned with a rapid prototyping approach. In some ways, a serious game jam benefits from a temporal structure similar to a design sprint however, recurring rest periods of a week or longer between activities is likely to be a fruitful approach.

In terms of Theme and Support, every study considered [25] recommends domain experts as mentors or full participants, by integrating lecture-like content at key points the jams [32], providing curated thematic guidance [32], pairing professionals with game design experts [1, 32] and other stakeholders [35] to ensure alignment with the goals of the activity, and providing a clearly structured journey through the whole activity [1, 3]. The necessary additional Support for serious game jams, crucial to ensure the validity of the 'serious' content of games in development, also has implications for Participation and Teams (as can be seen in the recommendations for mentors/participants) and implies a strong need for robust knowledge exchange activities.

3 SERIOUS SLOW GAME JAM MODEL

The SSGJ model falls under the wider category of 'applied game jams', which are defined as "game jams that explore a range of different topics, issues, and objectives through game development" [36]. For this reason, to aid in the design of our model we employed Reid *et al.'s Theoretical Framework for Game Jams in Applied Contexts*. With the goal of providing a framework for new applied game jam models, the theoretical model involves investigation of four

aspects: the problem space, the jam design, the jam delivery and its outcomes, and any follow-on opportunities.

3.1 Problem Space

In terms of the problem space, the objectives were to deepen participants' understanding of a particular domain (in our case, cybersecurity) and to identify and reflect on the serious game design patterns of jammers' designs. Therefore the methodology was to support both educational and research outcomes. Outcomes include participants who are more engaged in cybersecurity practices, serious games on particular cybersecurity topics, and a conceptual map of serious game intervention strategies. Our SSGJ methodology is intended to be flexible and generic so that it can be used irrespective of application domains.

3.2 Organisers & Participants

The SSGJ model is intended to be flexible in terms of participants and jam delivery can be adjusted to suit the participant group's levels of technical, pedagogical or domain knowledge - the examples discussed in this paper range from primary school to masters level students. Regarding organisers, to appropriately support jammers it is necessary to have representation of experts from: the application domain (here being cybersecurity) and serious game design. The experts for both categories were academics who are active researchers in: cybersecurity, software development, general game design and serious game design.

3.3 Jam Design

We defined guiding criteria as: 1) creating a multidisciplinary, collaborative framework for rigorous serious game design and 2) providing guidance and mentorship throughout the jam both to frame participation as a structured, educational and accessible experience, and to support the value and validity of the outputs. The following section presents the new SSGJ model, analyzed in line with the parameters described above.

(1) **Theme.** Content is guided by domain expert mentors and structured educational materials including a bespoke card deck modelling cybersecurity concepts, information, and relationships. We provide theme inspiration with 'small provoking games' (SPGs), i.e. short serious games designed to provoke reflection on the problem at hand [2]. Our procedure includes prompting participants to play the SPG prior to the jam and hosting a group discussion facilitated by mentors at the onset, where the group attempts to contextualize the game experience within the application domain. This activity is intended to kick-start knowledge exchange through dialogue and thus draw out research questions and hypotheses for the serious game ideation stage. Whilst the Theme resources are cybersecurity-focused, the SSGJ structure is domain agnostic, and robust documentation supports the creation of new domain-specific card decks and/or SPGs.

(2) **Time.** Multidisciplinary participants need time for knowledge exchange and reflection and to understand the SSGJ model itself. However, there is a practical need to avoid deterring individuals with heavy workloads so the total active time of the jam should not increase. To reinforce accessibility and inclusivity, the SSGJ model is a 'no-crunch' working environment with non-exhausting session durations. This model re-evaluates time pressure based on serious game design needs. Drawing on practices in [3], we structured the game jam as three separate phases, each devoted to a stage in the game creation life-cycle (design, development and pre-release), with ample time in between for reflection (2 weeks) and a total duration of 4-5 weeks. Each phase is 2 work days, leading to an overall active engagement duration of 48h, matching typical game jams. The break time between phases is dedicated to tailored feedback to each team by the organizers and optional refinement work by the jammers, with flexible expectations defined by their availability (Table 1).

(3) **Location.** As our target group is diverse, we offered different participation modes and embedded flexibility of engagement intensity in the model. To strike a balance between the acknowledged benefits of online and physical participation, we propose a hybrid format, where all engagement needs are served on an online basis to prioritize inclusivity and accessibility, while also catering for optional physical presence to accommodate direct socializing and local networking needs.

