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SERIOUS GAMES

HUMANITARIAN USER RESEARCH



IMAGINETIC
SIMULATION + DESIGN



Lessons Learned
Simulations and Training



EXECUTIVE SUMMARY



This report and the research which informs it are intended to explore the potential applicability of serious games and games-based learning to the humanitarian sector, particularly in the context of localization. Serious games are increasingly being adopted as training tools in other fields, but have seen slow adoption in the humanitarian sector (Brynen and Milante, 2013).

Why should humanitarian training teams employ learning games? Students are more likely to learn when they are interested in what they are learning (Garris et al., 2002). Serious games are demonstrably effective learning tools. Games have been found to be particularly effective in: promoting skill acquisition, knowledge retention, attitudinal change, supporting understanding of new concepts and ideas, shaping behaviour, and improving context-based problem solving (Klabber, 2003; Mateas, 2003; Prensky, 2001; Ricci, Salas, & Cannon-Bowers, 1996). The capacity to safely fail in serious games is a key component of their value as a learning tool. Failure has been identified as an integral part of learning (Anderson et al. 2018).

Through “real life” problem solving, serious games have the capacity to help humanitarian students more deeply understand and critically engage with important issues. Experiential Learning Theory and Situated Learning Theory help explain why this is the case. According to Experiential Learning Theory (ELT), individuals learn most from direct experience, active participation, and visible feedback on the consequences of their actions. Situated Learning Theory (SLT) likewise suggests that people learn better when placed in authentic contexts to perform actions that parallel real world tasks, interacting with others and applying knowledge. Games apply these theories by creating experiences that reflect real-life challenges, like how to manage employees with different personalities, and allowing the learner the opportunity to play through different situations. However, available research suggests

that games are poor standalone learning tools, and work better when used in coordination with a variety of teaching methodologies.

Methodology

The research which informs this report took place across six face-to-face workshops, conducted by an experienced facilitator in January 2020. Three workshops were held in Nairobi, Kenya, from 21-23 January, and three were held in Amman, Jordan, from 27-29 January. Each workshop was run with between 4 and 17 self-selected participants. Participants played through a selection of digital and tabletop games, after which facilitated debriefings took place. Participants were surveyed before, during and after the workshops. See Section “2.1 Research Overview and Design” for a complete breakdown.

Key Findings

- ◆ People demonstrated an ability to learn from games in the humanitarian context. Participants were able to recall lessons even long after the fact, up to 45 days after the workshops. Participants reported that engagement with games impacted their behaviour at work, their approach to work, and their relationships with beneficiaries even 45 days after the workshops.
 - ▷ See section “3.3 Effectiveness of Games-Based Learning in Humanitarian Work”



- ◆ Participants were eager to learn with games. Even participants who were not familiar with learning games were excited to try. Pre-existing “game literacy” was not a determining factor in the effectiveness of learning games.
 - ▷ See section “3.2 Perception of Games-Based Learning in Humanitarian Work”
- ◆ People felt that games were better teaching tools than PowerPoint lectures. 84.5% of participants felt that learning games were more effective than PowerPoint slides or lectures when learning the relevant subject matter.
 - ▷ See section “3.3.5 “Game Literacy” is Not as Important to Games-Based Learning as Expected”
- ◆ Interest in games and self-reported learning from serious games was not gendered: men and women were equally excited, engaged, and learning. Age proved to be a minor determinant of enthusiasm and engagement.
 - ▷ See section 3.1: An Overview of Participant Demographics
- ◆ Debriefing, contextualization, and skilled facilitation are essential to the learning process. Learning games should be accompanied by other teaching material. The presence of a skilled facilitator was important to supporting learning. In particular, a structured debriefing session was essential. For digital games, further study of how a debrief might be delivered through a learning app is recommended.
 - ▷ See section 3.3.6: Briefing, Contextualization, and Skilled Facilitation are Essential to the Learning Process

Potential Barriers to Learning

- ◆ Technological restrictions were a serious limitation for learners. Digital learning games should be explicitly designed with older technology and limited access to the internet in mind.
 - ▷ See section 3.4.1: Potential Barriers to Learning: Technological Challenges

- ◆ Language ability was a serious determinant of learning. Learning games are often only available in English, and often rely on detailed and complex instructions which must be well understood. Wherever possible games should be translated into the language of the audience.
 - ▷ See section 3.4.2: Potential barriers to learning: Language



- ◆ The additional time required for learning games was cited by many participants as a potential challenge for implementation in their offices. Wherever possible, learning games should be short and concise to minimize operational overhead.
 - ▷ See section 3.4.3: Potential barriers to learning: Time investment
- ◆ Skepticism of terms such as “games” and “gaming” among managers was cited by participants as a potential barrier for implementation of learning games in existing training programs.
 - ▷ See section 3.4.5: Potential barriers to learning: Buy-in from Management

Digital games vs tabletop games

This research included both digital and tabletop learning games. Both were found to have strengths, weaknesses, and trade-offs.

Digital games are harder to design well, more expensive to produce and revise, but easier to distribute and require less facilitation. Digital games can be easily played repeatedly, on demand and when convenient. They are best for shorter, simpler lessons that benefit from repetition.

Tabletop games are faster to design and revise, and can be corrected “on the fly” by an experienced facilitator. However, they are harder to distribute and facilitate. Tabletop games are better for immersive one-time experiences that focus on social interaction and complex problems.

- ▷ See section 5, “Digital games vs tabletop games” for a detailed comparison.

Best Practices in Learning Game Design

In the course of this project, the research team collected several “good practices” for learning game design. These suggestions do not represent a consensus among all learning game designers, nor should this list be considered exhaustive. However, these suggestions were supported by our research.

- ▷ See Section 6: Best Practices in Humanitarian Learning Games for a full discussion.

- ◆ **Only use a game when appropriate:** Learning games are more expensive and time consuming to develop than traditional learning tools. They should be employed thoughtfully to promote specific learning outcomes.
- ◆ **Get to the point quickly:** The longer it takes a learner to unlock a learning outcome, the more likely it is for a learner to abandon the game before achieving the designer’s purpose. This is especially relevant in contexts where participants are expected to engage with digital games independently.
- ◆ **Pay attention to the user interface (UI) and user experience (UX):** Learning is directly impacted by both user interface, or UI (how the player interacts with the game) and user experience, or UX (what the game makes the player think or feel).
- ◆ **KISSS Principle – Keep it Simple in Scope and Small:** Learning games are more effective when they are small in scope, clear in intent, and aim to teach a limited number of learning outcomes. Unnecessarily large projects or unintentionally complicated games can confuse learners.
- ◆ **Teaching the Reality rather than Teaching the Ideal:** Humanitarian learning games need to be attentive and responsive to real-life experiences and data, rather than designed around convenient assumptions. Learning games should explore how mistakes and errors are made, rather than avoid difficult issues.

- ◆ **Walk Before Running:** Designing learning games is time consuming and difficult, and applying them in humanitarian contexts is a new innovation. Starting with small, achievable projects will help build skill and minimize the cost of occasional errors.

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AUTHORS' REMARKS

**"THE CREATION OF SOMETHING NEW IS NOT ACCOMPLISHED BY THE INTELLECT BUT BY THE PLAY INSTINCT."
-CARL JUNG**

Play.

Learning through play is as natural as breathing. Across the living world, development depends on play. Children's socialization skills are learned through mimicry and play at a young age. In the animal kingdom, cubs and pups instinctively play to learn the survival skills they will need in their adult life. Play is essential to development.

Why, then, do we not play more?

Increasingly, industries and sectors are recognizing the powerful nature of learning through play in professional contexts, and the pedagogical potential of games-based learning. Professional gaming has been used in a military context for two centuries, and filtered through myriad sectors by the end of the 20th century and into the 21st. As technology has become more accessible, and entertainment games more popular, the envelope is being pushed and learning games are coming to the forefront of educational innovations, crossing even more boundaries.

More and more research is emerging, reinforcing the positive educational impact of games-based

learning. Herein, we explore just these issues, examining prior research and conducting our own study to inform the use of game-based learning techniques, specifically in a humanitarian context.

Through direct, facilitated play workshops, we explore front-line, local humanitarian workers' attitudes toward games-based learning, and compare them to their preconceived ideas about the endeavour. Then with contact touchpoints two weeks and 45 days post workshop measure lessons learned, and knowledge retained.

As we seek novel educational delivery systems to engage and challenge tomorrow's humanitarian leaders to become their best possible selves, we push them to develop the new ideas that will drive the sector forward. This crucible of creative, insightful thought, if it is to be nurtured and encouraged, needs an environment where ideas can thrive, be challenged and tested. Tomorrow's leaders need a safe-to-fail ecosystem of thought experimentation and creativity to evolve today's ideas into tomorrow's solutions.

Tomorrow's leaders need to play.

Tom Fisher & Matthew R. Stevens

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1. LITERATURE REVIEW

1.1 WHAT ARE GAMES & WHAT KIND OF GAMES EXIST?

We are all familiar with the word “game”. The word brings to mind a variety of ideas and experiences, from competitive sports to boards and counters on a table, traditional past-times like backgammon and mancala to the latest digital games. Some of us associate games with fun or excitement, others with boredom or confusion. Our understanding of games is shaped by our personal experience and preferences, rather than formal definitions. These preconceptions often shape our receptiveness to the utility of serious games for learning, analysis, and research. Unfortunately, these preconceptions are often counterproductive; too much skepticism, and we miss out on the unique benefits that serious games can bring. Too much enthusiasm, and we risk applying games in inappropriate ways because we think they are “cool” or “fun”. Defining terms--as best we can--is a starting point to formalizing the study and application of serious games to humanitarian work.

Much like other forms of media, games come in a wide array of forms and types, with different features and characteristics. Because of this, researchers, educators, and other practitioners have thus far struggled to agree on a precise and universal definition of “games”. One possible definition, suggested by Salen and Zimmerman (2006), describes games as “system[s] in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome” (p.80). While broadly applied in the literature on games, this definition may extend to activities which are not considered a game such as trading stocks and debate; it also overlooks how games might be cooperative. Others have defined games simply as a “structured form of play” (Flanagan 2009; Yalowitz, 1995). However, this fails to capture the complexity of games as compared to puzzles or play-acting. Moreover, “play” implies that fun is a defining characteristic of games, which fails to encompass the serious games that generate meaning without being “fun”. We opt to

employ Salen and Zimmerman’s definition as a general guideline, while simultaneously including any activity which is commonly referred to and accepted to be a game, understanding that game, as a concept, is socially constructed.

Games can differ in purpose, such as games for leisure versus games for learning. Games can also differ in scale (gamification vs learning games vs simulations), physical properties (analog vs digital), and structure. These distinctions between different types of games are important because they can influence potentially divergent costs, experiences and learning outcomes. Ultimately, deciding which type of game will best serve an instructor’s goals is about understanding the target audience, objectives, and constraining factors.

1.1.1 SCALE

Gamification

Gamification is when game elements are applied in non-game contexts. Common examples of gamification in society include retailers’ points-based rewards programs or organizations providing publicly visible, socially desirable awards for achievements such as medals or online “badges” to staff as motivation. In educational contexts, gamification is a teaching strategy that uses “game-based mechanics, aesthetics, and game thinking” to increase learner engagement, motivation, learning, and problem solving (Kapp, 2012, p. 10). For instance, the concept of “unlockable content” is a game mechanism which can be used in online learning modules to ensure learners have achieved a base-level understanding before they can move on to other content. The value of gamification has been proven even among highly-skilled adult learners in continuing professional development scenarios (Woolwine et al. 2019). Gamification can be useful in that it can often be less costly to incorporate game elements in current training than to develop a simulation or a serious game. That being said, gamification as a learning tool is mainly used by

GAMIFICATION



professionals to enhance and regulate learning. Because it is not a fully developed game, it does not come with some of its benefits such as an artificial environment under which players can perform tasks by trial-and-error or engage in large, dynamic interactions between multiple people. Moreover, gamification as studied so far is generally competitive (ie. inherently non-cooperative) with perceived “winners” and “losers”. It may therefore be less appropriate for training learners from organizational or ethnic cultures which prize community, cooperation, and consensus.

Serious Games

“Serious” games differ from other games by emphasizing knowledge production or knowledge transfer over simple enjoyment and entertainment. While most games are valued for being “fun”, serious games focus on generation of meaning beyond simple fun; this can include education, analysis, the production of emotion, the provoking of thought, etc. This is not to suggest that serious games and fun are mutually exclusive, but that fun is not the primary goal of the exercise. Serious games are often used to educate, train, and inform the people who play them.

Serious games are often designed around a real-world problem, emulating an aspect of the real world in an abstracted or simplified manner. Some common applications might include projecting a policy response during a crisis, workshoping supply-chain management for retailers or other businesses, examining military strategy in conflict, or stress-testing emergency preparedness plans. Serious game designers take a real issue and recreate it in a game setting so that users may “play” through the problem. “Serious games meet their objectives by including rules, constraints and activities that closely replicate the constraints of the real-world tasks that are being trained” (Ariffin et al. 2013). However, a good serious game is more than applying game characteristics such as scores and a narrative to a real-world problem. “It is the addition of pedagogy (activities that educate or instruct, thereby imparting knowledge or skill) that makes games serious” (Susi et. al 2007). Serious games are not a particular genre of game. Serious games may come in the form of a role-playing game, puzzle, strategy game, etc. Serious games address issues of different

scale such as learning the rules of airport security (micro) to developing policy response to a global pandemic (macro).

In this report and research, we are primarily interested in the application of serious games to learning, with a specific focus on humanitarian training in contexts of localization.

Learning Games

Although used interchangeably, serious games can be differentiated from “learning games” in that learning games aim to teach specific, often singular learning outcomes. Examples include “Muddy Motor Racing” which communicates the imperfect driving conditions in many areas where humanitarian services are delivered and challenges individuals to come up with ways to safely and efficiently dig the car out of the mud; and “Immigration Nation” where players learn about immigration laws and what makes someone eligible vs. ineligible to enter and live in the United States. Learning games are a subset of serious games. Learning games often possess a clear and linear structure in which gamers progress through the material after demonstrating a sufficient level of understanding.

In this research, we often interchange the term “serious game” and “learning game”, acknowledging that learning games are a subset of serious games.

Simulations

Simulations differ from serious games in that the primary purpose of simulations is to provide users with an experience that exactly models an aspect of reality such as a situation, scenario, or environment. “A simulation is a dynamic and simplified model of reality and it is judged by its realism, by its correspondence to the system which it represents” (Sauve et al. 2007). Serious games, while similar, are often abstracted depictions of reality in which players reenact specific parts of an experience such as strategic thinking, policy analysis, or procedure, without reproducing the experience as a whole, ie. in physical space, with actual tools. Games maintain essential attributes which separate them from a pure simulation, including: challenge, rules that allow the determination of a quantifiable

outcome such as a winner or loser, uncertainty, immediate feedback and assistance.

In humanitarian training, simulations are commonly used to train and test staff skills. These include applied emergency response activities such as search and rescue, safety procedures in hazardous environments, or the deployment of field medical equipment. Such simulations mimic reality via elaborate artificial settings and interaction with actors playing the role of injured persons, refugees, or kidnappers. The chief benefit of simulations is that simulations enable participants to behave almost exactly as if they were “in the field” within a safe environment without dangerous implications.



This is advantageous as “on-the-job learning” is considered the best method to consolidate new skills (Rumeser & Emsley, 2019), but can be very dangerous in high-risk environments. Similarly, it allows supervisors to identify individual staff members’ weak areas of knowledge so that further instruction may take place following the simulation. However, simulations cannot be tailored to varying levels of capability. Thus, beginners may find themselves unable to complete basic tasks within the simulation while more advanced users might find little challenge and a low-rate of failure. This prevents them from progressing past a certain point and acts as an obstacle to further learning. Moreover, simulations, especially the highly realistic ones, can be extremely expensive to produce and maintain. Although research suggests fidelity levels and knowledge transfer are not necessarily positively correlated (Feinstein and Cannon 2002; Norman et al., 2002), this finding in itself undermines the perceived superiority of simulations as tools for experiential learning.

1.1.2 ANALOG VS DIGITAL

Games can be presented via a variety of media. Today, the most common games are digital (games played using an electronic device) and analog (games that exist in the physical world). Digital games are delivered via a wide range of technological media, whether apps downloaded directly to mobile smartphones, web browser-based applications, computer games, console games (such as Playstation, Xbox, or Nintendo), or on other dedicated media. Analog games include role-playing and tabletop games (games which are typically played on a table such as board games or card games) including Monopoly, Dungeons and Dragons, and Poker.

Is One More Effective Than the Other?

There is contention within the literature on games-based learning on differences between analog vs digital presentation in facilitation of learning. Kaufman & Flanagan (2013) tested the difference in impact of the same public health game in digital vs analog form. They found that “that the digital version of the game, despite being a nearly identical translation of the analog version, proved significantly less effective at facilitating learning and belief change”. Cheng et al. (2015) similarly found that performance of reading comprehension (the desired learning outcome of their study) was significantly superior in the paper groups than the computer-based reading groups. However, Cheng et al. (2015) also found that those with higher technological familiarity performed better - leading them to conclude that learning outcomes from digitally based media can be improved with sufficient training. It is our opinion that the existing literature on digital vs. tabletop learning games favours tabletop gaming, but we stress that it is not conclusive, and in

particular fails to take into account the quality of digital implementation and whether particular learning goals might favour different media. In addition, digital games impart other real-world benefits, such as quick global reach (where technology allows) and reduced reliance on a facilitator. There is potential for reduced costs if a digital game is carefully implemented and properly scaled, but this is far from guaranteed; see the following section for more on financial considerations.

Financial Costs

There are different costs associated with the development and distribution of digital versus analog games. While digital games may be produced cheaply, poor-quality can suffer in a multitude of ways: they may not be technologically compatible, easy to learn, or even teach the intended lessons. Conversely, learning games can be very expensive and time consuming to develop well. A good quality digital game can be expensive to produce based on the inclusion of higher quality graphics, multiple players, and additional levels and activities, notwithstanding the complexities of developing an AI model capable of handling the permutations, nuance, and complexities of a humanitarian aid environment. This cost and time requirement means that digital learning games tend to be generalized to be broadly applicable to a wide range of contexts.

Analog games can be comparatively cheap and quick to develop, and are simple to customize, making them effective context-relevant learning tools. For example, “print and play” games can be transmitted electronically and easily printed and assembled in an office; all-in-one serious game development kits help to quickly develop scenario-specific games for any context and in any field office setting. Analog games tend to be more forgiving than digital games with respect to lower-quality game mechanics and components (Arnab et al., 2015), in part due to the on-the-fly support of the facilitator. Component costs for some analog games can prove to be a barrier as well: while digital games are far more expensive to develop, their distribution can be more cost effective--sometimes as simple as a download--when compared to the component costs, manufacturing costs, and transport costs for some analog games.



There is also a financial cost associated with playing digital versus analog games. A lack of access to technology or applications necessary to play a specific digital game (i.e. laptop, smartphone, headphones, internet, a sufficient graphics processing unit, flashplayer, etc.) poses an obstacle to game play since there may be significant economic costs associated with acquiring these components. For instance, games designed for newer/state-of-the-art mobile phones, for example, do not function on older or cheaper hardware. Thus, a target audience who cannot afford the newest iPhone will not be able to partake in the game play.

Organizational Costs

Analog games often require the simultaneous presence of multiple players and a dedicated facilitator, so independent or take-home learning is not usually an option. Analog games are thus associated with greater coordination efforts and potential costs.

However, in-person multiplayer games allow participants to learn from one another, both by directly observing how other participants react to decisions or actions, and sharing experiences

in a structured debriefing session. Because analog games are more typically (although not necessarily) facilitated by an instructor, including framing lectures, briefings and debriefing, learning outcomes can be much more carefully shaped.

Digital games, comparatively, may be played alone. As such, they tend to offer a very predictable experience, easy for learners to repeat if they are sufficiently motivated (as discussed previously in this report, repetition can vastly boost retention of lessons). The option to run digital games alone, however, means that participants are not able to learn from each other during and after the game. To our knowledge, there is no digital equivalent to an in-person debrief. In debriefing, lessons may be highlighted during peer discussion or with an experienced facilitator. Digital games are also less effective at modelling the dynamism of social or political interactions in such a way that users can directly observe and learn from them. The US Army, for example, has experienced this shortfall of digital games. Games such as UrbanSim have been created with much fanfare and large budgets, only to be shelved because they were found to be insufficient to meet training needs (Vogt, 2011)

1.2 WHY GAMES?

1.2.1 LEARNING THEORIES SUPPORTING THE USE OF GAMES

The increasing number and scale of complexity of multi-stakeholder issues in the humanitarian profession has given rise to new ways of thinking about knowledge dissemination and the need for “a mutual learning loop framework that integrates different learning theories, such as experiential learning, adaptive management or transformative learning.” (Lavell et al, 2015, p.1013) Through “real life” problem solving, serious games have the capacity to help humanitarian students more deeply understand and critically engage with important issues. Experiential Learning Theory and Situated Learning Theory help explain why this is the case.

According to Experiential Learning Theory (ELT), individuals learn most from direct experience, active participation, and visible feedback on the consequences of their actions. Experience provides the individual subjective meaning to abstract concepts and creates a concrete point of reference for testing the implications of ideas created during the learning process (Kolb, 2000). Games foster experiential learning through features such as active participation where players not only perform actions but directly experience the effects of their choices. Games are active forms of learning, as opposed to passive lectures or videos, which do not require much action from the learner, aside from watching, listening, and possibly taking notes. Situated Learning Theory (SLT) likewise supports game-based learning as it posits that people learn better when placed in authentic contexts that parallel real-world tasks, interacting with others rather than receiving knowledge that they are expected to apply later. Games apply this theory by creating experiences that reflect real-life job issues, like how to manage employees with different personalities, and allowing the learner the opportunity to play through different situations.

1.2.2 ENGAGEMENT: INTRINSIC VS. EXTRINSIC MOTIVATION

People are more likely to learn when they are interested in what they are learning (Garris et al., 2002). This is because they become intrinsically motivated to learn--they are excited to learn for the sake of the lesson. According to Garris et al., intrinsic motivation (i.e. the learner engages in an activity because it is enjoyable) is found to be a stronger driver of performance than extrinsic motivation (i.e. the learner engages in an activity to satisfy a desired outcome, such as grades or financial gain). Intrinsic motivation encourages a higher degree of effort and longer-term performance (Pinder 2011) as compared to extrinsic motivation; this is because extrinsic motivators (rewards that are tied to expectations of gain or fear of loss such as benefits, money, stability, etc.) are motivating only to the extent that an individual believes achieving the incentive is useful and only up until the point that they have attained the incentive. Individuals who are extrinsically motivated will thus be more likely to put in the "bare minimum" in a bid to receive their desired reward as quickly as possible. In a humanitarian training setting, this may present itself as a trainee learning enough material to achieve the minimum score to pass an evaluation. Contrastingly, when individuals are intrinsically motivated, they are more likely to fully endorse and participate in the task and will persist in performing the task beyond the point at which they are rewarded. This also increases the quality as well as quantity of what has been learned.

The method by which instruction is delivered has been shown to elicit student engagement during training (Garris et al. 2002). In recognition of this, organizations from a wide variety of sectors are increasingly incorporating serious games in their training programs to help stimulate intrinsic engagement toward company education. The rationale guiding this new method of instruction is that the feelings of excitement, challenge, and achievement which trainees experience while playing a learning game will encourage an intrinsic motivation to learn, inspiring deeper engagement with the material. Characteristics of games which make them engaging include competition, challenge, rewards, pleasing aesthetics, surprise, etc. Part of the draw to learning games is the simple expectation that games are fun, however, the sense of engagement that learners experience

involves many elements intrinsically related to the lesson. These elements which engage players include: capturing and maintaining their attention, provoking thought and enabling curiosity, creating social connection, providing learners with an immediate sense of accomplishment and gratification, etc. Games' unique characteristics are therefore particularly effective in harnessing individuals' intrinsic motivations as compared to other methods of teaching (Birk et al. 2016; Garris et al. 2002).

