Establishing a Serious Game on Relationship Boundaries for People with Developmental Disabilities

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ABSTRACT

This research project aims to explore the gamification of information gathering related to social-emotional skills that are directly relevant to personal relationship boundaries. The target population of this game is adults with developmental disabilities. This game, titled "Boundaries," was developed because of the little to no supportive resources of sexual education for this community. Ten people with developmental disabilities later tested the game and provided feedback. Our results can be generalized into design suggestions for games like Boundaries as a vehicle to provide unique insights that can lead to awareness on issues that are faced by those with developmental disabilities in particular as well as those with other disabilities.

CCS CONCEPTS

• **Human-centered computing** → **Accessibility**.

KEYWORDS

Serious Games, Developmental Disability, User Studies, Design Evaluation, Boundaries, Relationships, Public Health

1 INTRODUCTION

Persons with Developmental Disabilities (PDDs) were sexually assaulted up to 10 times higher than a person without a disability in 2018 [17]. This misconduct and abuse is often never reported or addressed [9, 15], and every one in one thousand persons with a disability was the target of sexual assault [7]. PDDs were recently found to have the highest victimization rate in total violent crime [7]. Unfortunately, the U.S. Department of Justice has indicated that these statistics' rates towards persons of disabilities nearly doubled between 2010 to 2012 [7]

Trust is a critical factor in the assault on personal boundaries. In a study by Baladerian, 97 percent of sexual assailants on PDDs are in a position of trust such as caretakers (44 percent) and family members (32 percent) [1]. Shockingly, 55 percent of PDDs reported were found to be assaulted on more than 20 occasions [2, 6]. For women with disabilities, repeated abuse rates were found to be higher than 70 percent [16]. The Director of the World Health Organization's Department for Management of Noncommunicable Diseases, Disability, Violence and Injury Prevention, Dr. Etienne Krug, responds with, "the results of these reviews prove that people with disabilities are disproportionately vulnerable to violence, and their needs have been neglected for far too long... An agenda needs to be set for action"[18].

With our research, we disturbingly found the issue remains that PDDs are deserted of receiving legitimate sexual education that provides a better explanation of what they reserve the right to in a relationship. PDDs have been seen as asexual by the general public. Esmail et al. noted that because of this assumption, the research on sexual education or abuse towards people with disabilities is absent [5]. In her book *The Intimate Lives of Disabled People*, Kirsty Liddiard analyzes how the lack of sexual education and the consistent dependency of others meddles with any sort of intimacy PDDs wish to have [10]. In the wake of assessing various methodologies for sexual education for PDDs, Muccigrosso proposes that these lessons should be more participatory and relevant to their daily lives [11]. Muccigrosso also recommends that teaching preventative strategies should include topics on relationships and boundaries, knowledge on private body parts, OK/not OK physical contacts, and many more topics [11].

Our study's motivation stems from the low amount of research and resources on how to change the high number of sexual abuses towards people with developmental disabilities. Even more so, sexual education programs for PDDs available to the public falls short. This study intends to present a new methodology that will ideally start a conversation on addressing sexual maltreatment by providing a mindfulness environment for PDDs and others. In the past, serious games have been shown to be an effective medium for task based exercises with PDDs [3, 4]. We intend to explore positive learning resources with users on personal boundaries by creating a scenario-driven game suitable for PDDs. Subsequently, this study looks at how run-time data from such a game can be used to learn and determine certain risks.

2 GAME DESIGN

We designed a slot machine game that produced randomized scenarios adapted from a flipbook by Sexuality for All Abilities by

Mad Hatter Wellness, our collaborator. The slot machine game, named "Boundaries," was developed using Unity 3D Game engine and established a simple click interface to generate scenarios to execute smooth gameplay. Taking Muccigrosso's recommendations for better preventative methodologies, "Boundaries" incorporates a feature to customize more personal gameplay scenarios. To make the game more accessible for all users, the game provides links to video tutorials for better clarification of the game mechanics and a text to speech choice was available.

Users play the game by clicking on the slot machine's lever to show a scenario that displays as "Who," "What," and "Where," as shown in Figure 1. The users inquired as to whether the circumstance is "Okay" and acceptable or "Not Okay" and is intrusive of personal limits. The game does not have any winning or losing concept and can go on forever, just like a genuine one-armed bandit machine. This game is intended to encourage players to think deeply about the scenarios, and the data are meant to be utilized by a behavioral therapist to evaluate the level of comprehension of a particular person with developmental disabilities about personal relationship boundaries so that appropriate advice can be given in person. We chose not to have any meta reflection in the game as a piece of more personalized advice is needed to explain why a certain scenario is Okay or Not Okay. In our conversation with Mad Hatter Wellness, it became clear that the best way to make the scenarios memorable is to allow users to engage in a conversation of why certain scenarios were Okay or Not Okay.

A risk score was developed to aid behavioral therapists for straightforward identification of risky actions, with the goal of starting a conversation around awareness. In no way does this score assess the user's performance or tell them what's right or wrong in a relationship, but rather creates awareness if the user is accepting more risky scenarios. The Risk Score was calculated by applying statistics from the U.S. Bureau of Justice (BOJ) Statistics' Crimes Against People with Disabilities, 2009-2015 - Statistics Tables [7]. To record user's gameplay data, scenarios, answers, risk scores, and time between answering each question, we used the Microsoft C#.NET I/O library.

