*Get Water!*: Exploring the Adult Player's Experience of a Mobile Game for Change

Emily Sheepy

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This is to certify that the thesis prepared

By: Emily Sheepy

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Signed by the final examining committee:

Dr. Saul Carliner Chair

Dr. David Waddington Examiner

Dr. Richard Schmid Examiner

Dr. Vivek Venkatesh Supervisor

Approved by Dr. Richard Schmid

Chair of Department or Graduate Program Director

André Roy

Dean of Faculty

Date April 15, 2015

**Abstract**

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**Research problem:** Games with civic themes such as *Get Water!* are intended to raise awareness and promote participation in social movements. Evidence linking the features of such games to specific player outcomes, including affective, cognitive and behavioral indicators of learning, is limited. The purpose of this study is to contribute to the literature on game-based civic education by conducting an in-depth investigation of the experiences of adult players of a social change game for mobile devices, *Get Water!*.

**Research questions:** (1) How do players experience *Get Water!*? (2) How do players evaluate *Get Water!*? (3) Does playing *Get Water!* influence players' attitudes, thoughts or actions related to the social issues it addresses?

**Literature review:** Previous research suggests that prior experience may influence how players interpret video games. Though some games with civic themes have been found to positively affect player attitudes and promote learning, the mechanisms are unclear. Design features of such games, especially content-mechanic integration, are likely to influence attitudinal, cognitive and behavioral learning outcomes of play by structuring the player experience.

**Methodology:** A qualitative case study approach is used to characterize the experiences and evaluations of 22 adults who played the game in a laboratory setting. Participant data was collected using a think-aloud procedure, post-play questionnaires, semi-structured interviews, and a one-month follow-up questionnaire. External data, including game design documents, were also examined. Descriptive and interpretive analyses were conducted to develop a detailed description of player-game interactions and player perceptions.

**Findings and Conclusions:** The data suggest that the participants' evaluations of the game were informed by their personal experiences of the social issue depicted, and values with regards to teaching and learning. As such, their interpretations of the game's content and perceived effectiveness varied greatly. Notably, the interpretations of players who had personally lived in

regions where water scarcity exists interpreted the social messaging in unexpected ways. While the players largely enjoyed the game and viewed it positively, some indicated that the in-game activities were not sufficiently representative of the real-world scenario to afford a transformative educational experience. Misalignment between in-game objectives and real-world motives, and limited character and narrative development may account for the players' experiences of low affective identification with the player character. Some players engaged in discussion and sought information about the subject matter in the month after the laboratory session. The findings and implications contribute to a conceptual understanding of how differences at the player level can influence how a social change game is experienced and evaluated. This suggests that social change game designers and education practitioners should prioritize representational verification efforts to better accommodate diversity in players' prior knowledge.

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## Chapter 1—Background

The purpose of this chapter is to contextualize the proposed study. I will first explain how I became interested in this research problem; next, I will briefly introduce the concept of civic gaming; and finally, I will describe the purpose of this study and its relevance to the field of educational technology.

### Emergence of the Research Problem

Since fall of 2012, I have been working on the Civic Gaming research project with Drs. Waddington, Venkatesh, and Davidson in the Department of Education. This project investigates the civic education potential of commercially available video games.

I was tasked with reviewing the literature on civic applications of *casual* games specifically—how games that are relatively simple, short, and easy to play have been used to promote the development of knowledge, skills and dispositions relevant to engaging in public affairs.

In 2012, Decode Global—a local Montreal start-up company—partnered with Concordia University's Hexagram Institute and community organizations such as Women for Water to design and develop a video game intended to raise awareness of the relationship between water scarcity and girls' access to education globally. The resulting game, *Get Water!*, was marketed both as an action game for a general audience and as an educational game. There is evidence that the game has been judged suitable for the latter purpose:

- The project's design was one of five winning submissions in the Create UNAOC 2012 challenge (United Nations Alliance of Civilizations, 2012) and received the "Power 2 Women!" World Summit Youth Award in 2013;
- The game received positive reviews in the press, including a feature in Forbes (Shapiro, 2013); and
- Approximately 4000 educational licenses have been purchased for the game (A. Mannella, personal communication, November 25, 2014).