1.2.3 ENVIRONMENT: A SAFE SPACE TO FAIL

New employees inevitably make mistakes their first time on the job, regardless of the extent of preparatory training carried out in the classroom. In a humanitarian setting, these mistakes can have severe human costs in addition to other undesirable outcomes such as negative social experiences and fiscal loss. Because error is inevitable, it is beneficial to stakeholders in humanitarian work that prospective employees be able to make mistakes in an environment where the impact of their errors will be mitigated. Games in this case are an ideal training tool because they are able to artificially recreate aspects of the real world, recreating to some degree the environment in which employees will be working. Thus, when participating in a learning game, mistakes that staff might otherwise have made while on the job can instead be made (and learned from) in advance. Moreover, the feedback from the game allows instructors and students alike to identify and correct gaps or errors in students' knowledge.

The capacity to safely fail in serious games is a key component of their value as a learning tool. Failure has been identified as an integral part of learning (Anderson et al. 2018). Sitkin (1992) argued that "failure typically represents an exception that does not conform to expectations and thus requires more active, deeper processing" (p. 237). This is because when we encounter experiences that do not fit our preconceptions (i.e. trying something and failing), we are forced to adapt our understanding to account for gaps in our knowledge. This process of critical reflection has a stronger psychological impact than having gotten it right the first time. Games in particular promote better learning from failure than other instructional methods. Game mechanics such as having to replay a level until

a sufficient understanding is displayed or the emotional impact of losing the game reinforces the learning outcomes better than traditional instruction methods and evaluations such as videos and quizzes.

Creating a safe-to-fail environment is useful not only in training and preparing staff members more effectively, but is useful in developing better practices and new innovations. Games make failure into a productive experience by allowing players to take risks and deviate from regular procedure and try new things. The ability to compare and contrast ideas, explore different methods, and elaborate on established approaches all encourages "outside-the-box" thinking. This process of experimentation is critical to successful innovation. In the humanitarian setting where problems are complex and continuously evolving, it is critical that humanitarian practices effectively adapt with the issues. Games can provide the opportunity to test and develop new strategies to deliver, coordinate, and procure aid without posing harm to relevant beneficiaries or stakeholders.

1.2.4 EFFECTIVENESS: PROVEN TOOLS FOR LEARNING AND ASSESSMENT

Serious games have been demonstrably effective learning tools. While this is not an exhaustive list, games are found to be particularly effective in: promoting skill acquisition, knowledge retention, attitudinal change, supporting understanding of new concepts and ideas, shaping behaviour, and improving context-based problem solving (Klabber, 2003; Mateas, 2003; Prensky, 2001; Ricci, Salas, & Cannon-Bowers, 1996). Games are also considered an effective form of assessment as they require application of knowledge (as opposed to memorization and recital of facts) and provide real-time feedback (i.e. game progress, losing, in-game scores, etc.) on how well knowledge is applied and skills are enacted - allowing instructors to measure the level of an individual student's ability.

Attributes of games that contribute to learning include active participation, immediate feedback, dynamic interaction, cultural context, competition, the exchange of tacit and explicit knowledge, novelty, anthropomorphism, and goal direction. Below is a list of learning outcomes that games

do well and why:

- ◆ Decision-making: Decision-making in complex and high-stress environments is simulated by game mechanisms such as time pressure, competition, disruptors, and concentration of audio-visual stimuli. The numerous decision-making opportunities presented in a single game enables players to practice and improve how they collect and process information from their surroundings.
- ◆ Retention: Repeated engagement with interactive drill-and-practice games provides the repetition that may be needed for learners to memorize and retain certain types of content.
- ◆ Problem-Solving: In-game challenges require students to think critically in order to solve them and games' use of competition and rewards act as incentives to encourage students to overcome game problems.
- ◆ Collaboration: Games in which there are teams or it is necessary to collaborate with other players in order to succeed can foster and develop collaborative skills such as task coordination, clear communication, and compromise.
- ◆ Empathy: Role-play in games allows players to inhabit the lives and vicariously experience the disadvantages or persecution faced by other people or groups. This can induce empathy by challenging misconceptions; providing previously unrealized information; and arousing emotion through immersive experience, encouraging players to relate to the group whose perspective they are embodying.

Although there is widespread consensus on the anecdotal benefits of serious games for learning, empirical research is limited. Conrad (2010), Connolly et al. (2012), and Marcos et al. (2016) highlight that there is insufficient research evaluating the effectiveness of games in learning. The majority of claims advocating games-based learning are based on anecdotal evidence of their effectiveness and instructor judgement. The

lack of evidence for the effectiveness of games for training purposes is further compounded by the lack of a well-developed methodology for evaluating the effectiveness of games. The assessment of serious games is largely hindered by their complexity, the difficulty in measuring intangible variables (i.e. engagement), and a lack of organization among a fragmented community of various stakeholders. In our review, a significant portion of the available studies evaluating the effectiveness of games as learning tools used a simple research design which produced subjective and short-term results such as asking participants if, in their opinion, they had learned something. Many studies lacked rigorous testing methods such as a control or another group of comparison, pretests, and testing against their declared objective. Our assessment of the literature is corroborated by the findings of Wangenheim & Shull (2009), Hayes (2005), and Bellotti et al. (2013).

Available research suggests that games are poor standalone learning tools. Learning outcomes are most significant when games are used to complement, not utterly replace, other instructional methods (Sadler et al. 2015; Schmitz et al. 2015; Hayes 2005; Virvour et al. 2005). Randel et al. (1992) reviewed 67 studies comparing the instructional effectiveness of games versus conventional classroom instruction. They found that 56% showed no difference and 32% found differences favouring games. Wangenheim & Shull (2009) reviewed some 21 studies in serious games for software engineering training and found that a majority had a noticeable but a minor impact on learning. Hays (2005) review of 274 papers on instructional effectiveness of games likewise found that games can be effective for learning specific subjects and skills such as math and collaboration, the majority of studies found no significant difference between games and conventional teaching.

One of the key limitations of games is the inevitable simplification of circumstances, which is inevitable in the recreation of complex scenarios. Not all elements can be incorporated or recreated and attempting to include too many details can be overwhelming for a player and result in making the game too convoluted to play.

1.3 EFFECTS OF GAME DESIGN ON GAME-BASED LEARNING

For serious games to achieve their intentions, serious attention must be paid to game design. Pre-existing empirical research indicates that serious games are only effective if they are designed with specific instructional objectives in mind and the features of the game encourage the achievement of those objectives (Hodent, 2018). Features such as user interface design, teaching strategies, and the format and content of educational material influenced by the game developers. The choices made by the game designer will have implications for the degree of effectiveness of the game as a learning tool. Our review of game design as it affects the educational value of games finds that the major issues concern the apparent difficulty in balancing pedagogy and entertainment, inadequate debriefing and facilitation, and neglecting diverging player characteristics. Effective games for training should be developed with their specific learning objectives and target audience in mind.

1.3.1 EDUCATION VS ENJOYMENT

The biggest challenge of serious games development is the integration of learning content and pedagogy with core game mechanics. The prevailing inability to achieve a cohesive balance between enjoyment and education has limited the effectiveness of games as learning tools. For instance, in designs where the game mode is dominant, games can cause defective learning. In our review, we found that where games were designed with an emphasis placed on being a “fun game”, learning outcomes were either found to be wrong or missing altogether. For example, in a history simulation-game *The Oregon Trail*, Caftori (1994) found that the educational objectives of the games were missed by students because the incorporated game design elements, such as scores based on the hunting of animals and a time pressure to finish the trail, did not align with the games’ learning objectives of teaching users about the terrain and wildlife on the Oregon Trail. It is not enough to embed attractive characteristics in the game because these can easily become diversions from the real goals. It is necessary to emphasize important information in the game and choose game mechanics that ultimately support the instructional objectives. However, in

designs where education greatly supplants game aspects, users often find the game unplayable. For example, in their 2008 study, Virvou & Katsionis found that not liking the game or finding the game unusable were fundamental stumbling blocks to learning. Issues related to likeability and usability such as poor game aesthetics, monotonous tasks, etc. can be alienating to players and undermine the key factors supporting game-based learning such as engagement and motivation. Clearly it is necessary to strike a balance between learning theory, game design, and subject matter expertise.

1.3.2 DEBRIEFING & FACILITATION

A school of thought posits that learning from games is only effective - or at the very least, more effective - with instructor support and debriefing (Crookall 2014; Kolb, 2008; Kris, 2003; Thatcher, 1990). It is unreasonable to assume that no learning whatsoever occurs during the game itself. Rather, learning is strengthened and becomes more meaningful through the debriefing process. Debriefing is the process of reflecting and discussing the game experience to turn into learning. Participants often have a limited picture of what happened; while playing the game, participants predominantly observe only what their position allows them to. Post-game debriefing and reflection sessions help elucidate the learning material and place the game-learning experience into a greater context. Serious games which address complex, multi stakeholder problems may trigger strong emotional reactions, provoke conflicts between participants or misunderstandings. Finally, debriefing ensures all participants exit the session with the intended knowledge. It allows instructors to identify missed, weak, or false learning outcomes based on the participants’ self-reflection on what they have learned from the game. At times, participants may not themselves be aware of the knowledge or skills that they have acquired. The debrief provides trainers with the opportunity to reiterate and reinforce desired learning outcomes. Likewise, instructional support helps learners to use the game effectively, enabling gamers to focus on the instructional information rather than the rules and requirements of the game (Hays, 2005). The presence of a facilitator precludes a negative experience by offering space to air emotions,

clarifying issues, and resolving any conflicts among participants. If an unseen design flaw in a tabletop game begins to result in unrealistic outcomes, an experienced facilitator can easily “correct” the flow of the game via injects to re-establish a user experience which mirrors that of real life and demonstrates the desired learning outcomes.

1.3.3 EFFECTS OF PLAYER CHARACTERISTICS

One of the most important considerations in game design is the makeup and complexion of the game’s target audience. Player characteristics, generational and cultural differences, and individual learning styles are just some of the factors that can affect players’ receptivity to any given serious game.

Familiarity with Games

The effectiveness of games for educational purposes are affected by the playing audience’s familiarity with games. In several studies, participants who were considered inexperienced gamers did not learn as well as more experienced gamers (Ravsyse et al., 2016; Virvou and Katsionis, 2008). There are several reasons for this, including: a dislike of games in general, confusion leading to alienation, and an inability to play the game properly. However, studies have found that clear and concise instructions, simple user interfaces, and lower game complexity can resolve issues that arise from non-gamers (Couceiro et al. 2013).

Generational & Cultural Differences

Generational and cultural differences can affect willingness and understanding (technological literacy) in terms of learning through games. Older and younger workers “do not respond the same way to training” (Grossman, 2008, p. 43) and, as a result, game designers should build games to be as accessible as possible to a wide range of people; it is not enough to assume that players will be intrinsically motivated by the label of “game” or the promise of “fun” alone. Furthermore, little attention is given to issues of cultural diversity in serious games. Rasyse et al. 2016 reviewed 45 serious games for disaster risk management and their respective literature and found cultural implications were distinctly

absent; only a few mentioned “bridging the gaps between people of different cultural and linguistic backgrounds to better manage risks”. This lack of cultural competency in game design can have a significant impact on the player’s receptivity towards the method, as well as its effectiveness.

1.4 SERIOUS GAMES IN HUMANITARIAN CONTEXTS

Serious games remain an underused tool in humanitarian training, especially when compared to other fields dealing with similarly complex multi-stakeholder problems such as peacebuilding, medicine, disaster risk management, and security. Where serious games have been applied in the humanitarian context, they are more frequently employed as advocacy and awareness-building tools for public consumption rather than training tools. These advocacy games tend to be targeted at potential small-scale donors rather than humanitarian workers themselves, and focus on the building of general empathy and “feel-good” interest in humanitarian projects rather than specific learning about contexts or skills. Few serious games have been developed for or applied to humanitarian response, with little public data available on design, application, educational effectiveness, lessons learned, or best practices.

1.4.1 ETHICAL CONSIDERATIONS

Any discussion of serious gaming in humanitarian contexts must be prefaced with an acknowledgement of the ethical considerations of such a venture. Implementing serious games on subjects of human or natural disasters, and the resulting depiction of suffering, poverty, liminalization, exclusion from the national order, and all associated hardships requires a deep sensitivity towards the context. In this sector, we must be explicit in the difference between “gaming” for fun and serious games as powerful training tools. Serious humanitarian games must be executed with a strict adherence to respect for the people and communities affected by the topic being simulated.

While there is little written about ethical considerations in serious humanitarian games,

there is extensive literature on the importance of engaging ethically in humanitarian work, both for researchers and practitioners in the field (see for example, Clark-Kazak 2017; Hyndman, 2000; Malkki 2013). In her seminal piece “Can Humanitarian Work with Refugees Be Humane?” Harrell-Bond (2002) refers to the need for a “rights-based humanitarianism” that moves beyond the charity model and upholds the dignity and rights of the communities they hope to serve, moving away from the ‘victim’ narrative framing of so many organizations. These academic principles have recently been enshrined in the Sphere Standards and Core Humanitarian Standard (2018).

The application of ethical principles in the development of serious games should be foundational to their design, especially in the context of humanitarian work where wildly disparate power dynamics between ‘stakeholders’ and ‘beneficiaries’ already exist. Lessons Learned Simulations & Training, which primarily works in refugee-response contexts, has developed a series of principles to consider in the design and delivery of serious games with respect to forced displacement:



1. Telling ‘the story’: there is a tendency in humanitarian response work to represent refugees’ individual life stories as a singular experience, essentializing the individual as a victim in a position of dependency. The foil of the unified ‘refugee story’ is the solutions-based humanitarian organization. When designing and implementing serious games in humanitarian contexts, it is important to problematize this binary. Who is telling the story, and to what end? What mistakes do humanitarian organizations make, and how can serious games contribute to the identification, description, and reduce the frequency and severity of those mistakes? Serious games have the capacity to engage with the complexities of different experiences and consequently offer up more nuanced solutions. Dignified representation: unlike a purely fictional game, serious humanitarian games are based on real-life and often ongoing crisis scenarios that are lived by real people. There are clear benefits to experiential learning experiences, both

for understanding the complexity of the topic and in terms of identifying solutions or learning particular skills. However, it is vital that serious games that engage with humanitarian contexts are centered on principles of respect and dignity, especially when representing people receiving humanitarian interventions. Ideally, voices of members of the affected community should be directly involved in the development of the simulation.

2. Avoid abstraction of voiceless stakeholders: it is common in serious game development that “voiceless” stakeholders are abstracted as a mechanical function. For example, in a military learning game on the functioning of provincial reconstruction teams in Afghanistan, the only played roles are military, government, and humanitarian actors; local populations, displaced people, and militants are represented via the “flip of a card” (Mason and Patterson, 2013). While the game successfully teaches participants about some stakeholders in the Afghan conflict, it fails to explore those who are inarguably the most impacted by the ongoing violence. Abstracting voiceless actors encodes their liminality into the games’ approximation of reality. Not only does this reinforce the assumption that they are unimportant, it presents these actors as irrational, unknowable, or random, and misses an extremely valuable analytical opportunity to understand a scenario from that perspective.

3. Biases and assumptions: there is a risk of ‘encoding’ biases and assumptions into the design and implementation of simulation exercises. These biases can be represented in a narrative sense (how roles are described) or a mechanical sense (how the game functions). Mechanical biases, where the functioning of a serious game is internally coherent but does not accurately represent the real-life process, is particularly dangerous as participants can leave the game having

strongly reinforced lessons which in this case would be incorrect. While some bias is inevitable, actively watching for and recognizing these dangers are integral to minimizing their impact. One way to monitor bias is to develop detailed role descriptions based on well researched realities about the scenario situation (this can include accurate representation about the humanitarian context and the various ‘players’ involved). Another is to acknowledge the limitations of the game. For example, a serious game on refugees in urban contexts represents a very different space and scenario than a refugee camp in Dadaab; the lessons learned in one context cannot necessarily translate to another.

1.5 GOALS AND STRUCTURE OF SERIOUS HUMANITARIAN GAMES

The broad learning outcomes of serious games should shape their design structure, and can be a useful tool of classification.

Broadly, in the humanitarian context, serious games can be differentiated based on whether they aim to advocate or build awareness around an issue or cause, or whether they are designed to teach specific skills.

Advocacy games are designed to change the opinions of their participants. Advocacy games often (although not always) focus on narrative, and may “tell the story” of people in a crisis. A “choose your own adventure” structure is common among games in this category.

Advocacy games may also be structured as a loosely gamed experience in which players carry out actions which are in no way related to the cause. In theory, players will be drawn to the game simply because it is engaging to play, and learn lessons about humanitarian agencies or crises via extrinsic repetition. In practice, these games are very difficult to execute effectively, as they are in direct competition with extremely high-budget commercial products.

Conversely, serious games can be developed to

teach particular skills, demonstrate the structure of challenges, or detail the functioning of specific systems. These can focus on specific skill-sets (for example, logistics/supply chain management, Sphere Standards, camp management, needs assessment or MEAL best practices, cluster coordination), or present insight on more strategic approaches to achieve humanitarian outputs (for example, a study of information flow between stakeholders, analysis of crises from various viewpoints, decision-making in times of crisis). There unfortunately are few examples of humanitarian games which fall into this category.

1.5.1 “DOING YOUR JOB” VS STAKEHOLDER ANALYSIS

Learning games and simulations can broadly be categorized by player roles: in many humanitarian learning games (and simulation exercises), participants take on the same roles that they fill in the real-life humanitarian hierarchy. This is a logical approach: it clearly has the explicit benefit of helping players to learn lessons that are directly applicable to their own jobs. However, there is an undervalued benefit in participants taking on other roles, whether they are different positions in their own organizations, or other stakeholders entirely--chiefly members of the affected community, but also members of other organizations, donor, local government representatives, etc. These exercises provide deeper insight into the decision-making processes of other individuals in the humanitarian system, which also has a direct impact on how humanitarian workers approach their work. While there are certainly pros and cons of taking on one’s own role (learning the specific mechanics of your own job better) vs. taking on the roles of other stakeholders (better understanding other people’s point of view), little research to date has been done on this topic.

1.5.2 SIMEX, SCENARIO BUILDING, AND SERIOUS GAMES

The Simulation Exercise (commonly referred to as “SimEx”) is a well-established learning tool in humanitarian contexts. However, SimEx have a few notable distinctions from serious games, and as such their learning outcomes are different.



In a typical SimEx, participants often:

- ◆ Take on their own jobs (or desired jobs) as roles, sometimes at their own daily workstations;
- ◆ Recreate the steps of their jobs with a very high fidelity, including field work such as emergency search and rescue or safety in hazardous environments;
- ◆ Follow a rigid and well-established narrative, and rely on scripted injects to drive forward that narrative;
- ◆ Demonstrate success by reproducing established policy and practice;
- ◆ Experience “immersive” emotional and physical reactions to crises, such as stress, fear, shock, etc. (WHO SimEx Manual).

SimEx exercises can be very expensive and time consuming to design, run, and evaluate. They can involve multiple physical locations and the contracting of actors to take on roles of stakeholders outside the sponsoring

organization (members of affected populations, local government representatives, armed groups, media, etc)

Simulation exercises are powerful tools for training and testing the preparedness of individuals in an organization to respond to an unusual crisis along existing policy guidelines, and to look for weak points in existing policy. They prepare participants for the emotional and physical stresses that may take place in emergency scenarios, such as moments of violence or serious accidents.

However, there are several learning outcomes which serious games can achieve which traditional SimEx typically do not. Serious games in humanitarian contexts encourage:

- ◆ Integration of new knowledges and understandings, such as appreciating or experiencing a crisis from the viewpoint of another;
- ◆ Creativity and critical thinking skills in moments of crisis;

- ◆ Experimentation within a “safe space to fail”;
- ◆ Allowing participants to take on different roles to better understand the functioning of a crisis response (either more senior roles within the organization, roles in other organizations, or roles of other stakeholders such as government, donors, and target communities);
- ◆ Understanding “the big picture” in a crisis, reaching beyond individual or organizational roles to see how agencies interact;
- ◆ Experience some “immersive” emotional and physical reactions to crises, such as stress, fear, shock, etc, but are less intense than in a traditional SimEx;
- ◆ Serious games (in particular, analog games) are significantly less expensive and time consuming to design, run, and evaluate.

Conversely, in scenario-building exercises, participants tend to explore the roles of other stakeholders, such as political and military actors, displaced people in a less structured manner than a serious game. While both involve very similar aims and approaches, scenario-building exercises tend to involve open discussion among experts around potential paths of evolution of a crisis. Serious games, on the other hand, involve participants who may or may not be experts exploring potential paths via interaction with a pre-determined model.

When compared to scenario-building exercises, serious games are:

- ◆ Somewhat more complicated to design and implement;
- ◆ More completely explore second and third order consequences of decisions;
- ◆ Help to “frame” a scenario from several viewpoints.

In particular, Simulation Exercises are rigid and structured, and tend to reproduce existing understandings or narratives of humanitarian response. Serious games are fluid and flexible, with the potential to encourage critical engagement with established humanitarian norms. Depending on the learning goals of the exercise, one tool or the other may be preferable.



“You relate to the beneficiary, instead of being on this other side of always doing things for them.”

-Participant, 22 Jan 2020

2. RESEARCH METHODOLOGY

2.1 RESEARCH OVERVIEW AND DESIGN

The overall purpose of this research is to gather robust data on the interest in and applicability of serious games in humanitarian contexts. This data will ultimately serve Save the Children UK and other humanitarian organizations in designing and implementing appropriate learning innovations.

2.1.1 RESEARCH QUESTIONS:

- ◆ What are the perceptions of local humanitarian staff in Jordan and Kenya of serious games as a learning methodology?
- ◆ How do these perceptions change before and after participating in facilitated mobile learning games, and tabletop learning games?
- ◆ How do participants' behaviour and/or attitude change after participating in facilitated and unfacilitated mobile learning games, and tabletop learning games?
- ◆ Do these changes in behaviour and/or attitude diminish over time?
- ◆ Does a digital or in-person tabletop exercise influence changes in behaviour and/or attitude?
- ◆ What are the potential barriers to engagement with mobile-based and tabletop serious games as a learning tool (especially technical barriers)?
- ◆ What are the practical requirements necessary to roll-out mobile and/or tabletop serious games to learners working in an emergency setting?

2.1.2 SETTING

We have selected two field sites based on the presence of Save the Children regional offices and to draw on previous experience of our research team: Amman, Jordan and Nairobi, Kenya. While both sites are connected to protracted, emergency situations, they represent unique characteristics of place. Jordan is viewed as a country of first asylum, hosting a majority of urban refugees primarily from Syria and the surrounding region, but including a range of minority groups from Iraq, Sudan, Yemen. Kenya, conversely, primarily operates on a policy of encampment, and is host to several major refugee camps, including the world's oldest and largest refugee camp in the world. Both are hubs for humanitarian organizations working in their respective regions.



2.1.3 SAMPLING

The same methods were employed in both locations and the research was administered by the same researcher. Purposive sampling was used to select participants, who are primarily local/national staff for NGOs in the humanitarian sector. Some international staff members have also been included in the research. Participants have voluntarily signed up to participate in the study via online recruitment. The invitation to register was advertised through various online networks, including SCUK professional networks, the professional networks of our research team, and via public announcement on prominent professional groups on social media sites such as Facebook.

2.1.4 DATA COLLECTION

Participants took part in at least four games from a selection which have been identified by the research team as applicable to the research aims.

The majority of these games are digital (either via smartphones/tablets or laptops), while two are analogue "board" games.

The games have been selected to cover as wide a range as possible of learning outcomes while remaining relevant to humanitarian work. The selected games are designed by a variety of organizations; notably, the two analogue games were each individually developed by the organizations making up the research team, Lessons Learned Simulations and Training and Imaginetic. As this is initial exploratory research, none of the selected games were produced by SCUK or affiliated organizations.

Six workshops took place between the 21st and 29th of January 2020. Workshops consisted of up to 15 participants each. Support facilitators were recruited from applicants, and took part in some activities.