(4) **Participation.** Following literature recommendations on team curation [12], teams are created by organizers using self-identified roles collected during registration, taking into account participant preferences and existing social connections. All participants remained in their assigned team throughout the jam, but they were not necessarily present for each and every activity, allowing flexibility around external commitments such as childcare or doctor appointments. Each core team also has an assigned domain expert mentor, recommended by [35], and a serious game design expert mentor. Where serious games research is an outcome we also recommend the placement of a research project member. The explicit inclusion of both domain experts and serious game designers as participant-mentors allows the delivery of high-quality support materials [3, 9, 31, 32], guidance in framing the SSGJ theme [32], supporting and contextualizing domain related material, and validating its modelling in the serious game. Assigning a domain expert as a core member of each team intensifies the contact and knowledge exchange between experts and jammers, as advocated in [3, 32].

(5) **Technology.** Serving the hybrid modality, we propose using asynchronous and synchronous modes of communication on social platforms (e.g. Discord), online collaboration whiteboards (e.g. Miro), and remote teamwork tools featuring cloud storage (e.g. Dropbox). This technology supports ongoing documentation of design and development decisions. In terms of the game platform, we do not propose any limitations - this is especially important given the wider range of relevant skills represented in participants and therefore anticipating lower technical development skills, on average.

Table 1: SSGJ Structure showing time, milestones, and support activities.

	Week 1 (Phase #1)	Week 2-3 (Optional)	Week 3 (Phase #2)	Week 4-5 (Optional)	Week 5 (Phase #3)
Phase focus	Design		Development		Development and prototyping
Time	2 working days	2 weeks	2 working days	2 weeks	2 working days
Support	Domain Lecture Domain card activity SPG workshop TGD workshop	Reflection Mentor feedback Refine ideas	LMGM activity Game loops workshop	Reflection Mentor feedback Refine ideas	Peer review MDA framework Pedagogical patterns
Deliverables	Design document (draft)	Design document (final)	Greyboxed prototype	Early game prototype	Final game prototype, rules, documentation

Participants should be supported with instructions on any specific tool use at the beginning of the game jam.

(6) **Support.** The SSGJ model includes guided, educational group activities supported with digital and physical materials. During Phase #1, jammers are introduced to key serious game concepts, terminology and the Triadic Game Design (TGD) methodology [19, 19, 41]. Support materials include three card decks: one domain-specific and two covering Learning Mechanics and Game Mechanics (LM-GM) [4] (to be used as design tools). Tangible toolkits, especially for abstract concepts, have been noted as useful for: increasing design speed and focus; articulation of reasoning and justification for decisions; and resolving disagreements [34]. In Phases #2 and #3, ready-made assets for common game functions and customizable Unity scripts that implement game mechanics introduced in the LM-GM framework are provided to speed up development. These activities, alongside the domain related activities (e.g. the cybersecurity lecture and SPG discussion), are spread across phases as shown in Table 1 and, we propose, will result in strong learning outcomes for participants as well as serious game prototypes that have high rigour and domain validity.

(7) **Deliverables.** In addition to the usual deliverables (a game prototype and documentation), we include a serious game design document (SGDD) which lays out each serious game design according to a provided template, drawing from practices in [7], as a means to encourage an analytical approach during design from the jammers and to support the researchers in their consequent analysis. All educational activities during the SSGJ feed into the SGDD template. Because of the long overall duration of the jam, participants are provided with milestones to pace and monitor their progress, following practices in [3], as shown in Table 1.

3.4 Jam Delivery and Outcomes

SSGJ delivery is analyzed below. It is important to reiterate that the model is designed to function for participants as a significant learning opportunity as well as a creative and productive exercise.

Overall outcomes of each SSGJ include the serious game prototypes, SGDDs and documented analysis of each game, and the jammers' learning experience. Outcomes of the SSGJ model as a whole include the potential re-use of the entire design and support toolkit provided during the jam, e.g. adaptable structure, the Cybersecurity, Learning Mechanics, and Game Mechanics Card Decks, structured activity worksheets and digital whiteboards, code snippets to speed up implementation of common game mechanics, small provoking games, and documentation to assist in creating toolkit resources for other subject domains. All of these elements are freely available for use.