Because the game was being developed locally, I had the opportunity to spend time with the game's development team, participating in playtests and exploring the game's early design

documentation. It soon became apparent to me that this game offered a unique opportunity to examine how socially and culturally relevant learning goals were implemented in a casual video game, and how the design of this game was subsequently received and interpreted by players.

As a gaming enthusiast, the idea that video games could be used effectively to promote conscientious participation in society is highly appealing. I strongly believe that video games can be powerful vehicles of expression and are inherently interesting as creative works. However, as an instructional designer, I carry a fair degree of skepticism regarding the effectiveness of games that claim to be 'educational', particularly when they are (1) developed primarily for commercial purposes and (2) intended to promote affective and socio-behavioral learning objectives, rather than increasing knowledge or procedural efficiency. This skepticism is drawn in part from my experience as a practitioner—defining sensible and measurable attitudinal learning objectives is notoriously difficult. My personal misgivings are compounded by evidence from the discovery learning literature that exploratory and discovery-based learning approaches are not very effective when instructional scaffolding is absent or when guidance not tailored for learners' age and prior knowledge (de Jong & Lazonder, 2014). Learning opportunities certainly exist in video games, but in my view it is unreasonable to expect all (or even most) learners to construct a specific repertoire of knowledge and associated competencies just because the necessary content is simply *present* in a game. However, proponents of serious and persuasive games about social issues have offered compelling reasons to believe that video games can and do promote certain objectives effectively, which I will briefly review next.

**The Promise of Gaming for a Cause**

Civic engagement among young adults both in Canada and in other developed nations is thought to be declining, inspiring scholars to explore nontraditional means of public outreach (Chareka & Sears, 2006; Flanagan, Levine, & Settersten, 2009; Kahne & Westheimer, 2003). A growing body of evidence suggests that video games containing civic and prosocial messaging may promote participation in community life. A comprehensive Pew Foundation survey of American teenagers' gaming habits found that players of civically oriented video games were more likely to be civically engaged, and that the experience of civic learning in gameplay

contexts may be more equally distributed among young people regardless of age, gender, and race, than other civic engagement activities (Lenhart *et al*., 2008). Thus, public education through video games may reach a broader audience than other campaigns. It is important to note that video games targeting social problems rather than formal politics may have particular cachet with civically active young adults. Research consistently suggests that overall engagement is in decline because citizens are opting out of formal politics in favor of non-political volunteerism and cause-related advocacy (e.g., signing petitions, consumer activism); in particular, Samara Canada (2013) reported that young Canadians between the ages of 18 and 34 are actually *more* engaged in discussion of political and social issues than adults 35+; the younger cohort reported higher rates of discussion via email or instant messaging (42% vs. 26%), as well as discussion face-to-face and by telephone(51% vs. 42%), and 30% of respondents aged 18-34 had circulated or reposted political information online.

*Get Water!* exemplifies a growing trend of digital game development and sponsorship by international governmental bodies (e.g., UNICEF, USAID) and non-governmental organizations, who hope to harness the engaging qualities of interactive new media to increase public awareness of global public affairs and to increase community participation among young people. Other exemplars include the World Food Program-sponsored game PC game, *Food Force* (Konami, 2005); its successor, the *Food Force* Facebook game (Konami, 2011); and MTV's *Darfur is Dying* (MTV, 2011). There is little doubt that more digital games aimed to communicate social agendas will be created in the coming years, as organizations such as UNESCO continue to sponsor design competitions (e.g., the UNESCO MGIEP Gaming Challenge). Indeed, over 130 social impact games have been documented by *Games for Change* project at present (www.gamesforchange.org); this project, established by the Woodrow Wilson International Center for Scholars, has amassed an impressive collection of games and resources on the design and evaluation of such products, and supports the development of games for social impact through its annual design competition (Blumberg, Almonte, Anthony, & Hashimoto, 2013). Given the rising popularity of game-based approaches to civic learning, there is a need to carefully examine how players experience such games, and how civic games function as educational tools.