3 METHODS

We recruited participants through a partnership with a Hope Services Day-Center based in Santa Cruz who offer services for people with developmental disabilities [14]. With help from their professionals, protocols, survey questions, and run time study conventions were adjusted to best reflect feedback from participants during gameplay experience. Ten participants were tested in a private room at the University of California Santa Cruz with a research supervisor running the study. The supervisor utilized a MacBook Pro to run the game "Boundaries," a stopwatch, and a Muse 2 Brian Sensing Headband [8]. The ten users were composed of five male identifying and five female identifying individuals with developmental disabilities between the ages of twenty and thirty-five.

4 RESULTS AND DISCUSSION

The study assessed if "Boundaries" effectively provided an environment where users could practice mindful thinking with the
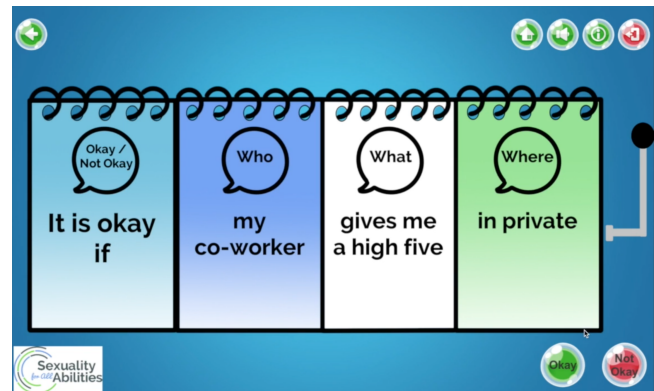

Figure 1: The in game user interface of Boundaries. A flip book is presented for the user to explore if the scenario is okay or not okay. Scenarios are randomized with through the one-armed bandit lever, which can be pulled upon making a final decision. There is no right or wrong user answer, but rather the scenarios are used to start a conversation about personal boundaries.

scenarios provided. Data was gathered from a post-gameplay survey that asked about the game's difficulty or enjoyment and if the user's understanding of personal boundaries has changed. Given these outcomes, we found that the users agreed on the scenarios' relatability and found the game accommodating in discussing personal boundaries.

Serious Games can be a powerful tool for users with disabilities to understand and learn about sensitive issues such as personal boundaries. Users self reported positive engagement in understanding the Boundaries gamified scenarios. Many wanted to play again and requested to have access to the game for use at home. Subsequently, we believe this method is fruitful in producing rich data. It acts as a fun, playful, and engaging environment for both the user and their caretakers to learn about risk as well as personal boundaries. Different habits and perceptions of scenario outcomes were autonomously recorded and identifiable by gameplay data logging. As a result, we found that users of varying risk held unique gameplay and physiological behaviors from gameplay, facial movement, and survey response. Users who were more aware of boundary violating scenarios considered the questions with greater caution. These users differed from other groups as they found the game to be the least challenging. Conversely, users who were more likely to agree to boundary violating scenarios found the game more challenging. These users self reported that the game was more difficult to understand, but reported that they fully understood personal boundaries regardless of the scenario answers.

The game "Boundaries" and the study had some limitations that should be considered for future studies. Our study only had ten users as PDDs come from a minority population. If possible, it is important to have a higher number of participants to support the study better and provide more diverse feedback on understanding risks and boundaries. Our post-gameplay surveys noted that users wished for the game to have characters, animations, or other visual elements to the game. Future iterations of games that include

animated characters may provide a better connection between the scenarios and the players themselves.

Furthermore, as we explore a future of personalized games to explore boundaries and relationships, we must note that it will be critical to continuing the direct involvement of communities with disabilities [12]. We must move away from the "fixing it" mentality of these communities and provide new resources for positive learning through that, as Seligman shares, achieves "effective interventions to build thriving individuals, families, and communities" [13]. Relationships are for everyone of all abilities, and perhaps traditional sexual education may greater benefit by shifting towards games of play to understand our own boundaries. We hope that this initial study will broaden our discussion of serious games as a playful methodology towards motivating more research on sexual learning resources for PDDs.

5 CONCLUSION

People with developmental disabilities have a higher percentage of sexual abuse, and unfortunately, society has often viewed these individuals as asexual or without the need of having intimate relationships. The absence of resources for individualized sexual education for people of all abilities should be changing; however, it has not yet happened. The issue first and foremost is the aggressor, and what we can do is to provide ways to identify who might be the assailant in people's lives. This paper looks at the in house developed game, named "Boundaries", a slot machine game that generates boundary related scenarios, and its success on providing a platform to evaluate relationship boundaries and risks cognitively. Ten participants played the game, all recruited from Hope Services Day-Center in Santa Cruz, whose gameplay data and post-gameplay survey answers showed promising results. The game was found to be an effective medium for creating awareness of personal boundaries. We hope this study will open a new dialogue towards research in playful learning methodologies for people of all abilities, shifting away from the fixing it mentality to positive discussions for thriving individuals. There still is much to be done in establishing a greater awareness of this problem, and we must work as researchers to stimulate creative solutions to help lower these high cases of abuse.

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