3.5 Follow-on Opportunity

Through the embedded educational/analytical activities and the SGDD deliverable, the SSGJ model supports subsequent analysis and evaluation of the game jam outputs for research purposes. The research outcomes (for example, pedagogical patterns suited to the particular domain problem) are being analysed and will be shared in future. The published results can in turn support follow-up research both for serious game interventions on the specific domain, but also for serious game design methodology in general. Furthermore, the SSGJ provides a wealth of digital and physical resources to support serious slow game jams (e.g. the templates, card decks, and code snippets mentioned above) for adaptation by academics and researchers in other disciplines.

4 IMPLEMENTATION OF THE SSGJ MODEL

4.1 Participant Analysis

The SSGJ model was used to deliver three successful SSGJs between November 2021 and July 2022. Each event was supported by a minimum of three serious game design experts, a minimum of three cybersecurity experts, and a narrative designer, who acted as mentors throughout, plus additional support from members of the research project team. SSGJs #1 and #2 were in a hybrid format with the option to participate online or in-person, arranged as two contact days for each phase, with a two week break between each phase. Recruitment was open to anyone and advertised through social media and project networks. Due to the subject domain, the

Table 2: Summary of SSGJ events

	Format	Synchronous Contact Time	Overall Duration	Registered Participants	Actual Participants	Average Attendance	Age Range
SSGJ #1	Hybrid	48 hours	4 weeks + 2 days	12 (10m, 2f)	6 (4m, 2f)	75%	
SSGJ #2	Hybrid	48 hours	4 weeks + 2 days	14 (10m, 4f)	0	-	-
SSGJ #3	Hybrid	48 hours	5 weeks + 1 day	14 (11m, 3f)	13 (10m, 3f)	88%	22-35 (mean 26.3)
SSGJ #4	In-person	30 hours	5 days	27 (19m, 8f)	23 (16m, 7f)	97%	10-16 (mean 12.2)

target audience was anyone who codes (including professionals, students, and hobbyists), however registered participants were mostly students. Participant attrition had a significant impact, with a high (33%) rate for SSGJ #1 and SSGJ #2 had to be cancelled due to low attendance at the first event. The difficulties in open, public recruitment led us to consider the context of the SSGJ deployment and, as it was already designed as an educational creative experience, the remaining two SSGJ events were offered as complementary events within an existing framework. SSGJ #3 was integrated into a postgraduate programme (where students could optionally use the jam as a basis for coursework) and SSGJ #4 was adapted to use at a summer school with a younger participant pool and a shorter overall duration, whilst still preserving the SSGJ guiding criteria. Table 2 summarises the four jams (three successful, one cancelled) and shows much higher participation and attendance for the latter two events which we propose is due to the logistically smoother recruitment process.As part of registration we gathered data on participant demographics, motivation, and previous experience. This data is presented below, with participants who attended less than 60% of the SSGJ excluded. We analysed motivations for participation in the latter two SSGJs , with a list of possible reasons to participate graded on a 7 point Likert scale of how influential each was in deciding to attend. These questions were formed based on findings from Steinke *et al.* [39] and Lai *et al.'s* [22] observations from multiple decades of previous game jams.

The results (Fig. 1) indicate that the main reasons to participate in SSGJ #3 were to: acquire knowledge and skills in cybersecurity, to acquire knowledge in game design and game development, and to collaborate with experts, with 10/13 participants in each category rating this reason as "very influential" and mean scores of 6.5, 6.2, and 6.6 (out of the maximum of 7) respectively. The least influential reasons were to establish a business partnership (mean 3.8), and to acquire knowledge to start up a company (mean 4). For SSGJ #4 (see Fig. 2) influences on attendance were rated lower across all categories with the most influential categories being to acquire knowledge in game design and development (mean 5.8), to create a serious game (mean 5.6), and fun and enjoyment (mean 5.4.) The least influential categories were related to starting a business, as in SSGJ #3. These results support our analysis of process (both educational and experiential) being (at least) as important as product for participants in serious game jams, and the recommendation for formal inclusion of domain experts. Participants were asked to rate their experience and skills related to the domain area, game design, and gaming in general prior to the start of the jam. Table

Table 3: Participants' self-reported experience, mean score of all participants on a Likert scale of 1 – 7.