**Purpose of this Research**

The purpose of the present project is to investigate how players of *Get Water!* (Decode Global, 2013) engage with a particular social issue: water scarcity and its impact on girls' education. Using multiple source of evidence, my aim is explore how players experience and evaluate the game experience, and how their judgments of the game relate to their participation in civic life. Key learning outcomes to be explored include critical reflection, information-seeking, engagement in conversation about a social issue, and direct action related to that cause.

## Chapter 2—Literature Review

The purpose of this chapter is to situate this study within the current literature: at the intersection of research on player experience in educational video games, theoretical research on civic education, games-based learning, and empirical validation of persuasive games. I will begin by presenting my research questions.

### Research Questions

This project addresses three broad research questions:

1. How do players experience *Get Water*? That is, what do they perceive in the game, how do they interact with it, and ultimately, how do they respond to the experience?
2. How do players evaluate *Get Water*? That is, what expectations do they have, what information do they use to form their judgments, and how do they prioritize their valuations?
3. Is there evidence that playing *Get Water!* influences players' attitudes, thoughts or actions related to the social issues it addresses? If so, in what way(s)?

To contextualize these questions, I will first explain what it means for a game to be "civic". Second, I will discuss learning in the context of civic gaming. Finally, I will briefly review evidence on the effectiveness of civic video games in promoting attitudinal, cognitive and behavioral outcomes.

### Civic Education and Civic Games-based Learning

For the purposes of this investigation, I have adopted the definition of "civic gaming" offered by Raphael *et al.* (2010), who hold that "games foster civic learning when they help players to develop *knowledge*, *skills*, and *dispositions* that players then apply to public matters in the world outside the game" (p. 203). Table 1, below, provides examples of civic learning objectives drawn from a review by Brammer *et al.* (2012), that illustrates the great variety of outcomes that might reasonably be targeted in investigations of civic games-based learning.

Table 1.

*Examples of civic education learning objectives, adapted from Brammer et al. (2012)*

| | |
|---|---|
| Dispositions | • Interests or beliefs about the self as an active citizen;<br>• Self-identification as an active citizen<br>• Positive valuation of various concepts commonly held in civic society (see "*Knowledge of civic values and systems*") |
| Knowledge of civic values and systems | • Concepts including efficiency, equity, social justice, and community participation<br>• Current affairs<br>• Political/Legal systems and processes;<br>• Concepts of government<br>• Concepts of responsible citizenship |
| Skills | • Critical reasoning about causes and morality<br>• Critical reasoning about policy<br>• Assessing the feasibility of change from social action<br>• Inquiry<br>• Communication<br>• Social organizing |
| Experiences | • Community service<br>• Social organization for change<br>• Project planning<br>• Relationship-building<br>• Process of engagement |

Note that this sample of learning objectives reflects the goals of social science education more generally, not just civic education. They do not just target the acquisition of factual knowledge, but also beliefs and attitudes drawn from discursive practices such as abstraction, inference, and engagement in critical inquiry when presented with new information (Newman, 1987). Bogost (2007) notes that educational games designed to target such objectives are inherently

*persuasive* in intent—this implies that in some cases a 'failure' to observe change in players for certain learning objectives, particularly beliefs about the self or the value of particular citizenship practices  may not actually suggest that a game does not provide an educational experience. A player may critically evaluate a game's content and simply reject the values it is intended to promote. Therefore, indications that a player is able to identify civic content and evaluate messaging should be carefully considered when investigating the educational potential of a particular civic game. In the conceptual framework presented in Chapter 3, I will revisit the notion of civic games-based learning by examining how such learning objectives may be integrated into video games.