Participants were surveyed before, during, and after the workshop. Surveys were digitized (with paper back-ups) to facilitate data collection. Surveys focus on three major topics:

- ◆ Acceptance of games-based learning as an educational methodology
- ◆ Attitudes and behaviours in humanitarian contexts
- ◆ Technological barriers to digital learning

Each participant was invited to contribute to all parts of the research study: the gaming sessions, associated in-person debriefings, and well as a series of surveys. Surveys have been designed to address the proposed research questions. The research schedule was as follows:

1. Pre-Exercise Survey: completed before the workshop
2. Games-Based Learning Workshop:
3. Digital Game #1: Forced to Fight or Bury Me My Love

4. Digital Game #2: At-Risk or Liyla and the Shadows of War
5. Digital Game #3: Mission Zhubia
6. Analog game: Aftershock or The Day My Life Froze
7. Post-Exercise Survey: completed after playing 3 digital games, and again after the analog game
8. Group Debriefing: designed as a focus group. Notes and audio recordings were taken during the debriefing.
9. Post-Debrief Survey: completed after each debriefing
10. Post-Exercise Survey #1: completed 14 days after the workshop
11. Post-Exercise Survey #2: completed 45 days after the workshop

Findings from this research will be augmented by data collected through concurrent research on Aftershock: A Humanitarian Crisis Game, carried out by Imaginetic with undergraduate students from McGill University in Montreal, Canada. While these workshops represent independent research carried out by Imaginetic, data collection has been structured to be compatible with the international workshops funded by SCUK. Imaginetic has graciously offered to share this data where applicable.

2.1.5 DATA ANALYSIS

Data analysis followed a typical mixed methods approach, combining elements of qualitative and quantitative research.

The research team took detailed notes during and after the workshops to qualitatively explore how participants engaged with the learning material. The debriefings were audio-recorded to allow for transcription of conversations wherein the

experiences and reflections of participants were discussed, analyzed, and placed into context.

Survey data was statistically analyzed based on both responses and changes in responses over time before, immediately after, and several weeks after taking part in the learning games. The survey schedule was carefully structured in order to:

- ◆ Observe whether learning games can change attitude and behaviour (before/after)
- ◆ Test how lessons learned from games are retained over time (the “forgetfulness curve”)
- ◆ Compare the effectiveness of digital and analog games
- ◆ Analyze the importance of debriefing to achieving learning outcomes

By repeating questions on learning outcomes over time, the research team was able to assess changes in attitude and behaviour on various humanitarian issues before, immediately after, and in the weeks following the games-based learning workshops.

2.2 LIMITATIONS AND RECOMMENDATIONS FOR FURTHER STUDY

There are several key limitations to this study.

1. This study involved a relatively small sample size (54 participants actually attended the free workshops out of a potential 90; response attrition occurred at every step of the process). With more time and resources, the research could also be expanded to other sites.
2. Because of the relatively small sample size, the decision was made for all participants to take part in all learning games. With more participants, further research could be done to compare the effectiveness of particular learning games.

3. Despite a pre/post survey structure wrapping the debriefing session, this study will not fully explore the effect of unfacilitated games-based learning.

4. This study does not compare how games-based learning, traditional lecture-based education, or a blended series of lectures and games impact successful learning outcomes.

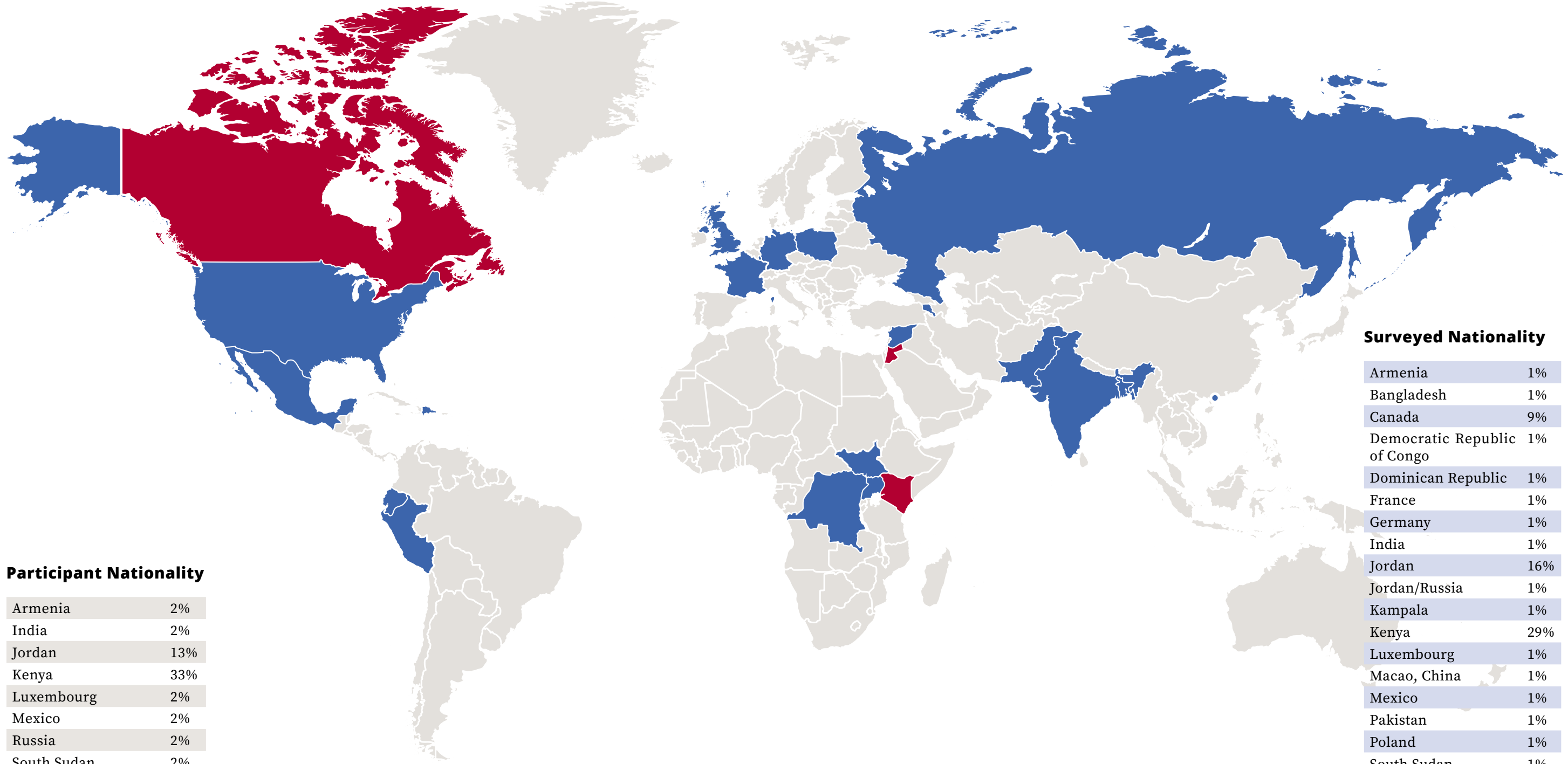
5. A follow-up study conducted online and remotely with a detailed e-learning guide but without in-person facilitation would emulate some applications of future learning games (eg, implemented as a part of MOOCs).

6. Aftershock is a learning tool designed by Rex Brynen, developed by and Tom Fisher of Imaginetic, and The Day My Life Froze is a learning tool developed by Matthew Stevens of Lessons Learned Simulations and Training. These learning games were included to take advantage of the research team’s unique access to proprietary learning tools. The research team did not intentionally privilege Imaginetic or LLST learning games over the games of others

7. In circulating the final 45-day survey to some participants, preliminary statistics from previous surveys were included in the body of the email with the intent of helping to reduce response rate attrition. However, this inclusion represented an error in methodology and may have contributed to positive skew in responses. Data from affected surveys was therefore not included in the main body of analysis, and where any potentially influenced data was referred to it has been flagged where used.



3. RESEARCH OUTCOMES



Participant Nationality

Armenia	2%
India	2%
Jordan	13%
Kenya	33%
Luxembourg	2%
Mexico	2%
Russia	2%
South Sudan	2%
Uganda	2%
UK	2%
USA	2%
Not Stated	36%

Surveyed Nationality

Armenia	1%
Bangladesh	1%
Canada	9%
Democratic Republic of Congo	1%
Dominican Republic	1%
France	1%
Germany	1%
India	1%
Jordan	16%
Jordan/Russia	1%
Kampala	1%
Kenya	29%
Luxembourg	1%
Macao, China	1%
Mexico	1%
Pakistan	1%
Poland	1%
South Sudan	1%
Syria	1%
United Kingdom	1%
USA	1%
Not Stated	29%

Figure 1: Demographics: Participant Nationality

3.1 AN OVERVIEW OF PARTICIPANT DEMOGRAPHICS

The workshops drew a diverse group of participants, from 11+ different countries (36% of participants declined to provide their nationality) and ranging in age from 22 to 50. Kenyans and Jordanians made up the majority of participants in each country respectively, but participants from nearby countries, from local refugee communities, and from EU countries and the United States also took part. Participants were largely women (65%), reflecting the broader skew in gender towards women across the humanitarian sector. The group included a people with a wide range of educational backgrounds, primarily bachelors and masters degree holders.

Coming into the workshop there were only small differences in participants' attitudes toward games. Overall, there was a slight predisposition for a minority of older people to be less enthusiastic about games, in particular digital games (see more in the following section), but participants of all ages reported being positive towards games in general. There was no marked difference in perception of games in general between men and women, nationality, or level of education. Only one participant declared a dislike for games before taking part in the workshop; afterward, the same individual reported they now held a neutral attitude toward the games: the research team took this as a marked improvement.

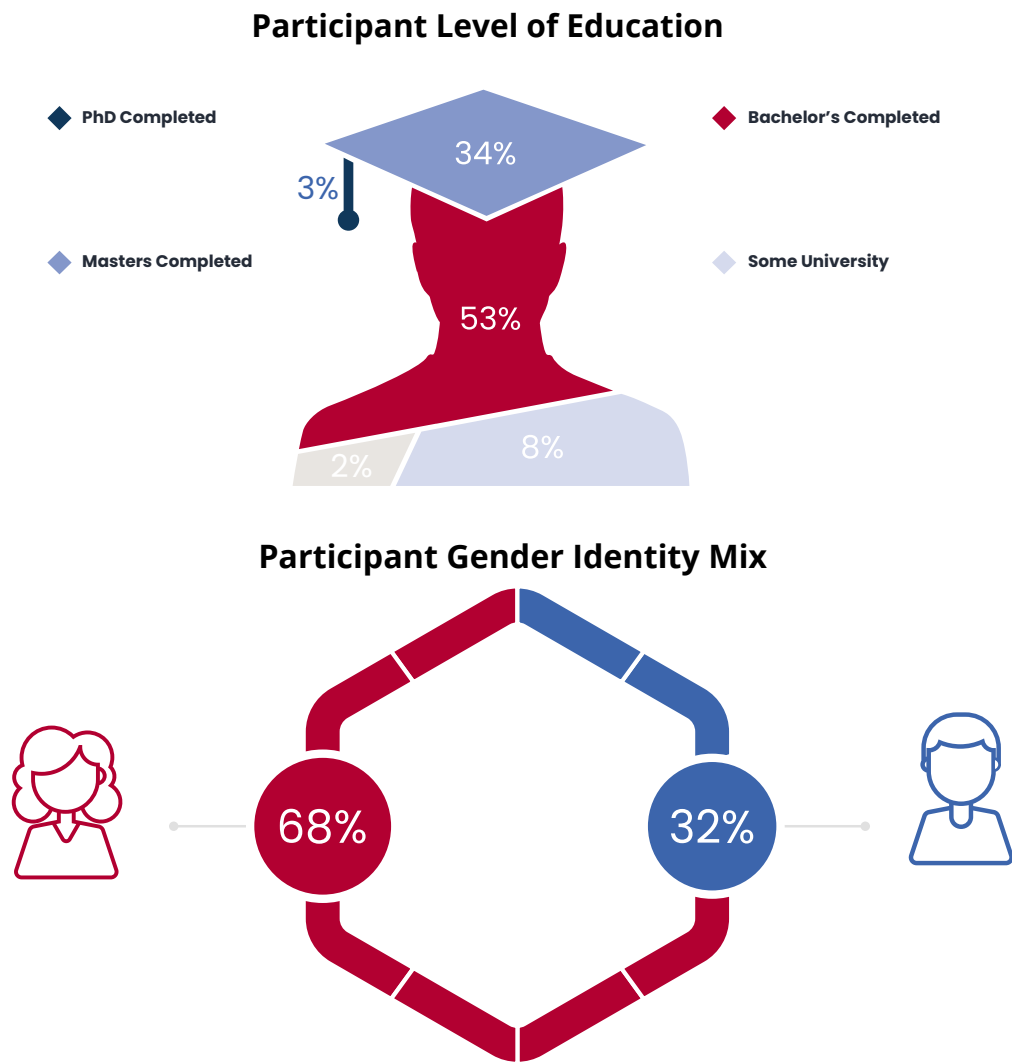


Figure 2: Participant Level of Education and gender Identity

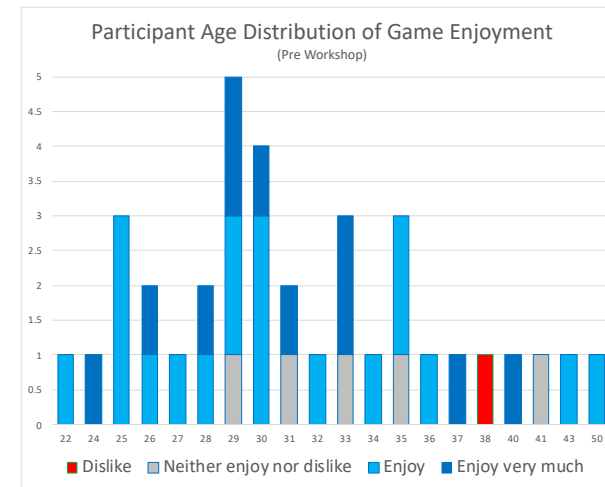


Figure 3: Participant Age Distribution

In previous studies, as well as in companion workshops carried out in North America, interest in games and gaming – digital games in particular – typically skewed towards men. This heavily gendered interest in games, as well as the assumption that board games are a western cultural phenomenon, had been noted as a potential challenge in the adoption of learning games in global contexts (for example, see Hunt, 2019). However, this assumption proved to be comfortably false in the contexts where this research was undertaken. After taking part in the workshops, players nearly universally reported enjoying the games. Women and men actively engaged in all sections of the workshop, contributing to in-game and post-game discussions, debates, and decision-making. While this was not a focus of the study, the serious games – in particular, tabletop games – seemed to contribute to a space where otherwise marginalized groups were able to participate on equal footing.

3.2 PERCEPTION OF GAMES-BASED LEARNING IN HUMANITARIAN WORK

“It was so hard. As soon as I thought I found a good strategy, I realized I had forgotten about an important part of life (like putting my kids in school or building relationships with neighbors). I found [the game] to be a very powerful activity that is truly only a microcosm of the average refugee experience (not even including other factors like being a minority refugee, not speaking the language, etc.).”

-PARTICIPANT, PRE-DEBRIEF, THE DAY MY LIFE FROZE

A core research goal of this study was to identify the perception of local humanitarian workers towards serious games as a potential learning tool in the humanitarian context.

The findings from the workshops in Nairobi and Amman demonstrated that while many local humanitarian workers do not have strong familiarity with learning games, they are very enthusiastic about the method and eager to learn with games. Through the workshops, participants maintained that enthusiasm and reported that the learning games we employed were better tools than PowerPoint slides or lectures, even when challenges were faced.

While these findings strongly suggest that participants are strong supporters of the serious gaming method, it should be stated that one shortcoming in our methodology is the self-selection of participants; it stands to reason that participants choosing to take part in a session on games-based learning will have some pre-existing interest in the topic. More research should be conducted to attempt to gauge the receptiveness of a larger and less biased section of the humanitarian community.

Acknowledging this caveat, the data collected shows strong receptiveness for learning games among local humanitarian workers.

3.2.1 PEOPLE ARE EAGER TO LEARN WITH GAMES

“Really excited for this!”
-PARTICIPANT, PRE-WORKSHOP SURVEY

“I believe board games work well for adult learning.”
-PARTICIPANT, PRE-WORKSHOP SURVEY

Based on surveys carried out before the workshop, a majority of participants held a positive attitude towards game-based learning and games in general. A majority already played either mobile games, board games, card games, or other social games such as backgammon or mancala regularly (at least once a month). Many also identified as regular players of sports and of video games.

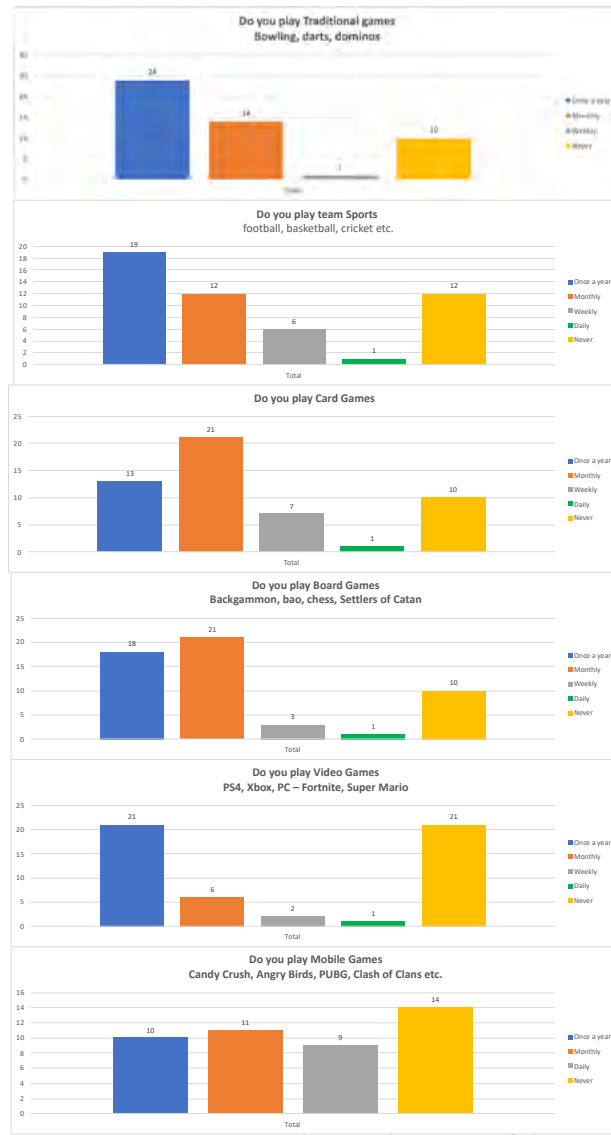


Figure 4: Participant Game Familiarity and Frequency of Play

In surveys taken in advance of the workshops, 46 out of 54 respondents reported enjoying games in general, with a gender distribution parallel to

Table 1: Game Enjoyment by Gender Identity

Game Enjoyment by Gender Identity			
	Female	Male	Grand Total
Enjoy very much	13	10	23
Enjoy	15	8	23
Neither enjoy nor dislike	6	1	7
Dislike	1		1
Grand Total	35	19	54

the breakdown of the group as a whole. Despite expressing an overall positive attitude toward games, the frequency with which participants engaged in game playing in daily life remained relatively low amongst our participants.

Table 2: Average Enjoyment Over time

	Tabletop Games			Digital Games				
	AFTERSHOCK	TDMLF	Digital	At-Risk	Forced to Fight	Mission Zhubia	Bury Me My Love	Liylai
Pre Debrief	2.11	2.55	1.92					
14 Day	1.93	2.7	1.5					
45 Day	2.78	1.5	1.5	1.5	0.85714	1.3125	0.25	0.66667
45 Day Clean	2.5	3	1.5	0	0.6	1.125	0	0.75
Enjoyed very much	3	Neither enjoyed nor disliked		0	Dislike Very Much			3
Enjoyed	1.5	Disliked			-1.5			

Throughout the face-to-face workshops, participants demonstrated in-person their reported enthusiasm. Participants were happy, excited, and positive throughout, eager to talk about their experiences. The enthusiasm tended to last. "I enjoyed the games very much. It was an interesting way to learn", stated one respondent after the workshops (Participant, 14-Day post-workshop survey). One participant reported six weeks after the workshop, "It was a beautiful experience" (Participant, 45-Day post-workshop survey).

Participants remained receptive even when challenges arose. As the workshops were designed around experimental research, in some exercises participants faced challenges such as heavy reading requirements, complex rules, technical difficulties, long load times for some digital games, etc. These challenges will be discussed in detail throughout the report. Nevertheless, participants remained engaged and enthusiastic.

3.2.2 EVEN PEOPLE WHO ARE NOT FAMILIAR WITH LEARNING GAMES ARE EXCITED TO TRY

"I hadn't played a computer game in quite some time. But I felt I was back into 'game mode', like when I was a kid."

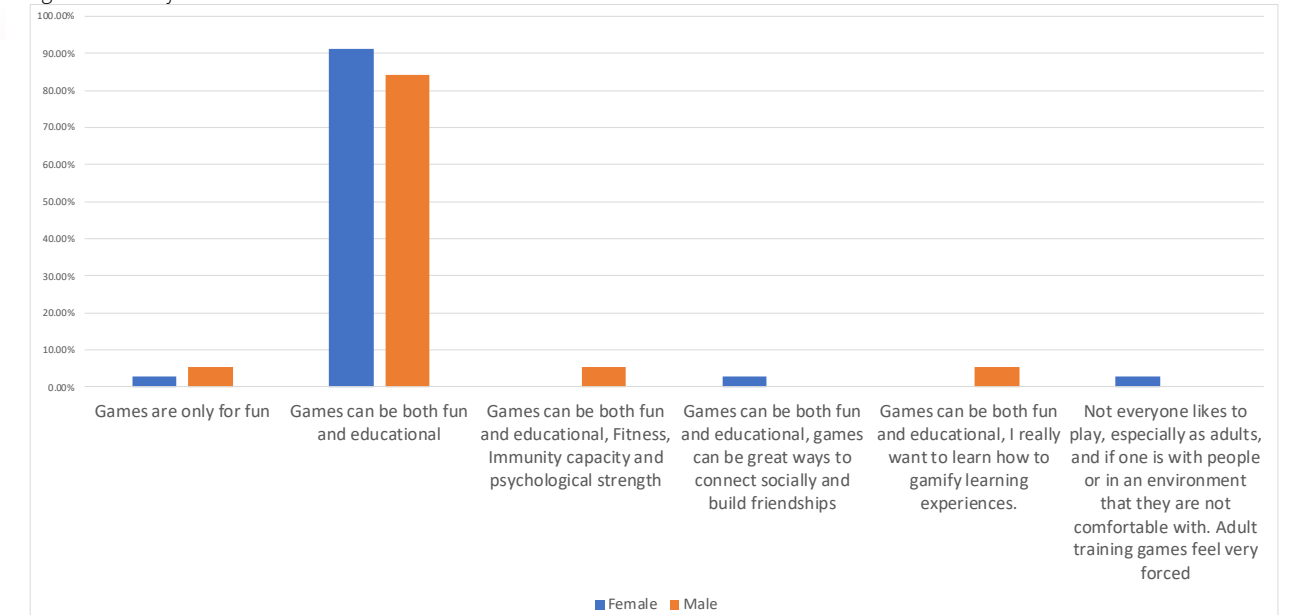
-PARTICIPANT, DIGITAL GAMES DEBRIEF
27 JAN 2020

Participants were not, in general, familiar with the term "serious games", with many participants (14/54) reporting that they had never heard of the term at all. Whether or not the terminology

came into the workshop with a predisposition that games were not a comfortable space, as an adult. Based on this individual's response, it seems their issue pertains to a discomfort with socializing with strangers. Learning about more "adult" subjects such as geography, politics, and workplace skills via educational games was a less familiar concept to the participants, but by no means uncommon.

After completing the workshop, 80% of participants reported willingness to use similar games in their personal learning in the future.