	Gaming	Game Jamming	Coding/ Programming	Secure Coding
SSGJ #3	3.4	1.9	N/A	2.1
SSGJ #4	5.3*	3.0	4.0	2.5

Table 4: Participants' self-reported skills, mean score of all participants on a Likert scale of 1 - 7

	Game Designer	Game Dev	Game Art (Visual)	Game Art (Audio)	Secure Coder
SSGJ #3	1.5	1.4	1.3	1.4	1.8
SSGJ #4	3.3	2.9	3.0	2.6	2.0

3 and Table 4 show prior experience and self-reported skills, averaged for each game jam. It is notable that only one score (gaming experience for the schoolchildren participants of SSGJ #4, shown indicated with an asterisk*) is above the mid-point of the scale, with participants in SSGJ #3 reporting low experience and skills in all categories. This supports our expectation that the participants in these jams do not necessarily already have strong game design or development skills and therefore underlines the requirement of enhanced support structures.

4.2 Initial Reflections on SSGJ Deployment

The first notable issue arising from the SSGJs is recruitment. In line with the project's core audience of 'anyone who codes', we initially aimed to recruit a mixture of students, creatives, and software development professionals to each jam. However, we acknowledge the tensions between the accessibility aims of the SSGJ (takes places within working hours, not expecting 'crunch culture') and the recruitment of working populations, which led to a smaller and less varied group of participants than anticipated, even taking into account the planned ability to 'drop into' a team at the most useful phase of development. The challenges of recruiting mixed populations should not be underestimated due to the different barriers
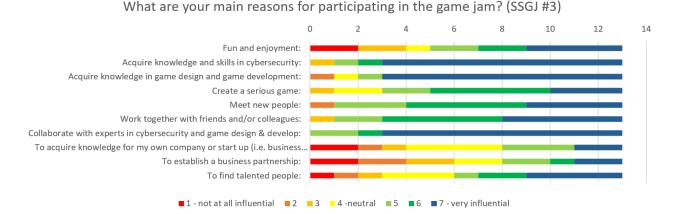
What are your main reasons for participating in the game jam? (SSGJ #3)

Figure 1: Motivation to participate for SSGJ #3

What are your main reasons for participating in the game jam? (SSGJ #4)
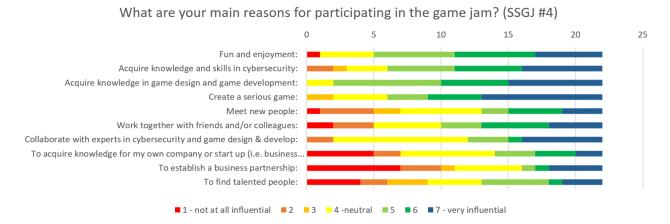

Figure 2: Motivation to participate for SSGJ #4

faced by different groups. For example, for working coders, engaging in continuing professional development (CPD) in the form of a jam on fixed dates proved very difficult, despite motivation. Student participants demonstrated less time pressure (except for one occasion where the jam dates clashed with a course deadline which affected attendance) but barriers included a lack of confidence in achieving jam outcomes for some. It should also be noted that three SSGJs took place during 2021-22 where COVID-19 restrictions were a relevant consideration and therefore the hybrid delivery was, for some events, a logistical rather than pedagogical requirement. We noted that online participation was especially useful but did sometimes negatively affect engagement. This period also saw an unusually high proliferation of online game jams which somewhat saturated the game jam community and may also have affected recruitment and participation. Due to: the higher number of participants, lower attrition rate, and better attendance in SSGJ #3 and #4 (see Table 2) we propose that more targeted recruitment has a better chance of success than open, e.g. explicitly positioning the SSGJ as an option within an existing educational context such as a

degree programme or CPD offering. This leads to the second main reflection, how to frame the events. We observed a misconception in some participants that the jam was a course on game design, as opposed to a method to learn about another topic *through* serious game design. Correctly framing the SSGJ and effectively communicating it to target participants is crucial.