**Reflection and Learning from Video Games**

Miguel Sicart (2009), a leading video games ethicist, argues that video games provoke critical reflection in players, and can provide stimulus for engagement with societal issues. Experiential learning theorists have stressed the importance of reflection as part of the learning cycle, for example, Kolb (1984) argues that reflection encompasses crucial cognitive processes by which learners integrate new knowledge with prior knowledge and resolve resulting conflicts. Reflection-inducing activities often play a central role in pedagogical strategies applied in social science education (Rainey & Kolb, 1995). Reflective activities are used to encourage learners to consider their experience of learning new material from different perspectives and examine their opinions, assumptions and judgments related to the material; this is thought to facilitate the development of generalizable principles that learners then apply to their own lives (Kolb,1984). Communication theorists examining the success of public awareness campaigns have similarly proposed that cognitive reflection, where the media consumer revaluates new information relative to prior knowledge of society and societal norms, influence the impact of engagement campaigns in terms of subsequent engagement in discussion (Goodin & Niemeyer, 2003; Cho *et al.*, 2009).

The goals of civic and social science education in formal settings include more than just the acquisition of knowledge. Equally important are attitude change and development of the willingness to participate in change processes intended to address societal inequality due to differences of race, class, and community (Rainey & Kolb, 1995). Public awareness campaigns

such as “Games for Change” are intended to achieve similar goals in an informal setting; as such, it’s important to examine *how* and *what* players reflect on when interacting with the content of media produced in such campaigns to inform future design processes. Indeed, investigation of player reflections may be vital to understanding why some players of social change games go on to engage in cause-related civic behaviors such as donating money, learning more about the subject, and sharing or discussing such games with others.

Building on Bogost‘s (2007) theoretical examination of how video game designers communicate arguments through multiple rhetorical modes (visual, verbal, and procedural), Raphael, Bachen, Lynn, Baldwin-Philippi, and McKee (2010) argue that variations in game design directly affect the extent to which players are cognitively engaged in reflection about the civic content presented in the game (see Chapter 3). It is unknown, however, to what extent players themselves perceive or evaluate these constraints on their access to information about social issues within games. Indeed, Sicart (2009) argues that game design constrains the extent to which civic content informs the player’s perceptions of gameplay, and that to be most effective the content must be integrated "within any level of abstraction that is observable and relevant for the player" (Sicart, 2009, p. 201). In his view, the understanding of how the game functions as impetus for reflection must be developed through examining the player’s experience of the game, rather than the design alone.

In his model of game interpretation, Sicart (2009) instead focuses on how players resolve the interactions between the values and experiences of the user and values expressed in the game’s design. Sicart (2008) also argues that players interpret a game’s representation of the world both through its procedural abstractions and its semantic abstractions. Figure 1 depicts Sicart’s model of game interpretation.