Figure 5 Role of Games



	Female	Male	Grand Total
Games are only for fun	2.86%	5.26%	3.70%
Games can be both fun and educational	91.43%	84.21%	88.89%
Games can be both fun and educational, Fitness, Immunity capacity and psychological strength	0.00%	5.26%	1.85%
Games can be both fun and educational, games can be great ways to connect socially and build friendships	2.86%	0.00%	1.85%
Games can be both fun and educational, I really want to learn how to gamify learning experiences.	0.00%	5.26%	1.85%
Not everyone likes to play, especially as adults, and if one is with people or in an environment that they are not comfortable with. Adult training games feel very forced	2.86%	0.00%	1.85%
Grand Total	100.00%	100.00%	100.00%

Table 3: Role of Games

was familiar, however, many participants were used to the idea of games being used to teach "hard skills" at the school level, such as math, language, and touch-typing. Only one respondent

A further 14% remained open to the idea, while only 6% did not see a role for serious games in their training regimen.

	What kind of training simulations have you heard of or participated in? [SimEx (or Simulation Exercise)]	What kind of training simulations have you heard of or participated in? [Computer simulations]	What kind of training simulations have you heard of or participated in? [HEAT training]	What kind of training simulations have you heard of or participated in? [Other]
Participated in	8	8	8	5
Heard of	14	13	14	6
Never heard of	28	28	28	17
Grand Total	50	49	50	28

Table 4: Serious Games Awareness



Figure 6: Would You Use a Similar Game in Your Personal Learning?

However, it should be noted that when asked if participants could foresee problems with using learning games in their own offices, results were mixed. While many were positive, some expressed concern about securing buy-in from office higher-ups, as well as time commitments. These findings will be discussed further along with other potential barriers to learning in Section 3.4: Potential Barriers to Learning.

3.2.3 PEOPLE FELT THAT GAMES WERE BETTER TOOLS THAN POWERPOINTS OR LECTURES

“It’s quite interesting to see how you have many different forms of learning, so like, say, with Zhubia, it was really like in a game setting. For the others it’s more when you have to make decisions, or are communicating with people... seeing the different scenarios and the decisions we make. It’s nice to see how you can do it in different forms.”

**-PARTICIPANT, DIGITAL GAMES DEBRIEF
22 JAN 2020**

After the workshops, when asked to compare learning games to other learning methods such

as PowerPoint slides or a lecture, participants strongly reported preference for learning games. 84.5% of participants felt that learning games were more effective than PowerPoint or lectures when learning the relevant subject matter.

- ◆ In 85.2% of the gameplay sessions, participants reported enjoying the exercise.
- ◆ In 87.5% of the gameplay sessions, participants found the game engaging.
- ◆ In 80.2% of the gameplay sessions, the game held participants’ interest from start to finish.

Those who found games “a little bit boring”, tended to find games relatively time consuming or too complicated in terms of rules. For more on this, see Section 6.4: The importance of the user interface (UI) and user experience (UX) below.

Participants reported that the learning games actualized lessons, helping to understand the complexity and dynamics of real-life situations. Games conveyed the stress, confusion, emotion, and frustration which exist in humanitarian work, which traditional lecture formats struggle to convey. For example, one participant explained that games brought to life complicated lessons in a way that other humanitarian training materials had not done.

“As a humanitarian worker, it helps you in any of the challenges you go through. You have to plan... on how to support those who are in these situations... Here also we see all these games—we need to put them [the lessons]

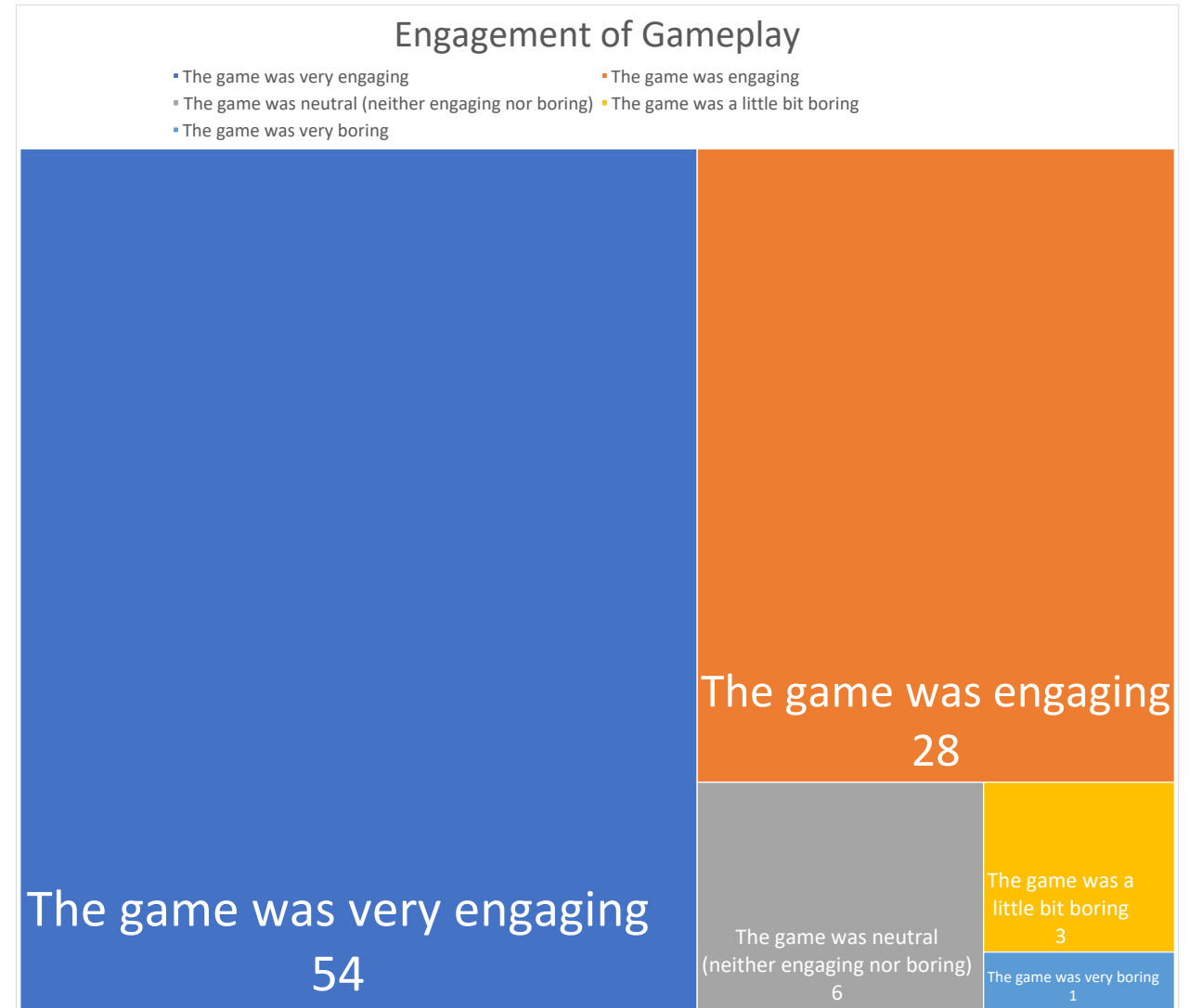


Figure 7: Engagement of Gameplay

into practice, so that in any environment you go, you are not scared. You know how to handle whatever comes your way.”

**PARTICIPANT, DIGITAL GAMES DEBRIEF,
22 JAN, 2020**

Another felt that the games played

“would be good to help self-assured humanitarians to recognize that they need to understand people and contexts before acting too quickly,” and concluded, “I will come back and play this one more extensively”

PRE-DEBRIEF WORKSHOP SURVEY

It should be noted that self-reported engagement in a game does not necessarily equate with better achievement of learning goals. A direct comparison of learning outcomes between traditional lectures and learning games was

beyond the scope of this study; however, as outlined previously in this study (see Section 1.3) games are best used as a support tool for other types of learning, rather than a replacement.

While engagement and learning do not necessarily correlate, the value of learner engagement and motivation to learn should be appreciated when designing learning games. This is especially relevant in the context of digital learning tools, which learners are expected to engage with on their own time. See Section 1.1.2 for more on this subject.

3.3 EFFECTIVENESS OF GAMES-BASED LEARNING IN HUMANITARIAN WORK

3.3.1 PEOPLE LEARN FROM GAMES IN THE HUMANITARIAN CONTEXT

"I think it's very relatable... I know people like this! I can put a name to this guy! [laughter] That makes the learning experience deeper, that you can relate to any character."

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 27 JAN 2020

"You relate to the beneficiary, instead of being on this other side of always doing things for them."

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 22 JAN 2020

"So in this, I think as humanitarian workers, what [the games] brought is something good, because we learn by experience."

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 22 JAN 2020

Games as a tool for engagement are particularly of value in settings where student empowerment and critical engagement is fundamental. As humanitarian pedagogy aspires to make training more accessible and locally-driven by engaging local actors, games may be a useful tool in decolonizing training. Games often employ a participatory style learning and the learner's active role in the construction of knowledge--in contrast to traditional lecture-based learning where knowledge is passively consumed--transfers authority from the instructor to the individual. As learners become newly engaged in the learning process, knowledge transfer shifts from a hierarchical process to a horizontal process, with a strong emphasis on peer-to-peer relationships, communication, cooperation and emotion. For the humanitarian sector to become more inclusive, individuals must play a role in creating the framework of humanitarian education. This has the added value of making the learning process much more impactful and meaningful and thereby more effective.

In group debriefings following the game sessions, local humanitarian workers who participated

in the workshop were able to describe their learning processes after engaging with various learning games. Whether describing an increase in empathy and appreciation of the situations of beneficiaries, or better understanding of humanitarian coordination and distribution, participants were succinct in describing learning moments in the games and how those moments related to humanitarian work in general. As one participant explained,

"I liked the way [the game] reflected the real situations on the ground... and I liked how Nora [the character] took the initiative"

PARTICIPANT, DIGITAL GAMES DEBRIEF, 27 JAN 2020.

Another described the challenge of procuring resources that would meet rapidly evolving needs:

"When you pick your resources [humanitarian relief supplies] at the end of each turn, it's based on what's important at that time. But it's never actually relevant once you get to your turn again. Which I thought was pretty cool and accurate"

PARTICIPANT, AFTERSHOCK DEBRIEF 28 JAN 2020

Participants were also succinct in describing why some specific games did not teach them as much. One participant, for example, said of one game that,

"There weren't actually that many choices that you made, and whatever choices you made, you kind of ended up in the same storyline. I thought it would have been more effective if it didn't have as much text and we made a lot more decisions, and each of the decisions would lead to very different outcomes"

(PARTICIPANT, DIGITAL GAMES DEBRIEF, 27 JAN 2020).

Another reflected that a game would be a better learning tool if

"there was some kind of showing of the results, or examples of what are the right answers, the right options, at the end of the game so someone can learn from it"

PARTICIPANT, DIGITAL GAMES DEBRIEF, 27 JAN 2020).

Perceived Learning

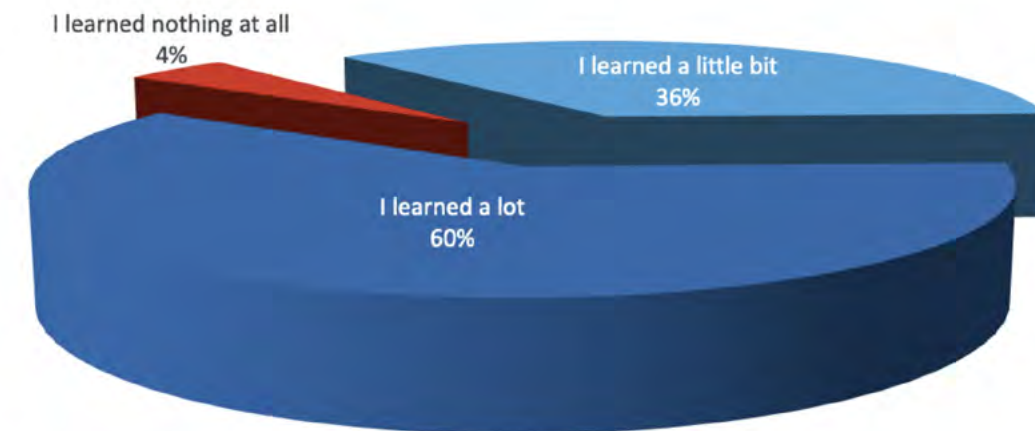


Figure 8: Perceived Learning

Specific challenges that participants faced in learning will be explored in the following sections on barriers to learning and on good practice in learning game design.

Survey responses similarly featured participants self-reporting that they were learning from the games, with 96% of responses demonstrating at least some learning and 60% reporting having learned very much.

Supporting this data, they were able to correctly identify many of the (often complex) learning outcomes of the games they engaged with. Participants were presented with a list of options and asked to describe their learning; their responses were compared with the expected outcomes and assigned a "skill score". In general

participants were more successful in identifying skills on the tabletop games than digital games, but this may be attributed to the longer time required for tabletop games and the nature of shorter games being more focused on a more narrow set of specific skills.

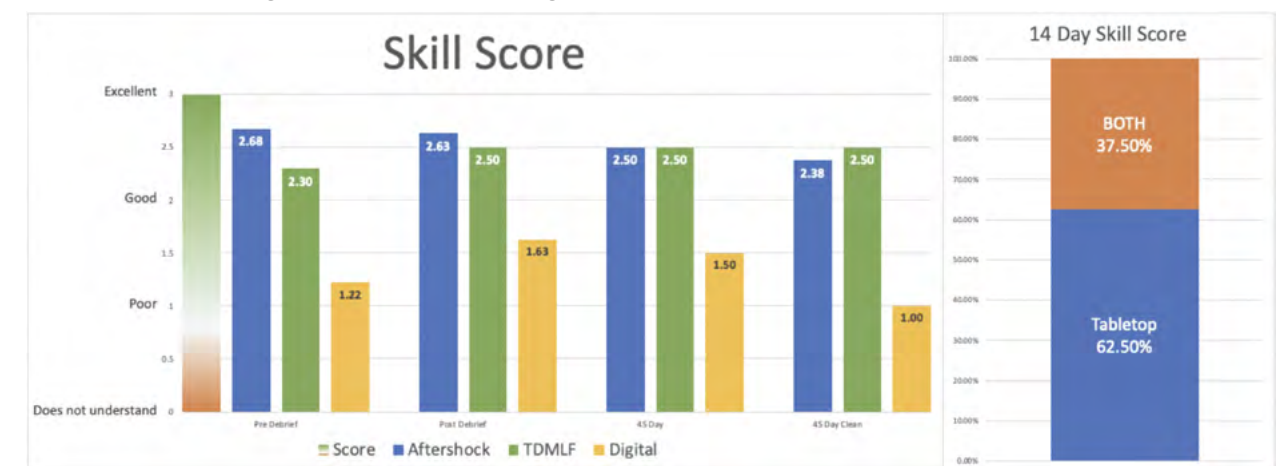


Figure 9: Skill Score Over Time

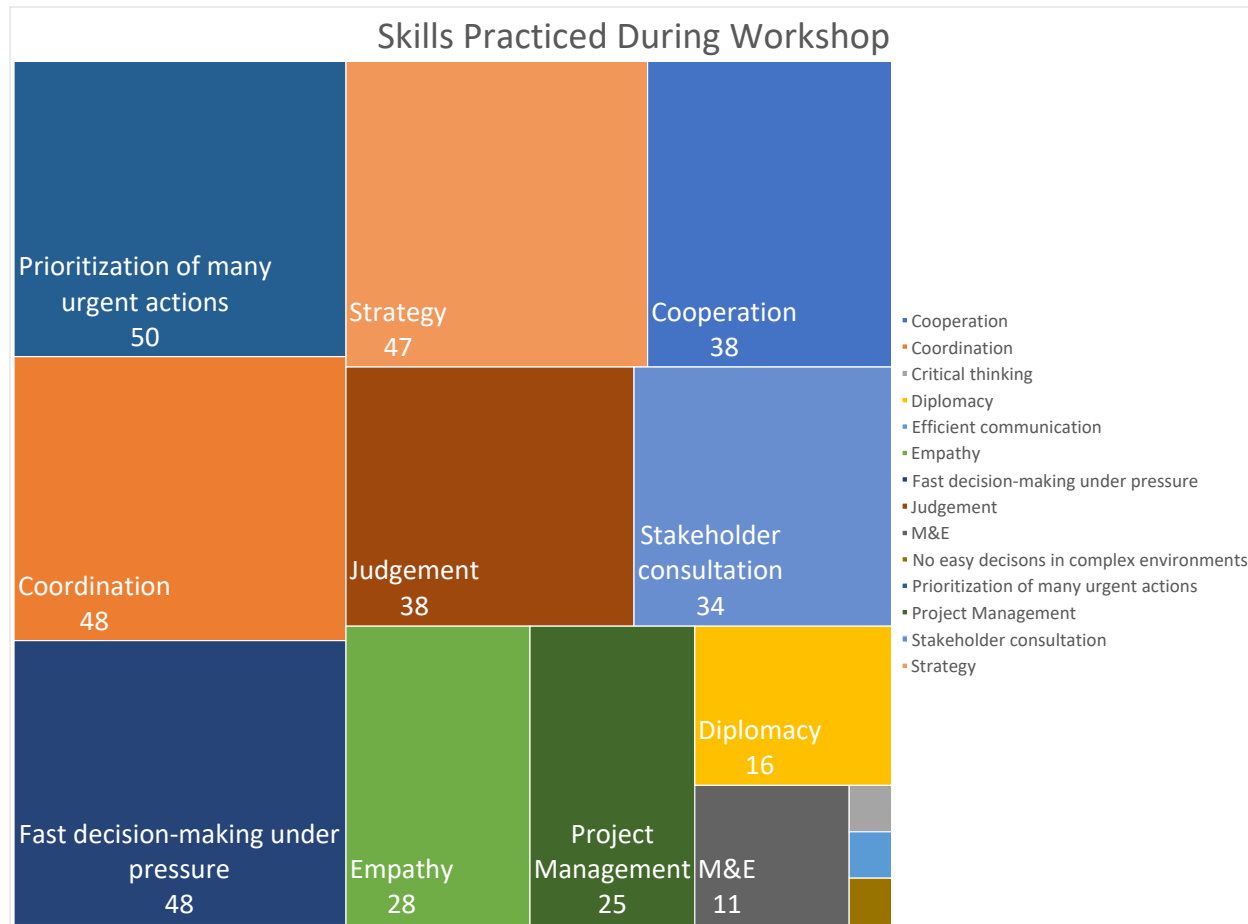


Figure 10: Skills Practiced During Workshop

3.3.2 IMPRESSIONS OF GAMES OVER TIME

"I loved the final simulation activity."
-PARTICIPANT, 45-DAY POST-WORKSHOP SURVEY

"I enjoyed the exercise as this is the first time I had this experience."
-PARTICIPANT, 45-DAY POST-WORKSHOP SURVEY

"I don't have any strong memories at this point."
-PARTICIPANT, 45-DAY POST-WORKSHOP SURVEY

Based on the surveys taken immediately after the workshops, fourteen days after the workshops, and forty-five days later, tabletop games were consistently liked more than digital ones. This was consistent with participants' visible reactions during the gaming sessions and debriefings during the workshops. Over time, participants reported an increasing drop in recalled enjoyment of the digital games. Tabletop games, conversely, generally remained an enjoyable experience in participants' memory over time (See Table 2).

While participants' overall experiences of the workshops remained positive over the complete course of the research, when asked about individual games 45 days after the exercise, participants reported a very neutral impression of the digital games among the participants.

While the tabletop games chosen were designed to be educational tools with specific goals, the digital games did not all have the same specific pedagogical focus. This may explain some of the differential between the media. More striking, however, is the significant drop in the perceived enjoyment of the games over time. This indicates a less positive memory of the digital games as time passes, which may have an effect on a participant's motivation to replay a digital game; this is an avenue for future inquiry. One of the advantages of a mobile game is the ability of students to replay the games as refreshers, thus the motivation to do so is of paramount importance.

3.3.3 LESSONS LEARNED OVER TIME

"I remember the chaos that quickly led to cooperation in Aftershock; the confusion and embarrassment of not having done my research prior to arrival in Mission Zhubia; and the inevitable happy endings of At-Risk"
-PARTICIPANT, 45-DAY POST-WORKSHOP SURVEY

"The Day My Life Froze gave an emotional experience of the panic, worry, and activity that refugees face to survive."
-PARTICIPANT, 45-DAY POST-WORKSHOP SURVEY

Over the course of the research schedule, participants were asked to repeatedly gauge the effectiveness of their organizations' interventions within the communities they aimed to support.

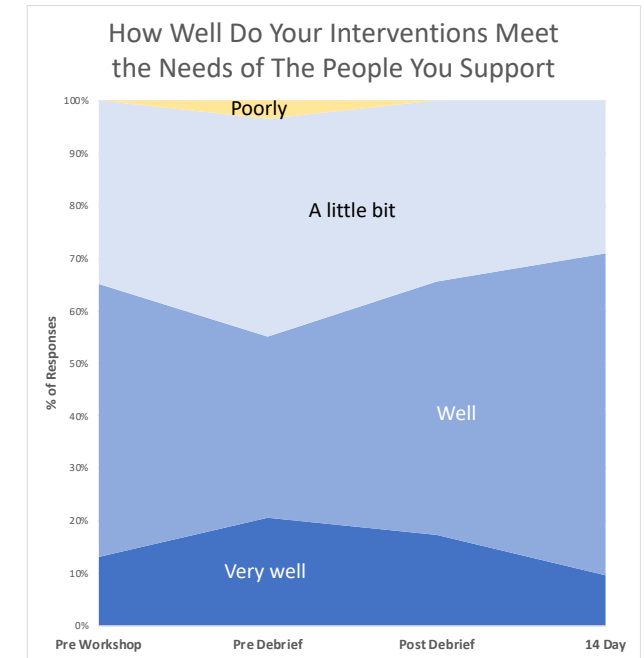


Figure 11: Effectiveness of Interventions Over time

Participants' confidence in their organizations' interventions was quite high before the workshop, with over 60% of respondents feeling they met their clients' needs well or very well. However, immediately following the workshop, before the debrief, participants' confidence dropped significantly.

This is an interesting outcome that may be explained by a more critical analysis of their own organizations' ability to deliver needed support.

Following the debrief, measured confidence returned, with fewer participants claiming their organizations served people very well. This trend continued over two weeks and participants continued to think their organizations were serving needs reasonably well, but the extremes of the spectrum attenuated. From this data, we can infer that after the workshop participants may be looking at their work with a more critical, discerning eye, and view their work with measured confidence.

Participants were also asked to report their self-perceived understanding of their beneficiaries before, during, and after their participation in the workshop. In pre-workshop surveys, participants answered with strong confidence that they had an excellent understanding of their clients. After the workshops this confidence waned and became far more measured. Given the small sample size included in this study, this trend merits further study, but it would appear the participants grew more critically introspective about their understanding of the communities they work to support following the workshop.

In both of these cases, the research team chose to interpret this tendency toward more humble self-assessments of effectiveness and understanding

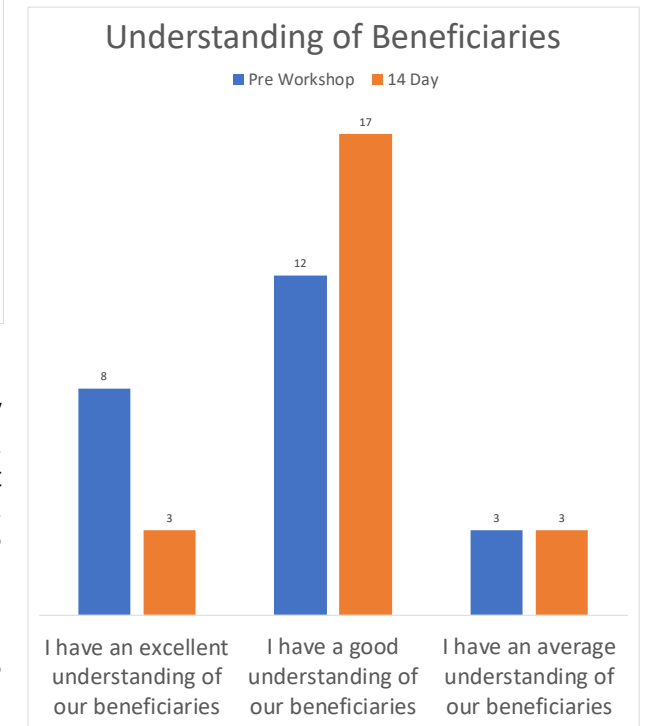


Figure 12: Understanding of Beneficiaries

as a major success of the workshops. These findings suggest that learning games are useful for demonstrating the challenges and complexities of humanitarian work, highlighting common errors we make in our work, and illustrating how people who receive our services may perceive our work as misguided. While more research could be done to explore how learning games contribute to more measured self-assessments of players' knowledge and work, these initial findings are encouraging.