The third main theme regards participant capabilities and confidence. SSGJ participants were enthusiastic learners but generally rated themselves low in technical, design, and game literacy skills (Table 4), meaning aspects of the SSGJ toolkit designed to support digital game development (e.g. Unity code snippets implementing common game mechanics) were not used as they were not understood by the majority of participants. For this reason, the majority of serious games developed during the jams were tabletop rather than digital games (some of which were explicitly framed as a prototype for a digital game which could be developed later.) The lower-than-anticipated skills levels also affected interaction with experts, a key motivation for participants attending (see Figs. 1 and

2) and necessitated a redesign of much of the domain (and, to a lesser extent the serious game design) support material to become suitable for novice participants. Fortunately, this makes the SSGJ model in its current form more broadly accessible.

The final reflection is that the 'slow' aspect of the SSGJ appeared to be successful for most participants in terms of providing space for reflection and focus, despite time spent on asynchronous activities falling short of our prediction. There was a disparity between participants, some engaged a lot in the asynchronous activities and some did not engage at all. The 'slow' aspect was used by some teams for additional development of prototypes but for most it appears to have functioned as a period of intangible cognitive reflection or deepening understanding. It is notable that, even on SSGJ #4 where the overall duration was compressed to 5 days, several participants continued engaging outside of the contact hours, and even these short reflection periods were sufficient to allow the creation of concepts and prototypes. Several participants in SSGJ #3 also took advantage of the 'slow' aspect to attend flexibly despite other (medical, childcare, and academic) commitments demonstrating increased inclusion. Slow game jams run by others show similar success in inclusivity and reflection on the creative process [24, 38].

4.3 Recommendations

We propose the following recommendations for future implementations of the SSGJ model in other serious game design and research contexts:

(1) The SSGJ should be targeted to, and integrated with, (formal or informal) educational or CPD programmes such that it dovetails with participants' other time commitments and is highly appropriate for their needs.

(2) Expectations and outcomes should be clearly communicated if the target audience is likely to have limited prior skills in game design and development. Importantly, the function of serious game design as an educational method rather than the sole purpose of the activity should be made clear.

(3) Hybrid engagement is possible and fruitful, however, in person attendance should be encouraged for at least some of the contact time to build connections between participants and mentors.

(4) Participants can vary widely in skill level in terms of domain-specific skills, game literacy, game design skills, pedagogic skills, and game development skills. Support materials should be tailored as closely as possible to the skill level of the intended participants and this should link to how the jams are targeted and framed. For domains other than cybersecurity, a card deck related to the learning objectives should be produced and organizers should also consider creating a small domain-specific 'provoking' game.

(5) Registration data on confidence as well as skill level could be collected to facilitate good team curation.

(6) Reflection time was crucial in allowing space for idea and asset generation. How the reflection time is structured and/or monitored is likely to be strongly affected by intended participants and may be instrumental to the success of a Serious Slow Game Jam.

5 FUTURE WORK

This paper focused on the design of SSGJ model, its motivations, reflections on the design and recommendations for future implementations. However, a detailed evaluation of the impact of the SSGJ model is forthcoming in a separate publication which uses quantitative results obtained from the aforementioned SSGJs to investigate: the impact on participants' understanding of cybersecurity and serious game design; the use and value of the cybersecurity, learning mechanics, and gaming mechanics card decks; the motivation and work-load levels of participants; and the impact of the 'slow' format of the SSGJ. Furthermore, as these jams focused on cybersecurity, participants may have been generally more aware of gaming and game design. Future work investigating how successful the SSGJ model is when applied to non-computing contexts would provide a beneficial insight into how participants from different specialities engage with the jam.

6 CONCLUSIONS

The SSGJ model is a carefully structured framework which aims to improve the rigour, accessibility, and quality of multidisciplinary game jams for serious games research. Although implemented to date with educational goals related to a specific domain, the model itself is domain agnostic and applies to any research within which multidisciplinarity and co-creation can be expressed through game development and/or design practice. The model builds on good practices in the field and the benefits associated with game jams, whilst being designed specifically for inclusivity, flexibility, and knowledge exchange. This results in a model that embraces a hybrid mode of engagement, a slower pace for conceptualization and production, and more emphasis on educational aspects to allow participants to develop a better understanding of key concepts and the nature and purpose of their serious game intervention. The SSGJ model was implemented at three events in 2021-2022 and reflections on their reception and efficacy imply that the 'slow' aspect of the jam model achieved its goals and that (mostly for logistical reasons) the model works best when offered as a complementary activity within an existing educational framework. A further, detailed evaluation of the impacts of the SSGJ model on participants and their serious game outputs is forthcoming.

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