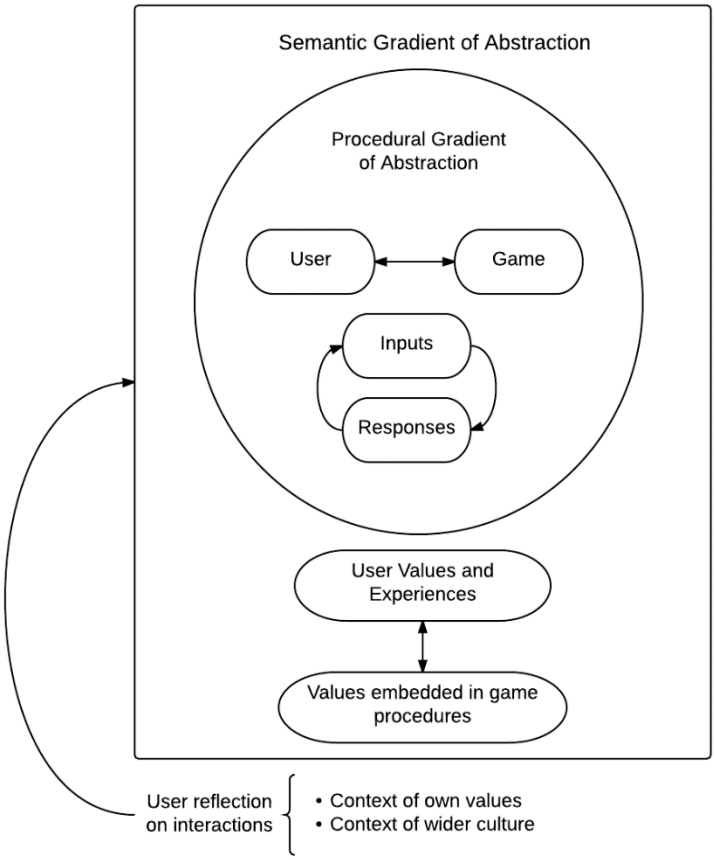



*Figure 1.* Sicart's Model of Game Interpretation. Adapted from "Education from inside the bunker: Examining the effect of Defcon, a nuclear warfare simulation game, on nuclear attitudes and critical reflection" by D. Waddington, T., Thomas, V. Venkatesh, A. Davidson, K., Alexander, & T. Gallant (2014). *Loading..., 7*(12).

Sicart's *procedural gradient of abstraction* comprises the mechanics and programmed simulation within the game; while the *semantic gradient of abstraction* comprises layers of cultural meaning that connect in-game activities to the player's community, cultural values, and information available outside of the game experience (Sicart, 2008). He claims that interpretations drawn from interactions with these cultural resources are evident in "the reasons why players are emotionally attached to the game, understand how to play it, and take choices" (Sicart, 2008, p.9).

Sicart's conceptualization of game interpretation as a process situated in a cultural context is compatible with concepts of learning drawn from the e-learning and computer-supported learning literature. It is important to acknowledge the greater context of a social change game as a learning experience that is not simply associative and cognitive (building on reflection and abstraction), but as a process situated within its environment (Young, 2010) and a community (de Freitas and Neumann, 2009). In the case of *Get Water!*, the game affords the experience of social connection between the player and the activist community supporting its cause, between the player and other gamers, and between the player and his or her online social network. The player's experience of *Get Water!* may be influenced by these affordances.

Re-examining game designs from the player's perspective is likely to yield interesting insights into how players interpret them. For example, Arora and Itu (2012) surveyed the design goals and persuasive strategies for a small sample of digital games employed by international non-governmental organizations to raise public awareness. Arora and Itu offer the critique that most such games are better described as social marketing tools rather than educational games, claiming that they are unlikely to deepen players' understandings of complex issues. They assert that this weakness arises from three common traits: (1) information is transmitted using a top-down pedagogical style; (2) thematically relevant features of games may only be recognizable to people with prior knowledge, and novel learning opportunities are few, which suggests that the target audience already supports the cause; and (3) the educational strategies used to promote activism rely on moral and emotional influence rather than critical thinking. The theoretical objections raised by Arora and Itu are relevant and suggest potential reasons why these games may not fulfill their promised potential. In particular, their analysis suggests that some players confronted with a purportedly educational game may not experience it as an educational experience at all, and might even be frustrated by the presence of "inside information" that they do not understand. The centrality of *learner analysis* to their objections seems particularly important when considering how individuals with varied levels of prior knowledge may approach and interpret games like *Get Water!* If the player in Sicart's reflective play scenario is conceptualized as a participant in an experiential learning experience (Kolb, 1984), then learning would be expected to be influenced by the

player's ability to perceive, recognize and resolve conflicts between prior experiences and in-game experiences, as well as their preferences for learning via different processes. Players who already possess "inside knowledge" of an issue may decode the representations in a particular game more readily, but may also have pre-existing notions that conflict with the game's content, and shape their reactions to it. This suggests that to understand how a game functions as impetus for reflection, differences may be found at the individual player level. Different players may vary in how they interact with the game, and therefore what information is salient and available to them.

**Effecting Change: When Are Civic Video Games Convincing?**

Past studies of civic video games have largely focused on perceived learning and attitude change after gameplay, but relatively few have examined behavioral change. Civic casual games have been studied in numerous contexts, including: changing attitudes toward the homeless (Lavender, 2011) and the working poor (Newman, 2012); Ruggiero, 2014), influencing belief in stereotypes about national groups (Alhabash & Wise, 2012), promoting volunteerism (Jianqiang *et al.*, 2011), and promoting willingness to support aid for Darfur via donation, petition, discussion, and forwarding messages (Peng, Lee & Heeter, 2010).