45 days after the workshops, participants remained able to recall specific lessons from many of the games played, both those they enjoyed and those they did not. Participants were able to recall, for example, that specific games:

“show[ed] the issue with ‘white saviorism’ and how often NGO workers enter into a field, expect to be able to make big changes, and then end up causing more harm/distrust”, that “the physical stress of the game and how confusing it was to navigate all the moving parts on in the allotted time. I found it to be a very insightful and important game”, or that games highlighted “the many moving pieces to consider, complex elements of each turn and movement, [and] importance of communication”

45-DAY POST-WORKSHOP SURVEY-C.

Across the spectrum of participants, the perception was one of having learned from the workshop, and the evidence above suggests they also developed a keener view of their own activities. This indicates not only a change in knowledge, but a possible change in thinking.

To aggregate participants' self-reported exercising of particular skills during the learning game sessions, a scoring mechanism was developed. A rubric was employed which assigned skills reported to particular learning games played, and each answer was scored on a scale from 0 to 3. Both tabletop game experiences were significantly better able to transmit the desired learning outcomes, and skills to be trained. Participants were very clearly able to recognize what skills they used. The digital games included did not result in as clearly identified learning outcomes by participants. (Figure 9) In both cases, the debriefing sessions resulted in a clear boost in participants abilities to identify the skills exercised in the games.

Participants were not as successful in identifying the skills practiced in mobile games as compared to those who practiced in tabletop games. This suggests that tabletop games are more effective in achieving learning outcomes than mobile games. It must be noted, however, that the tabletop games used in the workshop were designed from the outset as structured educational tools, with specific learning outcomes in mind. The facilitator had considerably more experience with both tabletop exercises, and in one case was the designer. It is unknown to what extent the mobile games' designers were applying specific pedagogical methods.

When examining participants' abilities to identify skills exercised over time, recollection of skills exercised in digital games similarly degraded at a higher rate than those of tabletop games.

3.3.4 GAMES PROMOTE BEHAVIOURAL CHANGE IN THE HUMANITARIAN CONTEXT

“You have the white man who comes across [the screen] and says ‘here’s your job!’ and he tells you confidently ‘oh, everything’s going to be fine, just go do this thing.’ And as you go through it, you find out that he didn’t really know what he was talking about. It’s kind of neat, they lead you in one direction and then take you in another.”

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 27 JAN 2020

“It has made me think of ways I have never thought of the communities we serve.”

-PARTICIPANT, 14-DAYS POST-WORKSHOP SURVEY

“It reminded [me] never to think that I know everything people need no matter how familiar I am with a context.”

-PARTICIPANT, 14-DAYS POST-WORKSHOP SURVEY

“It encouraged me to always pause before jumping into a new task of prioritization.”

-PARTICIPANT, 45-DAYS POST-WORKSHOP SURVEY

Beyond teaching skills, facts, or mental maps of complex problems, games have been shown to be effective tools for the translation of lessons into changes in behaviour or attitude. This research relied on self-reported changes in behaviour, rather than testing for changed behaviour directly. However, in most cases, participants reported feeling that the games run in the workshops had

changed how they work and how they perceive the people they seek to support through their work. A better understanding of the situations that beneficiaries face was a common theme.

“Every choice had a consequence... but there was no solution that was better than another,” said one respondent.

“It makes you think about the options that are available [to people in conflict situations]”, said another

DIGITAL DEBRIEFING, 21 JAN 2020

In post-workshop surveys, participants reported bringing increased “empathy” to their life and work. After the workshops, participants found themselves more commonly “looking at the bigger picture while making decisions”, striving for “understanding all the parties’ needs and demands” in their work, and better “critical thinking in crisis and coordination during pressure and hard times”. Games helped learners

“understand how to prioritize the real needs of the beneficiaries rather than assumed needs”

PARTICIPANTS, 14-DAYS POST-WORKSHOP SURVEY

Will Today's Lessons Affect my Work? Post Debrief

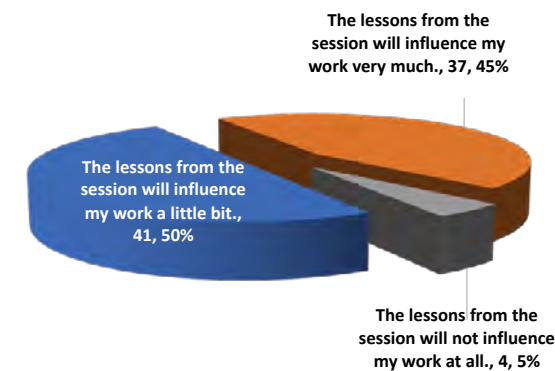


Figure 13: Will the Lesson Affect Work (Post debrief)

95.2% of participants predicted during the workshop that the lessons learned would influence their work; in particular, 46.4% reported their work would be dramatically influenced. After 14 days, self-reflection on how the workshops influenced participants' work fell slightly from the prediction: 91.1% of participants felt that their work had been influenced, with 38.2% reporting that their work had been strongly influenced.

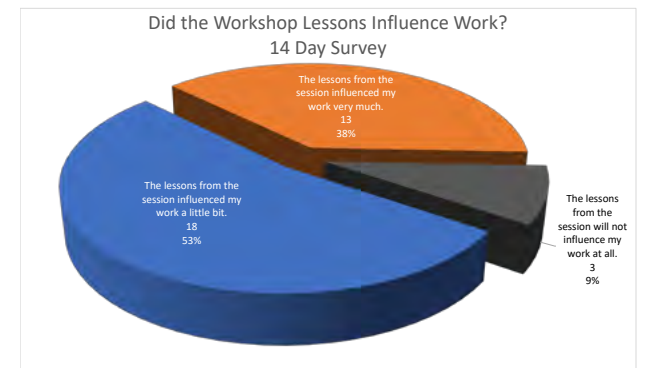


Figure 14: Did the Workshop Influence Work (14 Day)

These figures remained relatively stable through the 45-day post-workshop survey process.

78.6% of participants similarly predicted during the workshop that the sessions would change their relationship with the beneficiaries their organizations are attempting to serve, with 40.5% reporting that their relationship will change in a very positive way. This also dropped when participants reflected on actual changes in attitude after 14 days: 71.9% felt that their relationship had in fact changed, with 25% claiming that their relationship changed in a very positive way.

Do you feel that the lessons you learned at the workshop have influenced your work? 45 Day

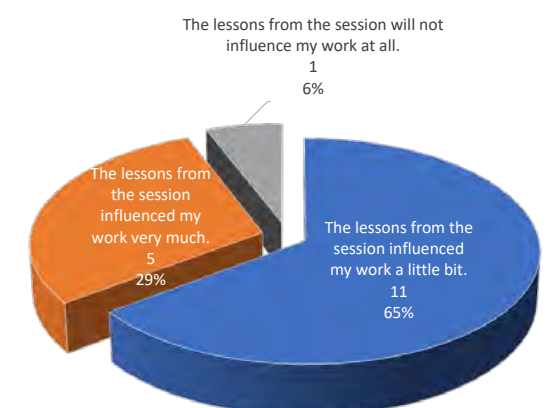


Figure 15: Did the Lessons Influence Work (45 Day)

45 days after the workshops, participants reported maintaining “a new perspective on humanitarian response work”, that the games

“encouraged me to always pause before jumping into a new task of prioritisation”, and going forward with “a better idea about emergency response during conflicts”

PARTICIPANTS, 45-DAY POST-WORKSHOP SURVEY

Almost all participants were able to recall specific lessons from learning games, and reported learning from the games and the workshop. In particular, 45 days after the workshop, participants reported tabletop games in particular as being a powerful learning experience.

Do you feel that the lessons you learned at the workshop have changed your attitude towards the communities where you or your organization work?

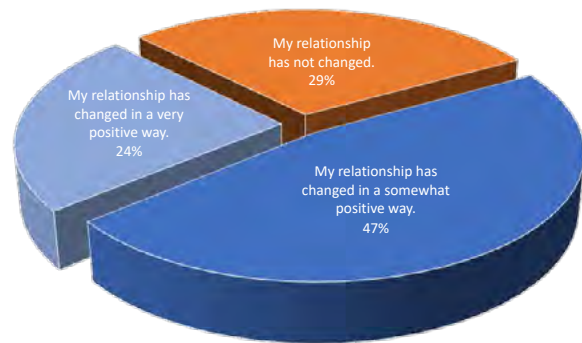


Figure 16: Did the Lessons Learned Change Attitude Toward Served Communities

Participants surveyed 45 days after the workshop emphasized the importance of communicating with beneficiaries, and understanding the culture of beneficiaries. All but one respondent of the 45-day survey answered these were among the top three priority tasks for humanitarian workers or organizations during an emergency. This is a noticeable increase of 7% from pre-workshop responses. 45 days post-workshop, 71% of respondents indicated a positive change in relationship and attitude towards the communities they or their organization serve. Throughout the course of research, participants were able to critically engage with learning games, especially in reference to affected communities. As one participant explained,

“Yeah, I was thinking, we have all the actors... but not the people. They are just receivers.” Another expanded, “They’re not real, almost. This game doesn’t focus very much on the people. It focuses on the process”

PARTICIPANTS, TABLETOP DEBRIEF, 21 JAN 2020.

Another participant explained that

“My preferred game was Mission [Zhubia] because the solutions weren’t straight forward and made me think about how I would address those kinds of situations. However it also required more time and a higher level of concentration, and some of the readings/information could probably have been simplified”

PARTICIPANT, 14-DAY POST-WORKSHOP SURVEY.

3.3.5 “GAME LITERACY” IS NOT AS IMPORTANT TO GAMES-BASED LEARNING AS EXPECTED

In designing the workshops for this study, the research team was particularly concerned with how important existing “game literacy” is to the effectiveness of learning games as teaching tools. To function appropriately in humanitarian contexts, learning games have to be relevant to people of a wide variety of genders, age categories, and nationalities. In particular, people who have little previous experience with games must be equally able to extract lessons from game-based exercises as those who play games regularly. To test this, a range of games of varying complexity, genre, and difficulty were included.

In conducting the workshops with participants, it quickly became clear that, if well designed and/or facilitated, learning games were indeed accessible to people with very little experience with digital or tabletop games. If participants were gradually introduced to rules, in most cases they were able to engage effectively even very complex exercises and extract learning goals. This depended heavily on effective facilitation, or a well-designed digital game which helped gradually immerse participants in the process of the game.

This was particularly evident when comparing tabletop and digital games. Digital games “wrap up” some of the complexity by allowing the software to manage rules, regulate player actions, and process outcomes; in comparison, tabletop games often demand considerably more from players. However, through the course of the workshop, participants reported both enjoying and learning more from tabletop games than from digital games. This was heavily impacted by the presence of a skilled facilitator, however. As one participant admitted, “If there was no facilitator, people might start randomly playing,” to which another responded: “Especially because it’s a cooperative game! You need the judge, because it’s in all of our interests to bend the rules” (Aftershock debrief, 28 Jan 2020). Participants often cited the complexity of the game as a challenge, even when reporting that they enjoyed and learned from the game.

Familiarity with the “language of games” certainly impacted participants’ ability to learn from games

Participants with No Serious Games Experience Enjoyment

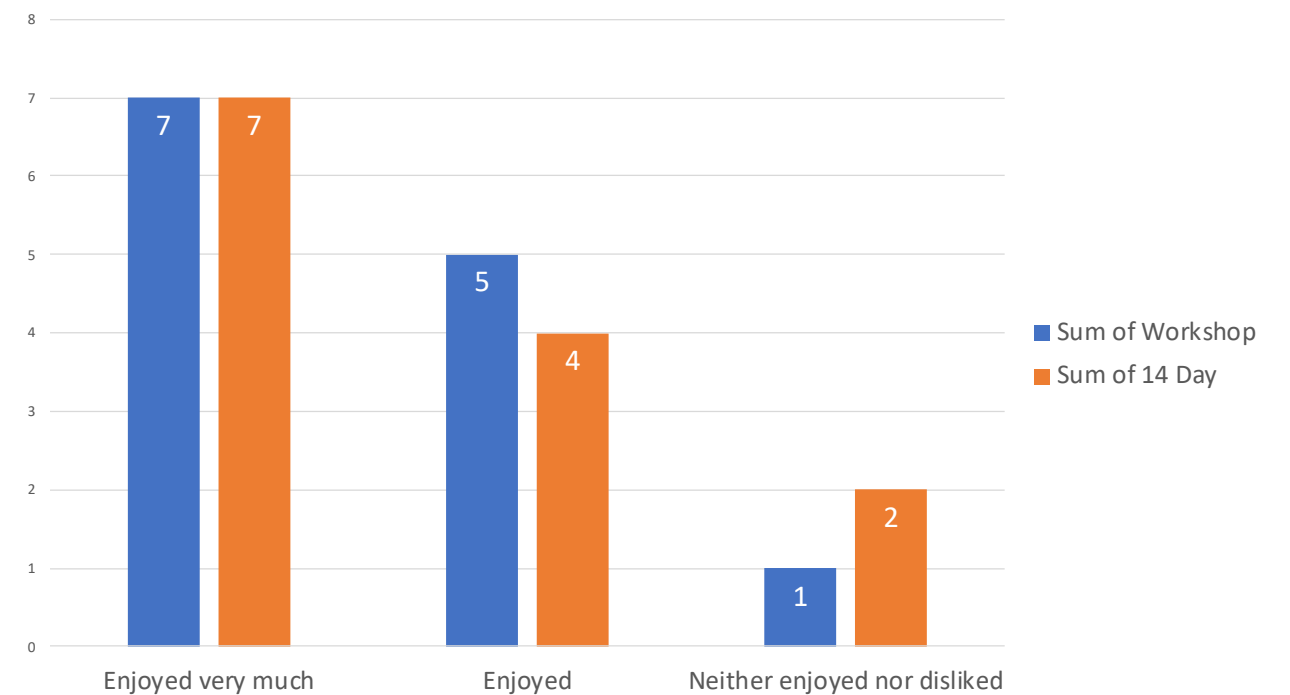


Figure 17: Enjoyment of Participants with No Prior Serious Games Experience

Participants with No Serious Games Experience Self Assessed Learning

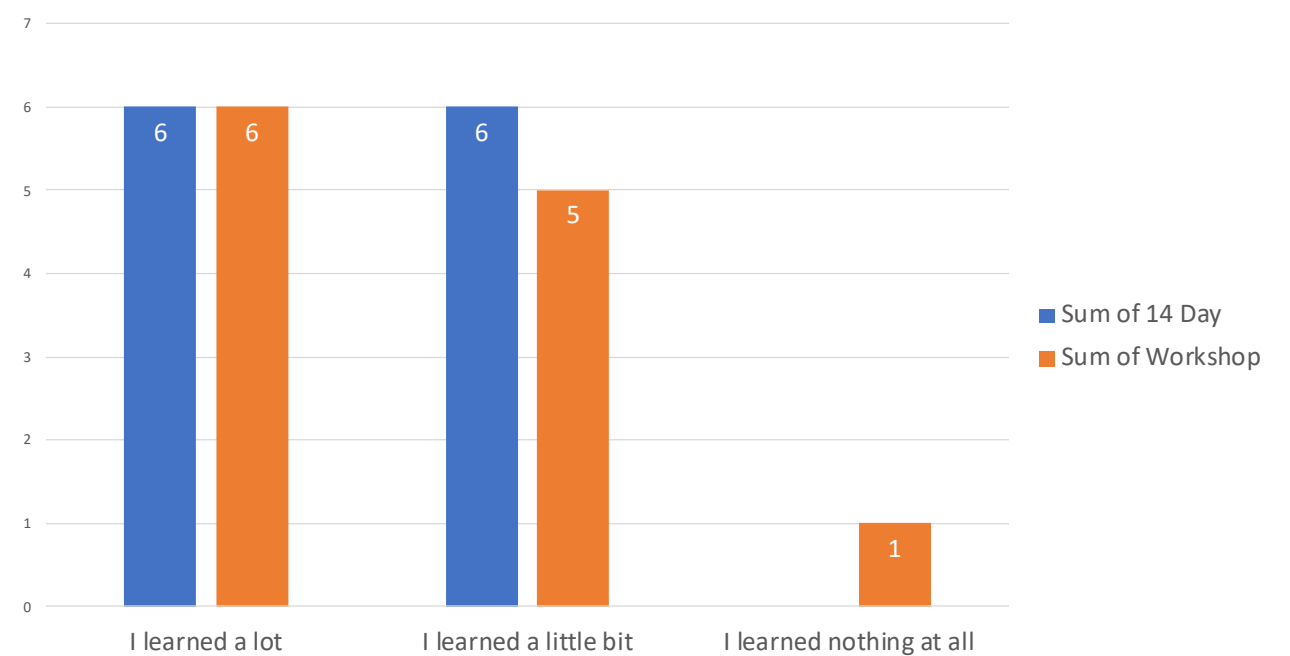


Figure 18: Self Assessed Learning by Participants with No Prior Serious Games Experience

which were not designed with newcomers in mind. In particular, learning games built in the “action” genre demanded skills and reflexes which many participants had not developed. This led to participants struggling to progress far enough into the game to “unlock” learning outcomes.

It is important to note that designing with newcomers in mind does not necessarily equate to producing simplistic games. In fact, participants were often quick to identify simplistic games as

uninteresting or boring. Instead, designers should ensure that challenges presented to the player do not presuppose existing skillsets. This will be discussed in more detail in Section 6: Good Practice in Humanitarian Game Design.

Analyzing the self-assessed answers of participants who had no serious games experience before the workshops, we find that at worst, a few participants left with a neutral attitude toward games-based learning. Most enjoyed the experience, and left feeling they learned from the endeavour.

Those who enjoyed the workshop, saw a miniscule drop in enjoyment when they were asked to recall the experience, yet the perception of learning increased by the same amount. This highlights a not-to-be-ignored reality: Learning outcomes do not depend on enjoyment. However, it is true that enjoyment is one, of many, factors in self-driven, independent learning exercises.

3.3.6 DEBRIEFING, CONTEXTUALIZATION, AND SKILLED FACILITATION ARE ESSENTIAL TO THE LEARNING PROCESS

“Yeah, I would have been SO lost if we didn't have an expert facilitator.... It's complex. There's a lot of moving pieces, and especially with the... the timing thing, you have to [have a facilitator]. It would just be too stressful unless everybody had already played before.”

-PARTICIPANT, AFTERSHOCK DEBRIEF, 28 JAN 2020

The importance of a comprehensive facilitated post-game debriefing to the learning process is already well accepted by the serious gaming community. However, little research has been conducted to validate the accuracy of this practice.

During the workshop sessions, the importance of the debriefing was clear. Participants were observed talking through their emotions, making order of their experiences, and comparing and contrasting their reactions. The debriefing process resulted in a synthesized list of learning outcomes. Every single participant across the study reported that the debriefing was helpful in ordering the lessons imparted by the learning games played, with the vast majority reporting that the debrief was very important to learning.

How Important was the Debriefing to Your Learning from the Exercise

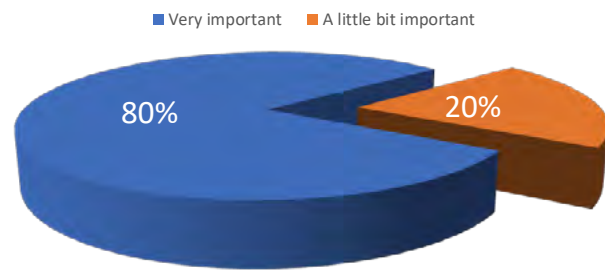


Figure 19: How Important Was the Debriefing?

A structured debriefing, facilitated by an experienced trainer, is the most common way to debrief players. However, further study should be carried out to examine how digital processes can reproduce the in-person debrief.

The importance of the debriefing relates strongly to the value of broader contextualization of learning games within a curriculum. As one participant explained of one game,

“There were a few links, like to the Vancouver Proclamation, and to ICRC. I think it would be good if there were more. And there were sometimes references to things without explaining. Like they use ‘EHL’ without explaining what that is. They had a page of a handbook but they didn't say what it was. On those kind of things, I wanted to click a link. Similarly in that kind of game there is more or less information leading you to learn more about it. It would have been nice to have some statistics and things to ground it in the real world”

**PARTICIPANT, DIGITAL GAME DEBRIEF
22 JAN 2020.**

The effectiveness of learning games is heavily predicated on the quality of their facilitation and/or contextualization in the broader learning environment. Learning games, presented alone, do not necessarily transmit the desired learning goals to players. This is reflected by findings described elsewhere in this report, such as the importance of debriefs (see Section 3.3.6) or the importance of “getting to the point” (see Section 6.2).

The skilled facilitator, on hand to support the participants with both procedural and content-related questions, proved to be extremely useful throughout the workshops. This could be as simple as helping players with technical problems and simple recommendations for best

interacting digital games; for example, several games required some “setting tweaks” for best access. For tabletop games, the facilitator is responsible for structuring the learning environment (laying out the classroom; setting up the game components), presenting the game scenario, and coaching the players through the rules (both presenting at least some rules before the game and reminding them of rules during play).

Beyond procedural support, a skilled facilitator helps to filter and present learning content in both digital and tabletop games. This includes answering questions during the game (e.g. Why is a particular action modeled in a particular way? What real-life challenges do game mechanics represent? What elements are simplified or omitted entirely), as well as explicitly highlighting learning outcomes during the debrief, as discussed above.

Without a facilitator on hand to support learners, or an alternative well-prepared and tested support structure, learners will struggle to extract learning outcomes. In our research, this was either due to inability to access the material or for lack of support in translating experiences and emotions into concrete learning outcomes.

In the context of digital learning, participants should ideally be able to learn independently without the support of a facilitator. Much like online courses require a different, more preparatory approach than in-person classes, online learning games intended to be consumed without the use of a facilitator are likely possible to situate and support digitally with in-game tools and other digital supporting media. However, the extent to which a digitized replacement for an in-person facilitator will succeed in training objectives should be further studied.

Facilitator training for some learning games can take place very quickly; experienced emergency response trainers can be taught to facilitate sessions of the tabletop learning game Aftershock in as little as a day. Much like a fully online experience, the extent to which facilitator training can be digitized was not examined in this research, and should be considered for further experimentation.

3.4 POTENTIAL BARRIERS TO LEARNING

3.4.1 TECHNOLOGICAL CHALLENGES

The most common challenges that were faced during research related to adequate technological access. In several workshops, every single participant had at least one technical challenge over the course of the digital gaming session. Many of these issues were anticipated, and as such the research team was able to address these issues in advance or to minimize the impact on workshop days. However, it was important to note that most of the debilitating challenges faced were those which we failed to anticipate.