Playing civically themed games is thought to have a motivational effect, where players seek more information about the subject (Squire, 2004). In a study of four games intended to raise social awareness, Neys and Jansz (2010) reported that more than half of their participants reported feeling motivation to share and discuss the issues and games with friends. However, this research was not longitudinal and could not assess whether or not players followed through on their intentions.

The relationship between attitude change and further engagement with civic game content, including recommending the game via online sharing, may not be clear-cut. Although attitude change may occur, players' later responses to their civic gaming experiences seem to depend on poorly characterized factors. For example, Lavendar (2011) reported that individuals who played a computer game about the experiences of the homeless showed increased sympathy toward homeless people but generally did not regard the video game as a highly effective means of increasing awareness of the issue, and expressed no increased

interest in further engagement with the subject matter. Some participants in that study reported that the user interface itself was a factor in their perceptions of the game's quality, but the role of the rhetorical strengths of the game in their valuations is unclear. Newman (2012) found that attitudes towards the working poor in young adults (18-35) became more positive after playing a serious game intended to simulate everyday challenges faced by low-income individuals; however, participants in that study were reluctant to share the game using their Facebook pages, and again it is unclear why. It is plausible that participants' beliefs about how the social issue is perceived by their peers, or how the message would affect others in their networks, may influence their reluctance to act.

Attitude change as well as subsequent behavioral change in response to persuasive or educational messaging is known to be influenced by prior experiences, including perceptions of social norms, and beliefs about the relationship between one's personal actions and the outcomes targeted by a campaign (Ajzen, 1991). All of these influences may factor into the effectiveness of the game's message design. Furthermore, how much change results may also be influenced by players' gaming habits; for example, Waddington *et al.* (2014) examined changes in nuclear attitudes in response to playing a nuclear war-themed game, and found that prior gaming experience and attitude change were related to both the direction and the extent to which players' views were affected by playing the game. Waddington *et al.* suggested that prior gaming experience may have influenced how compelling and plausible players found the game's message. A further question to explore is how prior experiences of civic culture and civic expression may affect players' interpretations and responses to the game. Bennett (2008) argues that North American youth activists are often interested in civic participation via consumerist practice and the use of non-traditional mass media. However, they also may be more inclined to participate in the evaluation of information on which decisions about action are based, and may prefer information that is directly integrated with action options. Individuals with high and low levels of prior civic engagement may thus approach and interpret a social change game in quite different ways, but little research has been conducted in this area.

It is clear, however, that the credibility of a game is vital to achievement of the design goals of games for change; Cohen (2014) argues that the specific belief that sharing content from a social awareness campaign will effectively promote awareness is a stronger contributor to sharing behavior than the player's attitudes toward sharing content generally. Cohen's study of social sharing of the game *Darfur is Dying* supported this hypothesis; in that study, scores on a scale measuring confidence in one's ability to advocate for relief in Darfur were positively related to sharing messages or linking to the game via email or on social media both during a playtest session, and in the week after playing the game (Cohen, 2014). What is not known, however, is what factors the players are considering when judging the credibility of such games.

## Chapter 3—Conceptual Framework

In this chapter, I will first present some key concepts and assumptions that inform my approach to the study of *Get Water!* as a civic gaming experience. First, I revisit and expand on a theoretical framework for game-based learning drawn from the literature. Second, I discuss key concepts used to describe gaming experiences. Third, I present some educational validation concepts from the simulation and game-based learning literature that I believe are useful and complementary to the other parts of my framework, and finally, I present a brief summary of the guiding principles for my framework.

### Civic Game-based Learning

Raphael, Bachen, Baldwin-Philippi and McKee (2010) proposed one of the most useful frameworks for understanding how civic content is expressed in video games. In the article, "Games for Civic Learning: A Conceptual Framework and Agenda for Research and Design." Raphael *et al.* argue that civic games can be analyzed according to three "basic tensions": tight vs. loose integration of gameplay, ethical vs. expedient gameplay, and free/high-agency vs. highly structured gameplay. They contend that these design values influence how games with civic themes function as learning tools.

The first basic tension, *tight vs. loose* integration, is the degree to which gameplay (e.g., flying a helicopter) and the civic content of the game (e.g., helping people suffering from famine) are integrated. In a loosely integrated game, the central theme of the game is not closely tied to the gameplay—for example, Raphael *et al.* (2010) maintain that one can play *Food Force* (2005), a game in which one flies around in a helicopter delivering food, without understanding the theme of the game at all. As the authors point out, as one flies the helicopter while trying to drop the packages correctly, it is easy to forget that the game is about addressing world hunger. In other words, with loose integration, gameplay and content can become detached, which weakens the power of the civic content substantially.

The second tension, *ethical vs. expedient* gameplay, is concerned with the extent to which the player is expected to exercise ethical reasoning and reflect on the political and moral implications of in-game actions with respect to the social realities depicted in the game world.

Raphael *et al*. argue that in an ethically-focused game the reward structure, audio-visual elements, and the attributes and abilities of entities in a game are potential sources of feedback that might change based on the moral implications of the player's actions. In their view, games such as *Food Force* emphasize expediency over ethics in gameplay by directing players' attention such that they prioritize efficient achievement of the in-game goals over reasoning about how the characters or entities depicted *ought* to behave. Although such games may provide moral feedback, players are not required to attend to that feedback in order to continue in their roles.

The third tension, *agency vs. structure*, is the degree to which the player is empowered to alter the cultural, economic, political, and social structures of the game world as they play. Games that are high in agency allow players to change their role as a character or even the rules of the game as their choices transform the game world. Raphael *et al*. place *Food Force* at the highly-structured end of this continuum; the player's actions do not alter the rules governing the conditions of success in the game, and the mission objectives and roles the player can play are fixed.

An important component of the civic game-based learning framework is that the *ethics vs. expediency* and *structure vs. agency* dimensions create a design space in which games that primarily fall into one quadrant or another may most strongly express the values associated with different dominant identities or conceptualizations of citizenship. This variation may have major consequences for the suitability of certain game designs for certain kinds of content. Their model of citizenship identities is depicted in Figure 2.

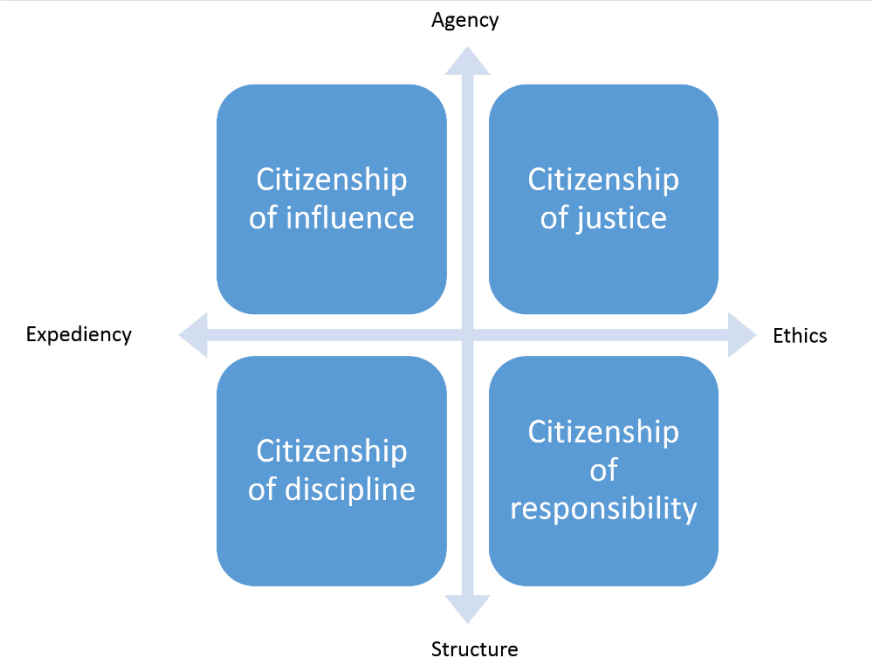



*Figure 2*. Types of Citizenship from Raphael *et al*. (2010*).* Adapted from "Games for Civic Learning: A Conceptual Framework and Agenda for Research and Design," by C. Raphael, C. Bachen, K. Lynn, J., Baldwin-Philippi, & K. A. Baldwin, 2010, *Games and Culture*, *5*(2), 199–235. Copyright 2010 by Sage Publications.