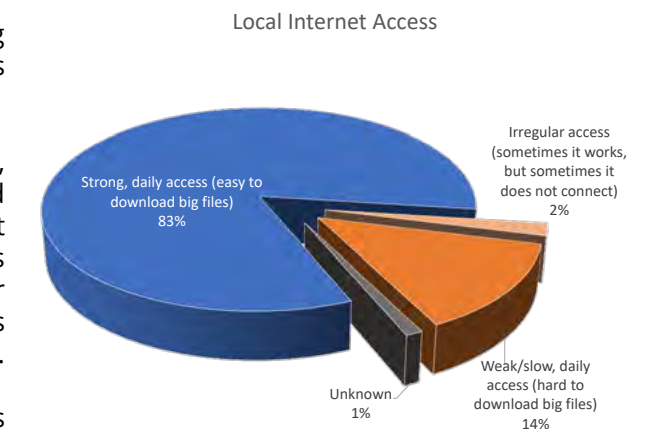


Figure 20: Local Internet Accessibility

In the best circumstances, roughly 15% of survey respondents revealed difficulties with internet access. This, naturally, leads to difficulty with any digital learning game distribution. Further, as this data collected refers to respondents' regular home and office access, it has to be assumed these problems will be exacerbated in the field, or during a crisis. This is a significant factor in determining distribution and type of digital game that can be implemented. (i.e. need for constant connectivity, download size, etc.)

These issues, of course, were not present when running the tabletop learning games in the classroom.

Overall operating system incompatibility was expected, and proved to be a serious challenge. Many active mobile devices around the world are incompatible with the up-to-date versions of Android or iOS. This is often due to the age

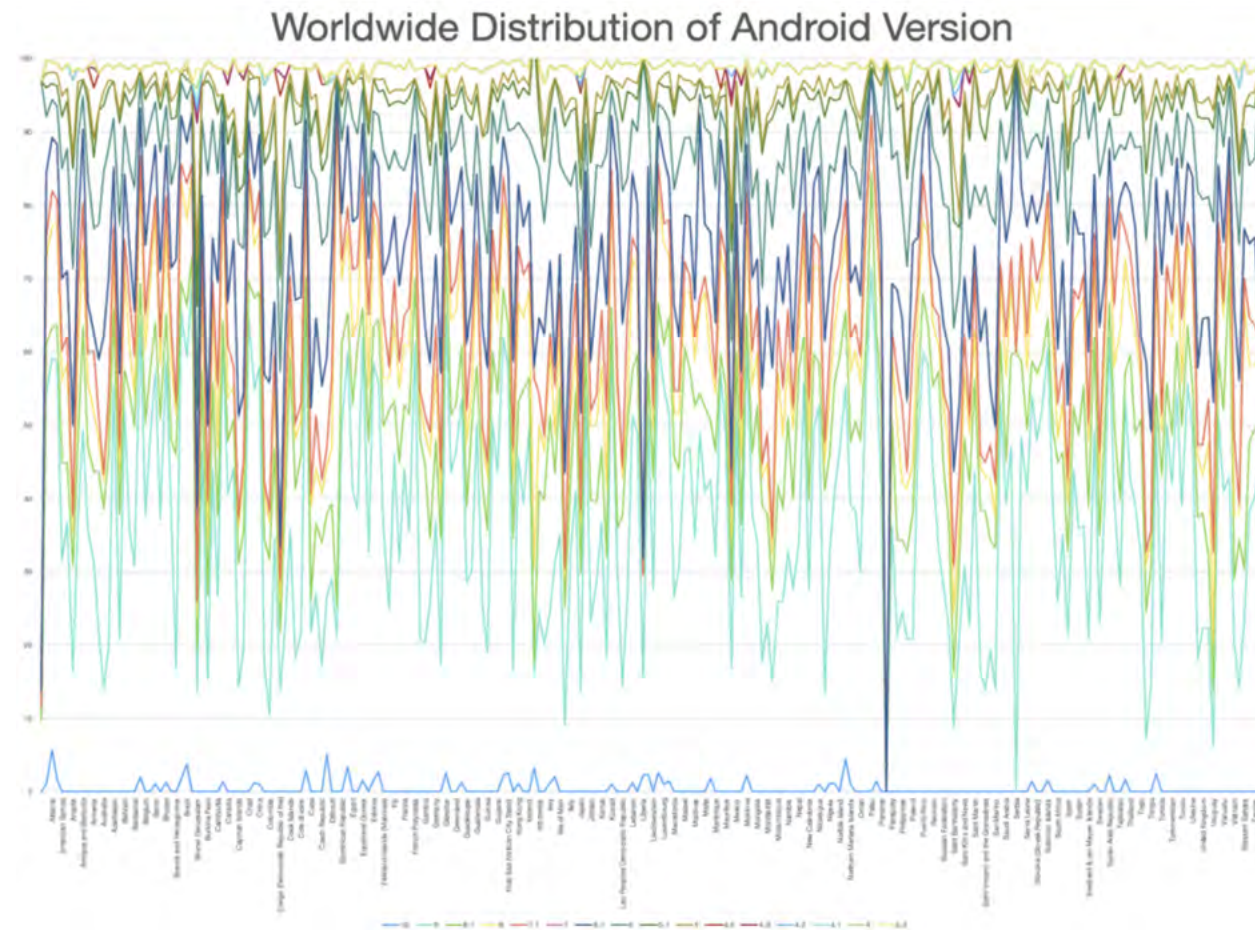
and technical specifications of devices, such as internal storage, screen size, available RAM and clockspeed. This is a global challenge, but is especially prevalent in parts of the world where mobile users might be looking for inexpensive devices and are replacing them with less frequency.

This is a fundamental design and distribution factor for any mobile-based learning program. OS creep, and OS obsolescence can lead to many user frustrations if games become incompatible with a device after an update, or a new device is not reverse compatible with a developed learning-game.

distributing these devices to the learners, and pre-loading the mobile learning tools in question, discussed in more detail, below.

These challenges were directly observed by the research team during workshops. From a technical standpoint, only the simplest games (such as Forced to Fight) were accessible to all participants. Some games, such as At-Risk, with simple 3D graphics and longer loading times, were inaccessible to more than 50% of participants. In addition to older cellphone models, participants struggled with atypical devices (for examples, Microsoft's now-defunct "Windows Phone") as well as devices with damaged screens.

Figure 21: Worldwide Distribution of Android Versions (Active Users)



Similar challenges existed on both mobile devices

This may lead one to conclude that a web-based solution would, then be ideal, but, as indicated above, connectivity issues come into play, and browser version must be taken into account.

The only way to mitigate all of these issues, involves the standardization of mobile devices,

and laptops; in one case, a participant was told that their web browser would not support the exercise and was instructed to install a different web browser. After doing so, the player loaded the game—and was instructed to install the web browser they had been attempting to use previously.

% Active Users by Android Version

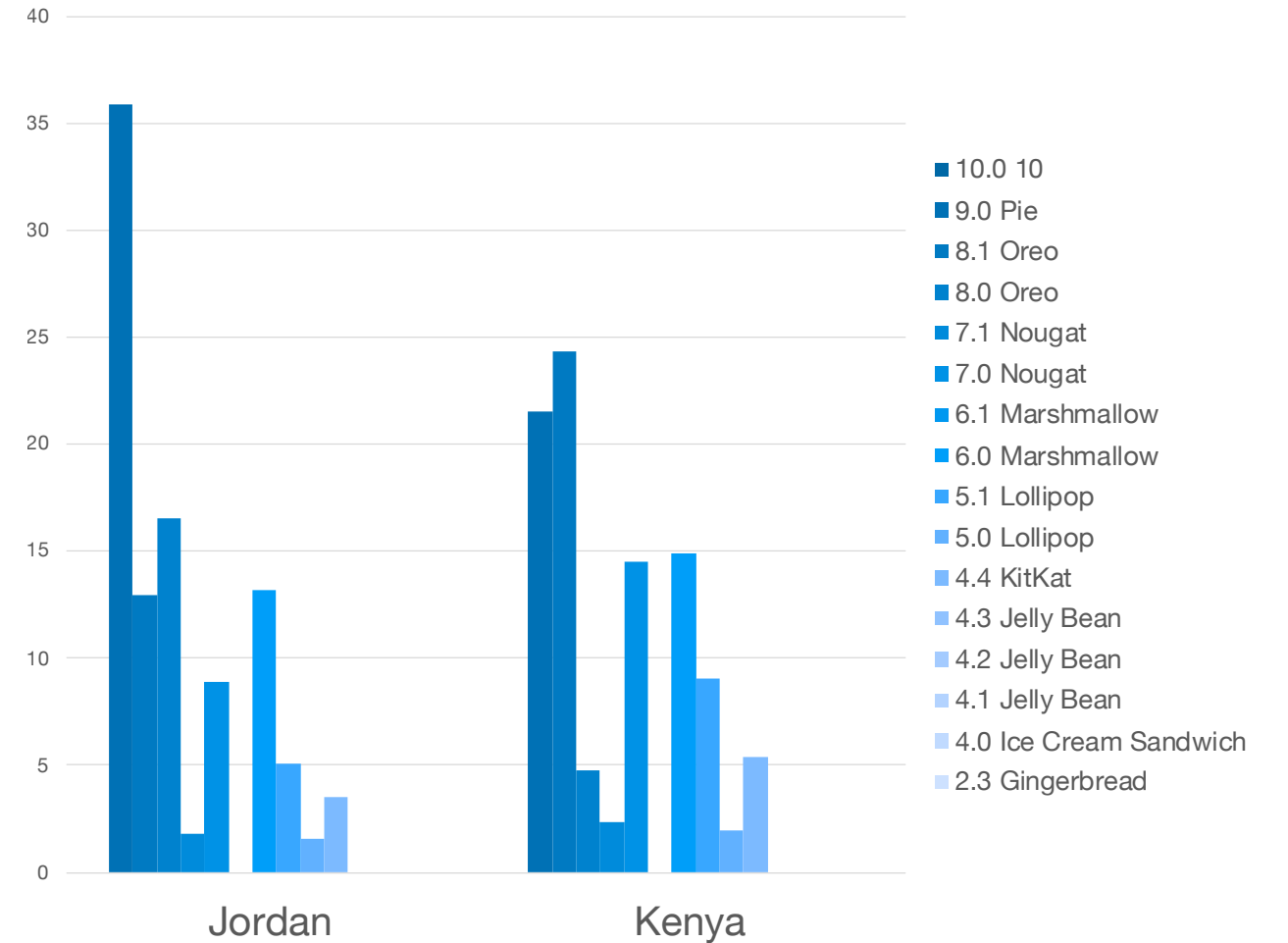


Figure 22: Android Version Use in Workshop Countries

Two broad approaches to digital games can be taken: games which are downloaded on use and run in web browsers (ie, using the now-defunct Flash system, Java, or HTML5), and those which are downloaded in advance. Both have advantages and disadvantages: games which run via web browsers typically run on most OS versions on which a modern web browser can run, including both mobile and laptop configurations (this does not include older versions of Android, however). However, web-based games are downloaded when they are played, and thus require a strong internet connection at the time of playing; this is not always possible in remote locations such as some field offices. These types of apps are also vulnerable to external changes to the game directly on the server: for example, during the course of our workshops, the design and hosting team of one of the games participants were interacting with changed the log-in method

to require more personal details and an email confirmation process. In addition, the directory structure of the website was changed, meaning the direct links to the game provided during the workshop were no longer functional. Because of the sudden changes, players were unable to interact with the game entirely for the final three workshop sessions.

Conversely, software which is downloaded in advance has the advantage of being more "portable" than browser-based games. It can be installed in ideal environments where internet speeds are high, or where connection speeds are slow, it can be downloaded in advance over a long period of time. This type of software can often be physically brought to remote locations on USB pen-drives or pre-loaded onto tablets. However, pre-loaded software must be programmed specifically to run on every OS environment in

which it will be used, including Android, iOS, Windows, OSX, Linux, etc. Even when extensive testing in various environments is carried out, errors or bugs requiring patches are common in the early stages of a digital game's lifetime. Pre-loaded software can take up significant storage space on devices, which is commonly in short supply on older smartphone models.

3.4.2 LANGUAGE

"I enjoyed the imaginary and participatory aspect to the scenarios, I didn't like the long readings and too much narrative in each story."

-PARTICIPANT, PRE-DEBRIEF WORKSHOP SURVEY

"You really had to read a lot of things."

**-PARTICIPANT, DIGITAL GAMES DEBRIEF
22 JAN 2020**

"I liked that the Liyla one had the option of Arabic language (which was the original language), the others were in English or English and French only."

-PARTICIPANT, PRE-DEBRIEF WORKSHOP SURVEY

Throughout the workshop schedule, presenting material in an accessible language proved to be a serious challenge. Both because of the limited availability of the learning games in languages other than English, and because of the linguistic limitations of the international facilitator. All games were presented in English. Participants were warned of this limitation in advance and were trusted to make their own decisions about their language ability. In the pre-exercise surveys, many participants confirmed that they played games primarily in English.

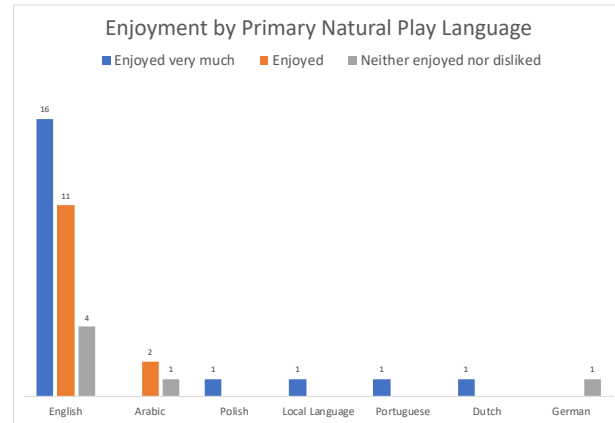


Figure 24: Enjoyment by Primary Natural Play Language

In some cases, even participants with otherwise very strong English-as-a-second-language skills struggled to access learning content. This impediment typically took one of two forms: either engaging with textual material within the game, or in processing rule-sets.

The digital games included in the workshop were typically intuitive to play, which helped to avoid the difficulty of understanding the rules. One advantage of digital games is letting the software handle the game structure (what actions are available to the player, processing the results of actions, etc), allowing players to focus on intuitive interaction with the user interface. Nevertheless, many of the digital games relied on large amounts of reading (dialogue, narrative descriptions, fictionalized reports, etc). These "blocks of text" were a challenge even to very

proficient English speakers. Some participants resorted to copy-pasting large portions of the game text into Google translate, where possible.

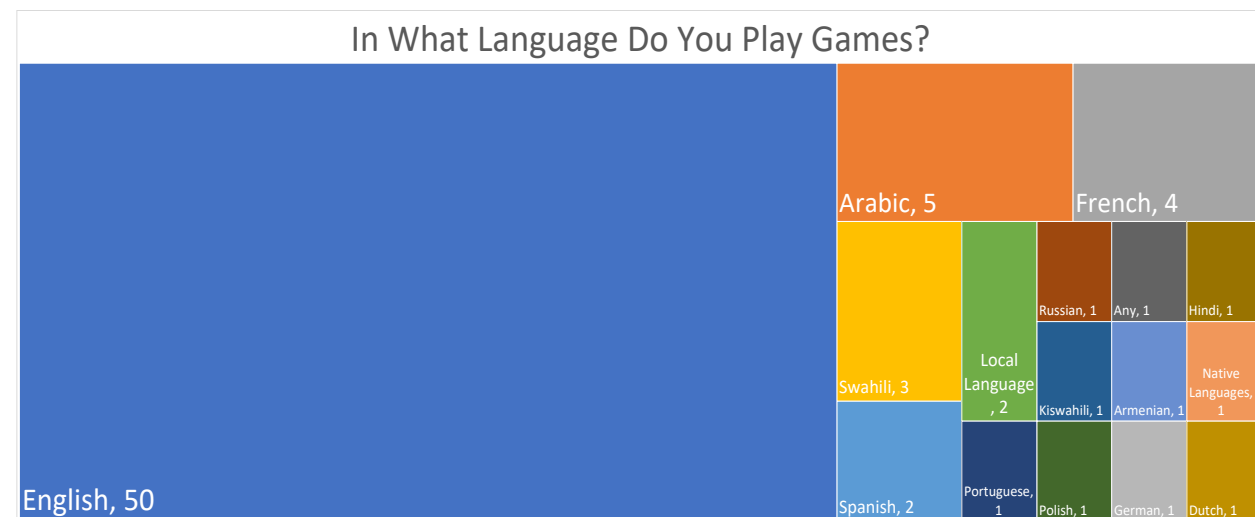


Figure 23: In What Language do You Play Games?

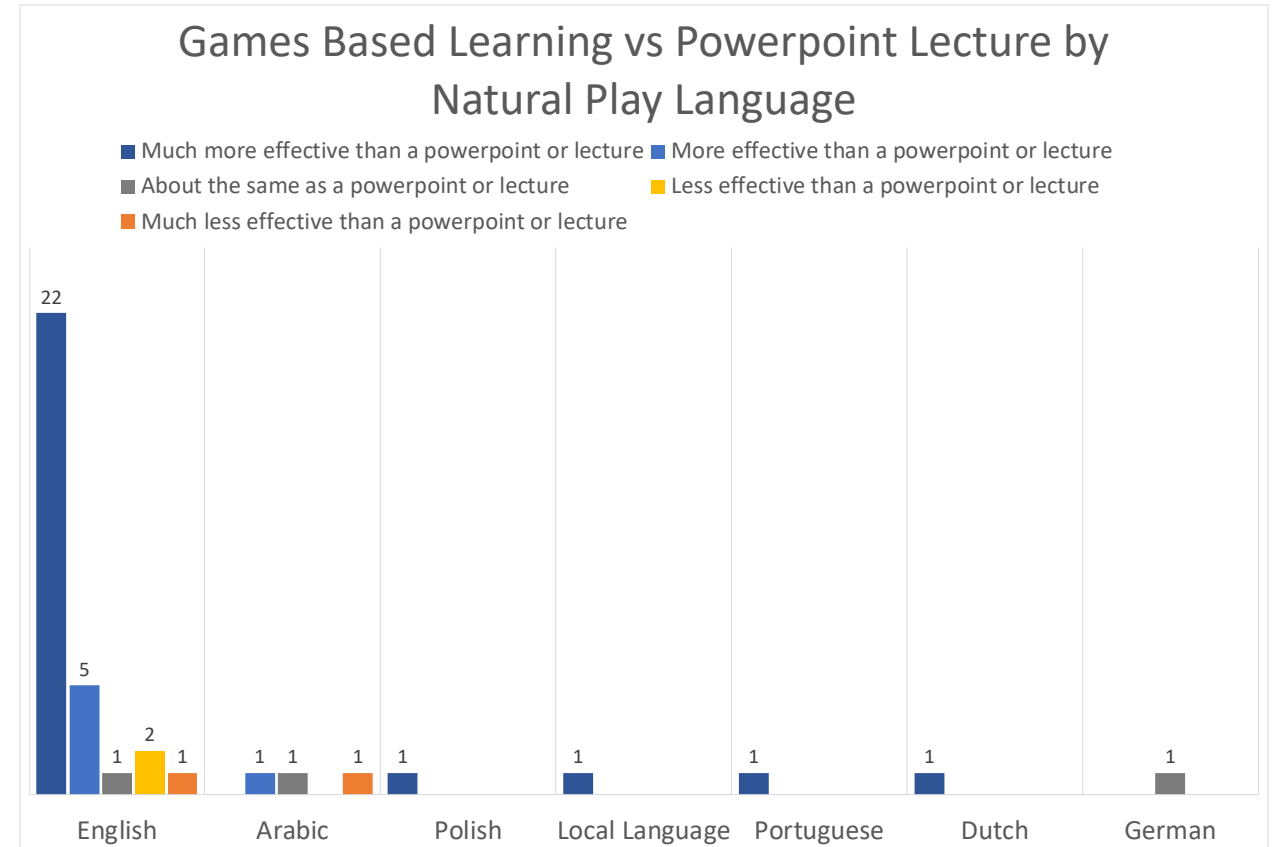


Figure 25: Impressions of Games Based Learning vs PowerPoint Lecture by Natural Play Language

The tabletop learning games used in the workshops were structured to require less reading during play, focusing on actions and reactions within a system rather than narrative progression. However, tabletop games require participants to ensure their actions fall within the rule-set. These rules are often nuanced and any complexities in the game cannot be offloaded onto the software. Even with an experienced

facilitator teaching the rules, reminding players of the rules, and "policing" player actions, small misunderstandings can lead to serious misinterpretations that can alter the course of the exercise and affect participants' learning.

Wherever possible, learning games should be translated into the first language of the participants. When asked what the most serious barriers might be to using learning games in their

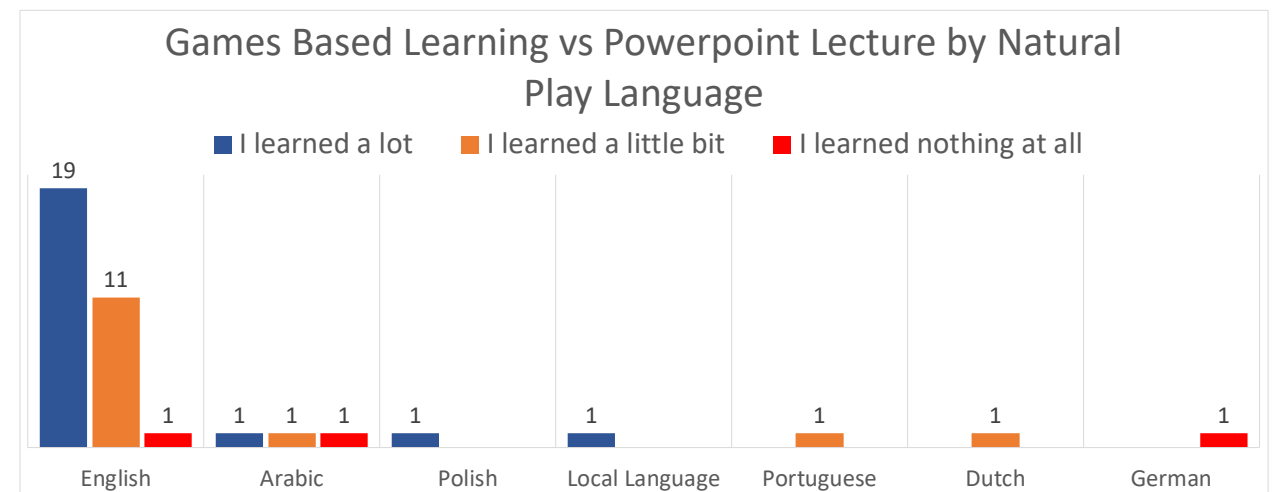


Figure 26: Self Assessed Learning by Natural Play Language

place of work, one participant responded: “Time, impatience, and, most importantly, language barrier. It would be essential for this game, or a game like it, to be translated into Arabic” (Post-debrief survey). Facilitation of the game should be delivered in that language as well. Digital and tabletop games present different opportunities and challenges in this regard. Translation of digital games requires the input of the programming team (or attention given to “modability” of a learning game), but once translated they are relatively straightforward to present. Tabletop learning games can quickly be translated in situ, but often require experienced facilitators who may not be fluent in the language of delivery.

It should be noted that, in developing game user interfaces universal visual cues can be implemented to mitigate linguistic barriers. This is equally true for tabletop and digital games. The use of icons and visuals in place of language has become ubiquitous, and the efficient use of iconic language in games can have a profound effect (see Section 6.4 UI/UX below for further information).

3.4.3 TIME INVESTMENT

“I think it depends a bit on the aim of it. If you want to make it a nice game to play for a broad audience, then it has to be short, and you have to be targeted like towards project management or maybe specific contexts. I really like the details and all the context background information because it is actually what you do in real life. So in that sense I really did like it, but I agree it's not something you can play, like, on your own.”

**-PARTICIPANT, DIGITAL GAMES DEBRIEFING
22 JAN 2020**

“I am not sure people would be willing to spend two hours playing this game at work. Maybe if it was after hours team building type of exercise.”

-PARTICIPANT, POST-DEBRIEF SURVEY

Learning games can require significant time investment in order to successfully extract and retain learning outcomes. Some tabletop games require a one-time session of 3 or more hours to complete briefing, gameplay, and debriefing. It can be a serious challenge for many humanitarian workers to commit this quantity of time to

completing a single exercise, even one which provides insight on complex problems difficult to examine via other means.

When asked (via a short answer question) to list potential barriers for employing learning games in their places of work, variations on “the time factor” (Post-workshop survey) were by far the most common response. As one participant explained, “In a training session, it would require a lot of time to get into it at first but it would pick up later. This could lead to a lack of interest” (Post-debrief survey). Another put it more bluntly: the games would be “Too long to get to any learning” in the workplace (Post-debrief survey).

Digital games, conversely, can be quick to play, but still must hold the participants’ attention long enough for the learning objectives to be relayed. Digital games are sometimes deployed in a context of independent rather than facilitated learning; if players become bored or disinterested, they will disengage outside of a structured environment. Ideally, digital games will be interesting enough to draw the participant back for repeated sessions, as this strongly supports retention of lessons. As the above participant concluded:

“Finding opportunit[ies] outside training sessions to play the game for those who have already learned how [would be helpful], because those who are able to play it would possibly get the most benefit out of it”

(PARTICIPANT, POST-WORKSHOP SURVEY).

3.4.4 BUY-IN FROM MANAGEMENT

“It seemed a little bit strange that it was called a game. Do you want to play ‘experiencing the life of traumatic situations’? And then afterward, being asked, ‘do you want to play again?’”

**-PARTICIPANT, DIGITAL GAMES DEBRIEF,
22 JAN 2020**

Support from upper management or other sponsors in decision-making positions has been identified as a key requirement for learning games to be effective (Brynen, 2019). Data collected in this research supported this long-standing challenge faced by advocates of games-based learning: participants commonly reported that a barrier to using serious games as learning tools would be acceptance by higher-ups. As one respondent explained, the biggest challenge to

presenting learning games in their workplace would be “just convincing my boss that games like this have utility” (Post-debrief survey).

Serious games are not yet widespread in the humanitarian sphere. In many fields, serious games have faced road-blocks in the path to being accepted. This is heavily predicated on the name of the method: a “game” is often incorrectly dismissed as a trivial or childlike exercise not worth serious consideration in the professional arena (McGonigal, 2011). These challenges are compounded by the prevalence of poorly executed learning games or analysis games; if not designed and implemented with care, a learning game can easily lend support to the preconception that such tools are “just a game”.

In many of the fields where serious games have seen acceptance, the practice and terminology have been adopted from military exercises (Brynen and Milante, 2012). This has led to the prevalence of the term “wargaming” as the most common cognomen for games-based learning and knowledge generation in business, health, and science fields, in addition to its wide usage in military literature (Hoffman, 2017). This discordant terminology presents further challenges to humanitarian applications specifically.

Even among military practitioners, where games and game-terminology have been used since the 19th century (Kreigspiel c. 1811), the term game can, with increasing rarity, carry a stigma. It is not unusual that the humanitarian sphere, new to the idea of serious games, would be reticent about adopting a learning method that is more often associated with entertainment.

4. THE MCGILL WORKSHOP

Concurrent with the workshops in Jordan and Kenya, a small workshop held at McGill University in Montreal, Canada, ran the tabletop game Aftershock.

The McGill Workshop was arranged opportunistically via pre-existing contacts among serious gaming students at the graduate and undergraduate level. The research team was curious to observe how a demographic familiar with gaming but not professionally familiar with humanitarian response would respond to the workshop as compared to experienced humanitarian professionals.

Student participants’ responses regarding their enjoyment of and engagement with the learning game were in line with the professionals’ responses. What became quite clear, however, was the McGill participants’ lack of familiarity with the vocabulary of skills associated with humanitarian work.

This led to a very important parallel, by which the in-country participants’ answers were ‘scored’. Where vocabulary and language may have been an issue, this flag provided guidance in determining the accuracy of participant responses, and served to solidify the method.

The McGill workshop participants, brought up on video games and with a strong familiarity of board games, demonstrated an analogous relationship to enjoyment and engagement with their professional, “non-gamer” counterparts. While the humanitarian practitioners were self-selected, they were not universally familiar with games; thus it was notable that the appeal of games based learning was nearly universal between the two groups.

Additionally, the debriefing process was similarly important to the McGill students and the humanitarian professionals, further reinforcing the universality of the brief-action-debrief process in positive learning experiences.

5. DIGITAL GAMES VS TABLETOP GAMES

This research included learning games delivered via two different media: digital and classroom-based tabletop games. Each has benefits and drawbacks.

For a brief overview of previously published research comparing digital and tabletop games, see Section 1.1.2. This research, while carried out with a limited number of games, nevertheless lends support to those conclusions.

Participants were more able to correctly identify the desired learning outcomes and skills imparted by tabletop games as compared to their digital counterparts. Demonstrated in Figure 9, participants were still clearly able to identify the tabletop game skills exercised two weeks after the workshop, while identifying only some of the skills concurrent with the digital games. All participants clearly identified tabletop skills, while roughly a third could identify correct digital game skills.

As discussed previously, participants' ability to correctly identify skills practiced were graded individually for accuracy (See Figs 9, 10). In that analysis, tabletop games scored much better than the digital games, and largely maintained good scores over time. While normal response attrition was observed, the degradation of memory shown in the data is consistent with expected outcomes.

Digital games offer a less flexible, but more structured learning environment. In general, digital games tested in the workshops tended to be more effective when they "kept it simple" and were short, direct, and had fewer and clearer learning outcomes - ie, they were built around individual skills or concepts that could be repeatedly drilled or memorized. They required less direct facilitation while participants were engaging with them, although many participants still required a facilitator for technical support and to situate the learning (via the debrief, for example). Participants were in general able to learn most of the rules of many of the digital games via in-system tutorials and/or well-designed intuitive UI.

This study did not directly examine the positive effects of repetition on memory and retention possible with digital games, as described in other research. However, some players described being enthusiastic about the ability to play the games again on their own time or to share them with colleagues and friends. It is much easier to arrange repeated runs with digital media, when specific numbers of people are not required to gather with a facilitator for a dedicated block of time. In the same way, digital games are easier to scale—but only where the technology is available. Digital games were a solitary experience in the workshops: the room fell silent, and people retreated into their cellphones or laptops. There was no urgency or excitement expressed in the room.

In contrast, tabletop games generated a great deal of excitement and urgency. Players considered social interaction to be an important source of learning about complex problems: misunderstandings, poor decisions made due to poor access to information and lack of time, consequences of one's actions on others—all of these were learning moments present in the tabletop exercises in a way that was not present in the digital games. Tabletop games, commanding a longer period of engagement and guided by a facilitator, were more able to tackle complex problems with multiple, overlapping learning outcomes. Tabletop games offer a more flexible structure and experience, in which the facilitator is able to proactively adapt the course of the game to guide players to specific challenges or experiences, resulting in more learning moments.

Tabletop games are not limited by technology, the benefits of which were evident during the workshops. However, tabletop learning games do require one or more in-person facilitators (even if only in the de facto sense of learning and sharing the rules with others) and tend to require both a minimum and maximum number of players. In the case of both learning games included in the research, Aftershock and The Day My Life Froze, having too many or too few players proved to be a challenge. The Day My Life Froze in particular is best implemented with two facilitators; during the workshops, one player was nominated to take on a leadership role because of this limitation. In all cases these challenges were overcome and learning was achieved, but only due to the on-the-fly adaptations of the game by

an experienced facilitator. Digital games do not offer this opportunity.

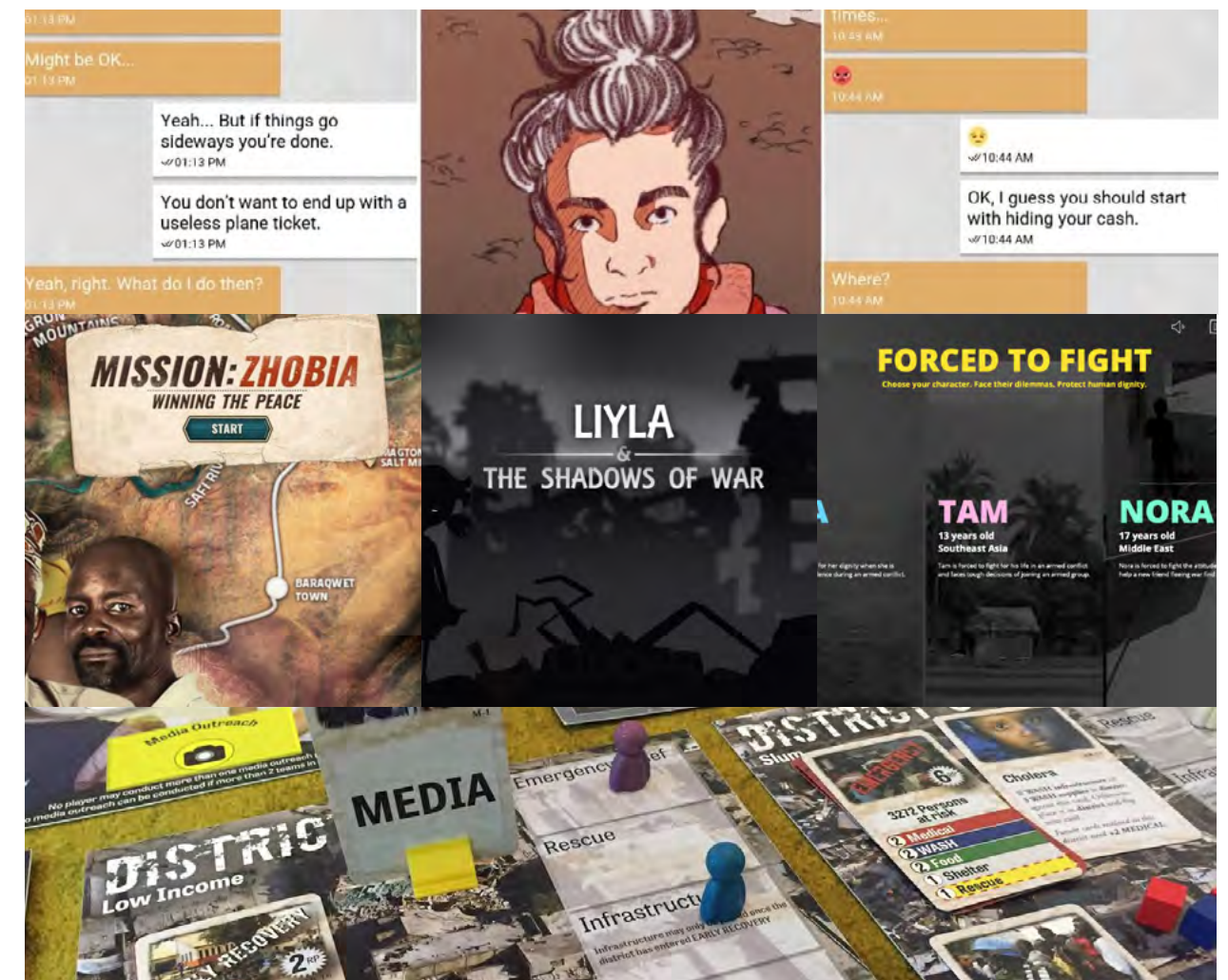
Multiple sessions of tabletop games are difficult to arrange due to the time investment, assembling the correct number of participants, and securing an experienced facilitator. This means that, while digital games can be great memory aids due to the simplicity of regular and repeated runs, tabletop games must generate powerful memories in only one session.

Workshop participants clearly indicated that they preferred the tabletop learning games to the digital learning games (See Table 2), stating that that they were both more enjoyable and more educational than their digital alternatives. It must be acknowledged that the digital games included in the workshop represented the best free tools the research team could find, while the tabletop learning games used were proprietary

games designed by the research team and offered for free. This may have indicated a potential difference in quality of the particular games employed, rather than the medium itself.

Additionally, while the participants' preference of tabletop games was clear, this cannot necessarily be taken as an indicator of learning. Preference and enjoyment have elsewhere been shown to have an effect on enthusiasm, motivation, and desire to replay in independent learning contexts.

As in all subjects covered in this section, it should be noted that at least some of the shortcomings of digital games could be mitigated by careful design and a well-structured system for software updates. More experimentation and research is suggested to explore the extent to which a well-designed humanitarian learning game could anticipate and mitigate at least some of the challenges listed above.



6. BEST PRACTICES IN HUMANITARIAN LEARNING GAMES

Over the course of this research, participants were able to lead the research team towards a non-exhaustive list of “best practices” for humanitarian game design.

6.1 WHY ARE WE USING A GAME?

“The game brings out the issues of coordination and allocation of resources very well. Seeing there are gaps in some areas and one party steps up to fill in the gap—when we all work together, it works better.”

-PARTICIPANT, AFTERSHOCK DEBRIEF, 21 JAN 2020

“I felt exactly how she felt [the person in the game].”

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 27 JAN 2020

Learning games can be extremely effective for a range of objectives, but they are not always the best tool for the job. Learning games are very effective for exploring “wicked problems” with no right answer, demonstrating complicated processes, depicting competing motivations, and explaining the real-life difficulties associated with problems that seem simple on paper. Games can help participants learn about working with stakeholders: how emotions and information flow are integral to cooperation and coordination, for example. Games allow participants to “actualize” lessons by applying skills learned previously. They build narrative, which can help participants to recall learning outcomes. Games can be employed for simple motivational purposes: games are engaging and can help convince participants to learn independently. One participant described how the game system of Aftershock helped them learn:

“The designers definitely, you know, wanted that experience where you step into it, you're confused. You don't know what's going on. There's too many rules. Yeah, you're like, what, what's happening? They did that on purpose, right. And they do try and overload you at

the beginning. And then as you go through it, you know, the challenges change. It's a bit funny how it started the game, you have two teams, it takes you almost as much time to make the decision for the two teams just at the end when you've got five.”

-PARTICIPANT, AFTERSHOCK DEBRIEFING, 28 JAN 2020

However, for some learning goals, a game might not function well, or function similarly to cheaper teaching tools. Trainers should consider whether the gains from a learning game over a traditional teaching method are truly worth the added expense. Typically, games work best when teaching about with complex problems with no clear right answer; these are often referred to as “wicked problems” or “complex problems” in the Cynefin framework: those problems in which cause and effect are difficult to deduce in the moment, but which do not require urgent action (Hoffman, 2017). Participants were learning about these types of problems in real time when they described the complex problems they faced: “Somebody says, ‘we have no medical supplies, we need medical supplies!’ And then every team gets medical supplies. Well, now we have too many medical supplies” (Participant, Aftershock debrief, 21 Jan 2020).

Game-based learning tools are only one part of a pedagogical toolkit. Learning game designers must be careful not to get “caught up” in the novelty of games-based learning to the exclusion of other methods. A traditional classroom (or e-classroom) setting still allows for deeper theoretical learning. Games and simulations in turn allow for active explorations and applications of theory that traditional classroom-based training does not. The best approach is almost always multidimensional, multimethod, and combines the best approaches of a wide variety of tools. It is not a coincidence that participants identified the debrief as a universally important part of the games-based learning process (See Fig 19). This combination of game and lecture/discussion exploits the advantages of each, framing the learning process and harnessing the full potential of these tools.

6.2 “GET TO THE POINT”:

“The obvious choices were the shortest. In some of the options, there was a question mark, where you could go get some more information. But if one picked the ‘good routes’ they were the shortest and didn't have much information. Then it makes you want to play again, but it feels repetitive.”

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 22 JAN 2020

“I think there was a forty-minute period where we were just doing the same things. Some more wrinkles would be good.”

-PARTICIPANT, AFTERSHOCK DEBRIEF, 28 JAN 2020

Throughout our research, the effectiveness of a learning game was correlated to the speed with which the lesson was delivered. In games which took a long time to “get to the point”, either in terms of time committed to playing or in terms of the game’s difficulty acting as a skill-based gateway to learning, many of our research participants were unable to extract the learning objectives from the tool. Clearly framing the learning objectives, and reinforcing this message through gameplay and interactions is a fundamental part of the games based learning process. Importantly, the learning game designer must eliminate, to the greatest degree possible, those elements which do not contribute to the learning objectives.

As learning game designers, we should not assume that game players will be willing to invest large amounts of time to reach the learning outcomes. This effect is at its worst when a game relies on misdirection to create moments of surprise: in Mission Zhobia, for example, some participants reported that the game seemed to be promoting the concept of humanitarian “white saviours”. In fact, one of the learning objectives of the game is to demonstrate the danger of such an approach, but if players did not interact with the game long enough to realize that they were being misled by their initial briefing (a rousing speech delivered by their country director) that lesson was worse than lost: players learned the exact opposite of what the designers were hoping to teach.

This negative effect can also occur when a game’s difficulty prevents less skilled participants from

progressing (and “unlocking” learning moments). As learning game designers, we cannot assume that our participants will come to our exercises with any pre-existing experience or familiarity with games. If a game demands participants have pre-existing “gaming skill” to progress, many learners will not be able to extract lessons. For example, the learning game Liyla: The Shadows of War is an action game which teaches players factual events about the 2014 Gaza War. Players must navigate a series of hazards such as gunshots and explosions via jumping and dodging. In its gameplay, Liyla resembles reflex-based games like Super Mario. Throughout the 6 workshops, only one player came to the game with sufficient skills to complete the game and have access to all the lessons the game has to offer. Conversely, many participants struggled to overcome the first challenge, and came away extremely confused about the game’s learning objectives. As one participant exclaimed, “Am I supposed to be learning how to dodge bullets in a war zone? I don't understand” (Participant, Digital games debrief, 27 Jan 2020).

This of course is a delicate balance: difficulty also relates to a players’ engagement in the game. If players become bored, they can be expected to stop taking part in the learning game. A learning game can certainly be complex or challenging without expecting players to come with pre-existing skills. This can be achieved via a good tutorial system, intuitive gameplay and UI which mirror real-life decisions, and learning closely coupled with the players’ in-game actions.

Both of these factors (time and skill required to access learning moments) are especially important if participants are expected to learn independently. In a classroom or controlled environment, a facilitator can force learners to engage for a set period of time; this effect was demonstrated clearly during our workshops. Participants may well have chosen not to continue with “boring” games during their private time, but in a controlled environment were forced to engage with the exercise long enough to extract learning outcomes. When the difficulty of a learning game is the primary issue, being in a controlled environment can help (the facilitator is able to observe if participants are struggling) but in this case being aware of the problem does not solve it.

6.3 THE GENRE AND STRUCTURE OF THE GAME MUST REINFORCE THE LEARNING GOALS

“The first time you do it, you do it very realistically. You try and imagine and think about what your decisions would be. But as you go through it, it becomes less realistic as you’re just exploring [the system]... in a more abstract way.”

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 21 JAN 2020

“But they could take the idea and put it in a sort of simulation. Say for example, you’re in a war zone. So what do you do? So let’s not really call it a game, but sort of like a simulation, like Temple Run something, but with any real data. But then, like, give more information, how do you what can you do when a bomb goes off? Or if there’s an earthquake, what do you do?”

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 22 JAN 2020

Games in which the actions carried out by the player reflect the real-life actions, decisions, or scenarios the learning game is attempting to teach about are more effective than those in which the players’ actions do not represent learning outcomes. For example, the game Mission Zhubia is successful in part because players are “playing out” interviews, research, and reports in ways which are analogous to those which real project managers experience. Similarly, in At-Risk, players conduct very realistic conversations with individuals facing mental health risks.

Conversely, the game Forced to Fight is less strong because, while players are making realistic decisions, they are not doing so in a realistic environment; players lack key information and inputs (such as community pressures, concern/fear, understanding of the environment or relationships) to make decisions in a way that feels natural or believable. Further, learning in Forced to Fight often comes via repeatedly interacting with the same narrative structures, making different choices when faced with a decision. Players quickly feel as though they are blindly “clicking through” options rather than considering their actions. Finally, as discussed previously, the game Liyla: The Shadows of War

closely resembles an action game such as “Mario”, and the result was often (although not always) missed learning opportunities and confusion. As one participant described their interaction with the game:

“To me it was entirely unclear what the goal was. So, like, okay, is it to show other people outside a war zone how horrible it is to live in a war zone? And then--I think it’s slightly inappropriate to make a game out of it. Is it, ‘how do you teach the people in a war zone how you can hide from missiles and jump over things?’ But it might also be a very personal thing because I don’t like violent games. So for me it wasn’t really teaching me anything. I couldn’t really understand what the whole idea behind it was.”

-PARTICIPANT, DIGITAL GAMES DEBRIEF, 22 JAN 2020

6.4 THE IMPORTANCE OF THE USER INTERFACE (UI) AND USER EXPERIENCE (UX)

“The images and the sounds brought you into it. They put you into a different mindset, which was good... Sometimes I think that when you’re trying to talk about work that you’re doing in this very traumatic scenarios and there are images used to try to make you feel a certain way, I don’t like that usually. But this I felt was, they weren’t really too exploitative. A lot of the images were kind of blurry and background, so it gave you an idea of the environment but without being, like, look at this sad person, you know?”

-PARTICIPANT, DIGITAL GAMES DEBRIEF 27 JAN 2020

“I appreciated the graphics of this game. It gives you a good understanding of what the context is. A lot of effort was put in the graphics, and it served the purpose of the game.”

-PARTICIPANT, DIGITAL GAMES DEBRIEF 27 JAN 2020

“When somebody is actually speaking, it brings you into it.”

-PARTICIPANT, DIGITAL GAMES DEBRIEF 22 JAN 2020

The matter of defining the difference between user interface and user experience is one of nuance, and creates a fair amount of debate in the back of design minds. For our purpose, the

concept (and cautionary tale) of UI and UX is best demonstrated in the visual above. While the path (or interface) above has been carefully designed and constructed, users experience their journey in an entirely different way, unanticipated by the designers.

The context of digital or tabletop learning games, the UI represents how the game is built: mechanics, visuals, rules, feedback mechanisms. UI corresponds with how players interact with a game. UX, conversely, represents the resulting thoughts, feelings, learning outcomes, etc – in short, what players get out of the game.

Particular attention must be paid to the experience provided by a learning game. It is particularly important that a learning game does not overload the student’s cognitive load, for doing so takes away from the ability to learn: when the processing ability of the brain is overloaded, one simply cannot process new information (Hodent, 2017). Digital games, in particular, must be designed with this in mind, as the controls for a game are inherently unnatural. For example, if we wish to speak to someone, we simply walk up to them, and strike up a conversation. In a digital game context, this must be translated into clicks, joystick movements, conversation tree selections, etc.

The goal of good user interface design is to “get out of the way”. The goal of great UI is to be virtually invisible. The interaction with the device will shape the user experience, ie, the intellectual and emotional feeling the user gets when playing the game. The more natural or intuitive this interface is, the more the student can focus on the learning experience.

There will always be some learning curve associated with a learning game. However, this curve must be short, supported with a complete and easy-to-follow tutorial, and ideally extend throughout the game. Ongoing support, both technical and on the subject matter, should also be available. This, too, contributes to the user experience as a whole. Given the vast range of backgrounds, languages, cultures, and abilities of the target learning audience, great care will have to be taken to be inclusive and proactively supportive in humanitarian contexts.

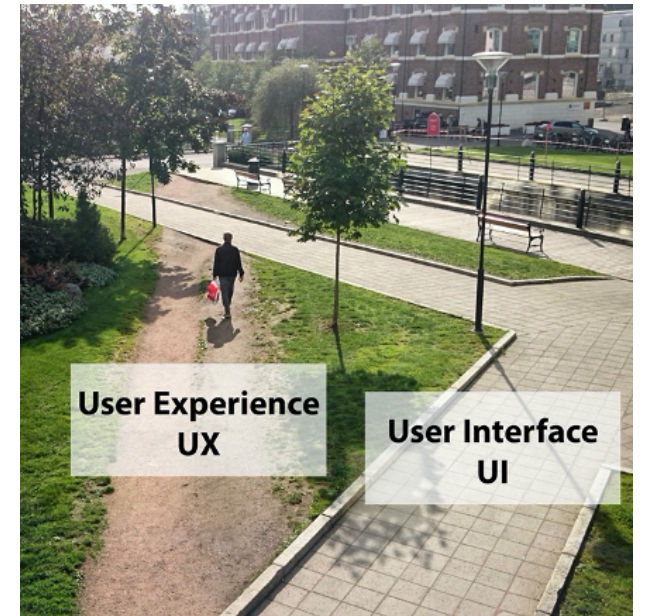


Figure 27: UI/UX Image ref. (<https://hellofuture.co/design-vs-user-experience-in-innovation/>, 2015)

For an effective rollout of multiple mobile learning games, it is not only important that the user interface is accessible to the target, but the user interface should be similar across games wherever possible. If a learning game’s interface is familiar, the learning experience will potentially be much smoother, as with the chat-based game Bury Me My Love. Chat and mobile communications have become ubiquitous in the modern age, so they are inherently familiar, adding little or no cognitive load. However, a highly technical rules-based game built around worker placement and resource management, like Aftershock is designed to place heavy cognitive load on the player. Such a game requires a certain level of familiarity with game mechanics to run smoothly from the outset. However, in this case, the initial chaotic learning curve is purposely exploited in the initial phases of the game to represent the confusion and shock of a humanitarian crisis. Aftershock is intended to be played by people familiar with games, or facilitated by individuals who have been trained to run the game. A games-novice could lose the purpose of the game in its mechanics, as those mechanics take up much of the brain’s processing power.

In order to reduce the cognitive load on students, a series of learning games should endeavour to have similar mechanics and a similar user interface. The student will only have to learn one interface which will serve them across the entire

series. Learners then can focus on the learning objectives, and not learning new interfaces or mechanics each and every time.

For a contrary example of poor UI leading to poor UX, in two workshop sessions participants were given the opportunity to engage with the digital game Finding Home. The game is similar in concept to Bury Me My Love, in that the player interacts with an app which reproduces chat and other functions of a cellphone. However, in Finding Home, players are presented with a wide range of simulated apps and chat histories. On some devices, the display is not clear. It is not immediately clear what options players are intended to select. Which chats are active? Which apps give them useful information? Is it important to read back through chat histories? The game does not provide direction or feedback to help guide the players' experiences. The result is confusion, often leading to the game being quickly dismissed.

Alternatively, At-Risk provided players with a very intuitive and easy-to-use conversational system. When players made mistakes in supporting simulated students in psychosocial matters, an on-screen advisor would "pop up" and provide suggestions on better choices, along with the opportunity to "go back" and select another conversational pathway. Clear feedback was provided in the form of a "status bar" which would increase as players provided helpful responses, and decrease when less effective responses were selected. In this way, players were able to start interacting with the game quickly, understood when errors were made, and were given a clear indicator of progress. As one learner said, "What I liked about it was that you really see how your responses and answers were influencing someone feeling comfortable or uncomfortable." Another added, "Like the pop-up from the lady who would help you along" (Participant, Digital games debrief, 22 Jan 2020). Here the user interface clearly supports the experience by providing what the player needs, in an effective unobtrusive manner.

Another important aspect of the user interface is the aesthetic appeal of a game. Attractive presentation of games can encourage players' interest and motivate them to continue playing (Hodent, 2017). For example, the game At-Risk was more interesting than a similar game "because

you can listen to it and see the emotion of the dialogue", according to one learner (Participant, Digital games debrief, 21 Jan 2020). When asked why Mission Zhubia was a favourite game, a participant replied:

"I think it had good graphics"

**PARTICIPANT, DIGITAL GAMES DEBRIEF,
22 JAN 2020**

In some cases, participants were able to specifically link good UI to better learning as well as greater engagement:

"In terms of gamification, having the bar at the bottom lets you know how you're doing, it makes it feel more like a game"

**(PARTICIPANT, DIGITAL GAMES DEBRIEF
22 JAN 2020)**

Conversely, the most poorly laid out games can leave players confused and struggling to interact with the game at all. UI does not necessarily have to be beautiful, but it must be clean, attractive, and useful.

Fundamentally, the user interface must serve the user experience. The interface must endeavour to be as seamless as possible to encourage a smooth learning experience.

As discussed previously, many linguistic difficulties may be mitigated through the implementation of a common visual game-language. Many games will use symbols and icons as language-neutral representations of ideas or concepts in order to transmit information quickly, in the most compressed manner. We see these icons around us every day: no smoking signs, washroom signage, traffic, and hazard infographics. UN-OCHA has developed a free visual lexicon of icons for the humanitarian sector. A standardized visual language across a series of learning games will benefit the student, and make the transition between game-based learning units near seamless.



Figure 28: UNOCHA Image: Humanitarian Icons, 2018 <https://www.unocha.org/story/iconography-part-un%E2%80%99s-humanitarian-efforts-ocha-releases-new-humanitarian-icons>

6.5 THE NEW "KISSES" PRINCIPLE: KEEP IT SIMPLE IN SCOPE AND SMALL

Games which are not clear in their intent can very quickly confuse would-be learners. This may be desirable in a commercial game where unraveling a mystery is the very experience a player seeks. Learning games, however, do not have the luxury of hours set aside by players to learning game systems, unravel mysteries, and build up a game-specific skill set.

Digital learning games, in particular, must be clear or they will overburden the player's cognitive load. We humans can only process so many things at once. If a game's goal is to impart knowledge, it is imperative the game gets out of the way of the learning objectives.

The subject matter of the humanitarian sphere deals with inherently complex adaptive systems. While a game can model this complexity, the method of interacting with the game must be as simple and intuitive as possible. The scope of any learning game should, in most circumstances, be intentionally designed relatively simple lest the player-student becomes overwhelmed by game-systems, when they really need to focus on the complex subject-matter-systems. The desired learning outcome should be simple in its scope, to help ensure it does not get lost in the translation between game and pedagogy.

A modular series of smaller games will be more digestible than a large scale game for most students. This is not to say the learning games cannot be interconnected, but the game experience should not be overwhelming at the beginning (unless this is a desired design element i.e. Aftershock). It is fundamental that learning games are seen as learning tools first, and the game system is the method of deployment of the learning objectives. As such, learning can be built upon other lessons, and developed in an organic fashion.

This approach necessitates that games be small, at least initially. Digestible quanta of learning, within limited available time, with a targeted scope will be far more effective than a large open world game with many different options available all at once, with many learning objectives jammed into a short time. This is a clear difference

between a commercial entertainment game, and a learning game. Learning games must not overburden their players, because the focus must remain on the pedagogical outcomes.

In addition, digital games should be kept relatively simple as designers experiment and learn about the opportunities and challenges of this new learning technology. For more on this, see Section 6.7, "Walk Before Running", below.

6.6 TEACHING THE REALITY RATHER THAN TEACHING THE IDEAL

"I thought it was misleading because it gives the idea that [rescue by humanitarian workers] is accessible everywhere. And that these programs are everywhere, which is not entirely the case. I mean, I know they're doing a great job with this family reunification programs. But it's sort of a pretense that all these horrible scenarios have a happy end. And of course, you cannot... well, you can include horrible outcomes in a simulation like this wouldn't be super nice. But I thought this was a bit too much. Like, ah, you know, you've experienced this—ah! Well, we've got a solution for that!"

**-PARTICIPANT, DIGITAL GAMES DEBRIEF
22 JANUARY 2020**

As in all fields of teaching, learning game designers must pay particular attention to the accuracy and relevance of their educational tools. However, while a lecturer may take pains to fact-check their lessons or a report-writer might strive to cite other publications to support their claims, ensuring accuracy is particularly difficult in the context of games-based learning.

As discussed previously, learning games are best used to explore complex problems in which cause and effect may be difficult to trace. The game designer's task is to represent these complex scenarios as accurately as possible, simplifying where necessary and attempting to model systems whose internal structure may not be clear. In these cases, it is very tempting to fall back on assumptions (made either directly by the designer or adopted indirectly via others). Unfortunately, a learning game which inaccurately represents a scenario can teach lessons which are incorrect, sometimes powerfully reinforcing misconceptions and stereotypes.

Some of the learning games employed included such oversimplifications. One participant noted that in a particular game, the scenarios

“always have some positive hope at the end. A lot them involved having some intervention by the UN or Red Cross or whatever. I think that part was a little bit not close to reality... if there were a large group of people to play this game at once, [you could include] based on the statistics of the scenario that you are recreating, to have a percentage of the room that is not going to be saved, and have it be more accurate, like the number of people who get that response of you were saved by the UN! You were saved when you ran past a UN vehicle that happened to be passing by and they saved you.’ But that would be a small percentage of the actual outcomes based on reality”

**PARTICIPANT, DIGITAL GAMES DEBRIEF
28 JAN 2020**

Many of the games made assumptions about the people they were representing. One player felt that the games made assumptions about how people should behave when affected by crises: “There’s a disconnect. We think they made mistakes in making the decisions they did, based on how I was trained to act.” (Participant, Digital games debrief, 21 Jan 2020). Another felt that people from affected communities were not represented as agentic:

“It didn’t seem to matter too much what you chose. And also, the options weren’t exhaustive. There was one situation where you could bandage your friend and take him back to your village, but it was also asking whether you wanted to join a militia or not. There wasn’t, like, help him and join the militia, help him but don’t join the militia. It wasn’t an exhaustive list [of choices]. So you kind of felt a little bit limited”

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27 JAN 2020**

In most games, designers were reluctant to represent humanitarian workers or agencies making mistakes. Caution in admitting fault is common in humanitarian work, where errors can have very serious ramifications. However, exploring how errors and mistakes come to be made is a powerful potential application of learning games.

Some games lacked representation of affected communities entirely, or represented other stakeholders imperfectly. However, as in all

models, certain aspects of a scenario are removed for the sake of simplicity and time. In these cases, omission of a certain community can be a learning moment. For example, in The Day My Life Froze, it is recommended during the debriefing to discuss important humanitarian issues which have been omitted from the scenario for the sake of streamlining the exercise, such as gender and health. In this way, learning can extend beyond the limits of the tool.

6.7 WALK BEFORE RUNNING

In developing a novel program of a series of learning games in the humanitarian sector it is important to realize the limits and experimental nature of the endeavour.

Very few structured humanitarian learning games exist to train aid workers. Games based learning is relatively new to the sector, and while this novelty creates a tremendous opportunity to disrupt the sector’s training regimes, this comes with danger. Investment of limited time and finances, as well as the potential for inadvertently teaching the wrong thing, call for some reasonable caution.

Even in the military sector, where wargaming is two centuries old, game designers make errors and missteps. The humanitarian sector should learn from these lessons, and proceed with

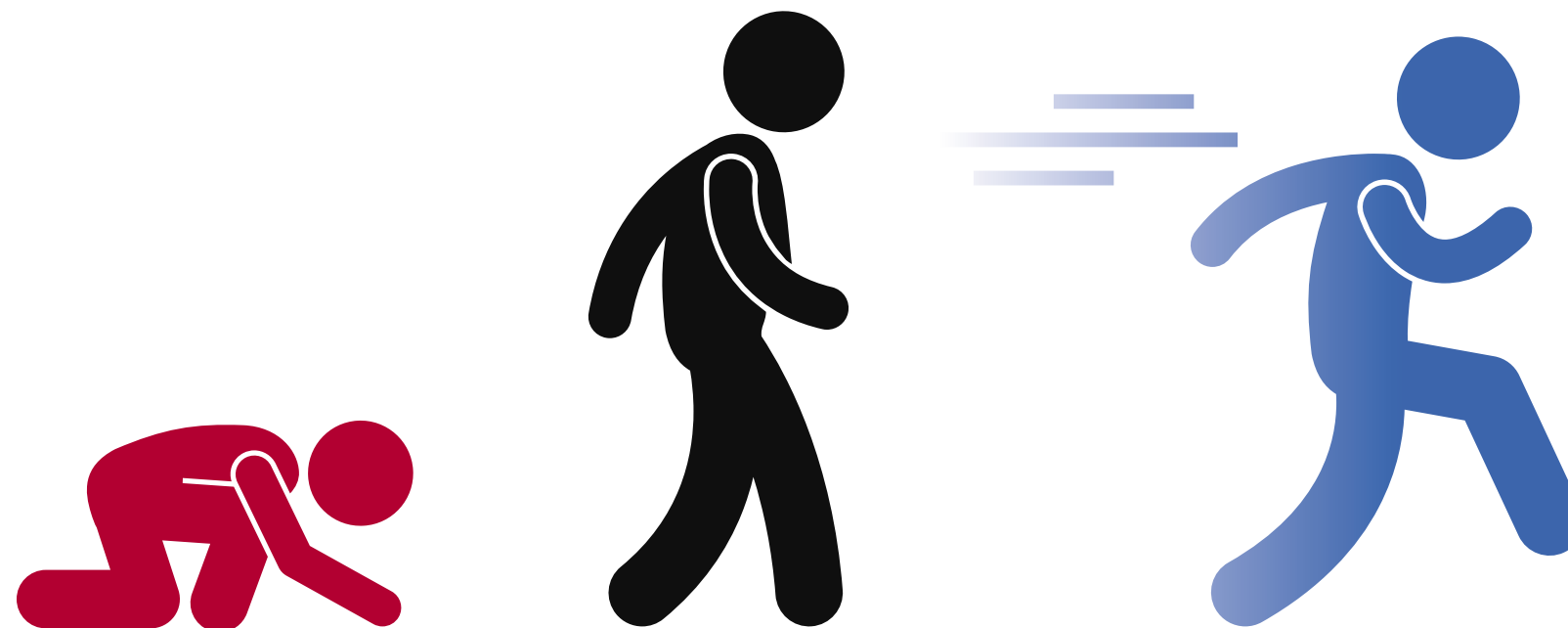
confidence and take reasonable steps before diving into this new world.

Game-based learning is not simply a puzzle or kit to plug into any learning scenario. Game design and pedagogical implementation depends a great deal on the learning outcomes desired, learning audience, budget, and organizational culture. The decision to implement a learning game must take these factors into consideration in order to maximize impact, and minimize downsides.

Before implementing a games-based learning solution, one must determine if game-based learning is a fit at all. This is far more easily done when the game is small, the learning outcome is targeted, the audience is clearly known (and relatively small), and the budget is palatable.

Small is better to start so the inevitable startup hiccups do not overwhelm and derail the long-term project and its goals.

Further, it is one thing to plan a game, design a game, and develop a game, it is another thing entirely to implement a game. Every new game needs playtesting. Smaller games can be playtested quickly, with relatively few resources. The larger a game, in scope as well as complexity, the more playtesting is required.



APPENDIX A: GAME FEATURES & TYPES

A.1 LEARNING GAME FEATURES

Successful, effective learning games share a number of common features:

Focus on Learning Objectives

Any effective game must constantly and consistently maintain its focus on the desired learning outcomes. Every element of the game should sharpen this focus, and not detract from it.

Involve the Player

The player/student must remain central to the learning-game activity, and an active participant. Passivity kills a game experience. A learning game must be interactive, with feedback demonstrating the learner's effects on the game-environment. If a player is not this deeply involved, then a game may not be the most appropriate learning tool.

Simplified Setting

A game environment may model a real world equivalent, but this model must be simplified. Models should be familiar, allowing the player to interact with the game-environment with relative ease and within expectations. However, extraneous elements will serve to distract the learner from the learning objective. One must very carefully consider whether an environmental game element adds to the learning objective focus or detracts from it. If it does not, it likely should not be in the game.

Player Agency is Paramount

Effective learning games include multiple paths to success, with multiple decision points for the learner. This player agency provides for experimentation and learning through failure in the safe environment of the game. This opens up replay possibilities, and the exploration of different tests to problems, implementing lessons learned in different ways to determine

what courses of action are appropriate, and most importantly: what decisions have dire consequences.

If a player is not an active participant, without agency over the outcomes of the game, then the activity is no longer a game.

Feedback, Feedback, Feedback

In-game feedback is essential to provide the learner with the needed input to take proper agency within the game. If a learner is to learn from mistakes, it is fundamental they understand where mistakes were made, and the amplitude of those mistakes. Additionally, it behooves a game designer to gamify the experience by rewarding the learner for good outcomes, encouraging right decisions, letting players know they are on the right track.

Post-game, feedback provides an opportunity to point out, in detail, where learners went wrong, and why, or where they did particularly well. This evaluation is fundamental to the learner so they get a deeper understanding of the consequences of their actions (good or bad), and provides the supporting educator with feedback to gauge learning, and adapt any adjustments that need to be made to the learner's educational path.

Challenge the Learner (but don't overwhelm them)

Learning games are environments wherein a learner uses agency to determine the outcomes of a series of actions and decisions on a game world. If the path and decisions are obvious, then learning will not take place: it is simply connect the dots. So a learning game must provide an audience appropriate experience, with an appropriate level of difficulty. Too simple and a game becomes boring, too difficult and player frustration risks disengagement.

As such, it is important to identify the target audience of a learning game. Ideally, the game's difficulty can scale with learner experience, or audience ability, but this requires design expertise and resources during development.

A.2 LEARNING GAME TYPES

Gamification

Various types of learning games can be implemented in a learning-game program:

Stand Alone Games

Wherein the game experience is tuned to specific learning objectives where mastery of the game means mastering the content. This stand alone game is almost a course in and of itself. Implemented for more experienced users, or where geography or resources prohibit instructor presence. A stand alone game should be accompanied by support materials and resources, preferably accessible in-game.

Simulations

Digital or analogue experience that is meant to simulate real-life scenarios when the real-life scenario is difficult, dangerous, or has cost restrictions. These safe-to-fail games provide immersive experiences wherein learners explore those scenarios they may be confronted with in the course of their real-world activities.

Mini-Games

Short game experiences existing within or alongside delivered course content. These games are implemented to reinforce, or test, specific, small learning objectives. They may be delivered in live face-to-face educational environments, or distance learning environments. They provide milestone benchmarks for students and teachers alike.

Interactives

Simple cause and effect interactions used to help the learner visualize or reinforce the key concepts of the learning objectives. These games are typically represented by decision-tree, choose-your-own-adventure games, wherein a pre-scripted narrative with several possible outcomes is played through to the end of a story. In a learning-game context, interactives can provide organizations with a relatively inexpensive, quick entry point into the world of game development. They can be quite simple or complex stories that explore many different learning areas.

Gamification is not a game. However, it is a feedback mechanism of motivation and encouragement that merits mention in our discussion. effective games, as discussed above, provide feedback to the player, encouraging play, and adds scoring, points, badges, achievements etc. to existing course content. Gamification is a very effective tool for motivating learners towards a desired goal. Gamification does not need to be implemented in the context of games, but can be added to any learning system. Easily implemented, with clear motivational factors, gamification merits exploration in any learning endeavour, particularly e-learning or distance learning environments where face-to-face teacher feedback is not available.

APPENDIX B: SUMMARY OF GAMES CONSIDERED AND INCLUDED IN THE STUDY

B.1 INCLUDED

Forced to Fight: <https://forcedtofight.ca/>

At-Risk: <https://kognito.com/products/at-risk-for-university-faculty-and-staff>

Mission Zhobia: <https://www.missionzhobia.org/>

Liyla and the Shadows of War: https://play.google.com/store/apps/details?id=org.liyla.war&hl=en_US

Bury Me My Love (prologue): <http://burymemylove.artetv/prologue>

B.2 CONSIDERED

Stop Disasters: https://www.stopdisastersgame.org/stop_disasters/

Third World Farmer: <https://3rdworldfarmer.org/>

Ayiti: The Cost of Life: <https://ayiti.globalkids.org/game/>

Inside the Haiti Earthquake: <http://insidedisaster.com/haiti/experience>

Finding Home: https://play.google.com/store/apps/details?id=org.unhcr.findinghome&hl=en_US

Syrian Journey: <https://www.bbc.com/news/world-middle-east-32057601>

Rebel Inc: <https://www.ndemiccreations.com/en/51-rebel-inc>

APPENDIX C: TRAINING, GAMING AND COVID-19

C.1. THE NEW REALITY?

In the wake of the recent pandemic, the issue of public health & safety issues as they effect the facilitation of tabletop games must certainly be considered. While tabletop exercises certainly necessitate a table, by their very name, such a table may, indeed, be virtual.

The digital realm of games need not be limited to pre-programmed applications. Instead, there are a number of effective, efficient platforms whereby tabletop simulations, exercises and games may be run in virtual environments. While lacking the full environment, and feel of a live, face-to-face interaction, these virtual spaces provide the ability to engage with an audience at distance, while keeping communications open, benefiting from facilitator and subject matter expertise, all the while respecting the need for public health and safety measures.

A virtual experience is unable to capture all the nuance of face-to-face human interactions, something so important in the field of humanitarian aid (we cannot remove the human from humanitarian), but in times of need, where circumstances dictate these interactions impossible (or unadvisable) the tools can provide an imperfect solution in an imperfect situation.

Virtual communications tools have been used extensively in our world over these past few years, and many will already be familiar with these tools. Further, excellent virtual classroom software exists to manage and deliver courses in distance learning environments:

Virtual Conferencing Tools	Virtual Classrooms
Microsoft Teams	Adobe Connect
Skype	BigBlueButton
GotoMeeting	Blackboard
Zoom	LearnCube
Google Hangouts	WizIQ
Google Classroom	Samba Live
Cisco Webex	

Finally, the games world has spawned several virtual solutions that directly support the distinct gameplay requirements of serious games. With virtual tools to represent game visuals as well as stochastic methods, and communications, it is possible to enjoy and leverage the advantage of games-based learning, virtually:

Virtual (Tabletop) Game Systems

Roll20
TableTop Simulator
Tabletopia
FoundryVTT
Vasal

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APPENDIX F: ABOUT THE AUTHORS

Matthew Stevens is Director of Lessons Learned Simulations and Training, an Ottawa-based professional development training firm for humanitarian and development workers which specializes in tabletop simulation and games-based learning. Matthew has worked with refugees and migrants globally since 2008, from downtown Cairo to the Peruvian Amazon. Before establishing Lessons Learned, he served as Country Director for an INGO in Amman, Jordan, delivering online higher education to displaced youth. Matthew holds a Masters degree from the Centre of Refugee Studies at York University, supervised by centre Director Prof. Jennifer Hyndman, one of the world's foremost feminist geographers. The findings of his research with Syrians living in urban centres in Jordan were presented to DFATD in 2014.

LLST is a pioneer in bringing simulations and serious games to the humanitarian and development sphere. Our tabletop-simulation-based courses and standalone simulations have been delivered to members of more a dozen humanitarian, academic, and government organizations including IRCC, DND, GAC, Oxfam Canada, CCIC, WUSC, Canadian Red Cross, CUSO, the Aga Khan Foundation, and more. Lessons Learned methodologies have been presented at the King's College London Wargaming Network's "Wargaming the Pandemic's Effects" Workshop, the Canadian Association for Forced Migration and Refugee Studies annual conference, the Connections North Wargaming Conference, the annual NATO O&RA Conference, UNOCHA's Humanitarian Networks and Partnerships Week, and other professional gatherings.

For more information on Lessons Learned, and to learn about how we are pivoting to online learning in the context of COVID-19, visit www.LLST.ca.

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Imagineti's Tom Fisher is a Serious Games and Simulation-Based Training Facilitator with over 30 years of scenario and games development experience. Following an academic background in Electrical engineering, and career in technology management, in 2004 he took a turn, away from the corporate world, and journeyed into the field of Special Education. Specializing in adults and adolescents with learning and behavioural difficulties, he developed, in conjunction with technology to produce successful outcomes. The program encouraged continued education, and eventual graduation in regular stream courses for these at-risk individuals at the Sir Wilfred Laurier School Board in Canada. From there on, Tom specialized in hybrid education, merging the powers of technology, pedagogy, and games based-learning/experiential education.

Tom went on to design games and training for over 100 NGOs and Agencies, such as the Crime Analysis Simulation Exercise System (CASES) for the World Bank's Financial Market Integrity and Stolen Asset Recovery group, and the Egmont Group's Strategic Intelligence Analysis Course (SAC), integrating traditional classroom work with a multi-faceted simulation. He was also game developer and graphic artist for AFTERSHOCK: A Humanitarian Crisis Game and AFTERSHOCK Expansion: Gender Dimensions of Humanitarian Assistance and Disaster Relief, as well as MaGCK the Matrix Game Construction Kit.

Currently, Tom is consulting on the development of the NATO SAS-129 Group's series of Cyber and Multi Domain wargames, as well as finalizing a complete course on Serious Game Facilitation and Design for policy building and analysis.

He has extensive experience in training delivery, and game facilitation, with small and large (100+) participant groups, all around the world, in face-to-face and virtual environments.

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