This typology may prove useful in understanding what players might learn from a particular game, what some players might expect from a game with civic content based on their own beliefs about participation in public affairs, and why they may ultimately reject a particular game.

**Limitations of Raphael *et. al***

Raphael *et. al* hypothesize that the rules, goals, and the role of the player are the most influential determinants of a game's potential for civic education because these elements are "more constitutive" of the gameplay experience, when compared to the non-procedural representational components of a game's design. Non-procedural components that they identify include: points of view; information and feedback on consequences in the gameworld; sound; settings; visual representations of the physical world of the game; and entities that the player manages, modifies or interacts with. It is unclear whether or not this hypothesis reflects

an assumption about which features will affect the efficiency of learning, or an assumption about what features game designers primarily use to communicate about social issues. Their conjecture is grounded in Bogost's (2007) argument that video games present arguments using verbal, visual and procedural rhetorics; where the ability to "read" and write arguments encoded as system operations depends on "procedural literacy". For the purposes of this research, I will not prioritize the procedural representational features. This conjecture seems technocentric in Papert's (1987) sense of the word and might lead a researcher to discount potentially important contextual factors that may affect how the player makes sense of the play experience. For example, it is not clear whether or not the player would be able to identify their character's role in society without referring to the visual and verbal content, especially given that procedural literacy may be relatively underdeveloped in players who do not frequently play video games. It seems especially inappropriate to discount the relevance of non-procedural representational content for games meant to enable a player to explore a different cultural context. In short, it is not self-evident that players themselves would find a strict separation between gameplay and content features in their experiences with a game product very meaningful, particularly if asked to comment on how they believe social structures and roles are represented in a particular game.

The Raphael *et al.* framework overall is very design-focused and does not offer much direction as to how players may understand and integrate features that carry a game's civic content or social message. I propose that it is more appropriate to support the argument for why a particular video game may be effective in fostering civic learning using task analyses that elaborate how the features of the game and content of interest are linked. In particular, I believe the mode of interaction ought to be part of the description of players' activities; this seems to be implicit in the "tight vs. loose" dimension of the Raphael model. *How* players are expected to interact with content-bearing features, and the quality of implementation, could substantially alter how content is interpreted (and whether or not it is interpreted at all). Civic content can be communicated in different ways: for example, the concept of "poverty" may be communicated through numerical values, through scenery, or dialogue with non-player characters. These modes of interaction may have quite different consequences for how the

player interprets the experience. Some key concepts from educational gaming experience models, presented next, will serve to fill in this gap.

**Describing Educational Game Experiences**

Numerous models of game experience have been proposed. Though there are some integrative frameworks for the description of game experience in the literature, such as those proposed by Kiili and Lainema, (2008), Poels *et al*. (2007) and IJsselsteijn *et al*., (2008). These draw on earlier theoretical works and empirical studies of game experience that focused on individual components, including:

- *challenge & flow,* involving concentration, a sense of challenge and fit between player skill and the demands of gameplay (Sweetser and Wyeth, 2005, Cowley, Charles, Black & Hickey, 2008);
- *immersion* in gameplay and in fantasy, involving affective and cognitive engagement with the narrative, characters and gameworld (McMahan, 2003; Ermi and Mayra, 2005);
- *player affect*, including positive feelings (e.g., arousal, enjoyment) and negative feelings (e.g., frustration, boredom) (Gilleade & Dix, 2004);
- *social presence*, involving one's sense of playing "with" others or involvement in a community (this pertains to both mediated or unmediated interactions with other players) (Gajadhar, de Kort, & IJsselsteijn, 2008); and
- *usability* of the interface, which can contribute to frustration and facilitate or inhibit players' access to in-game content (McDonald and Timonen, 2009).

These various components of the gaming experience are thought to predict players' engagement with video games on affective and cognitive levels. Extensions of the "gaming experience" models to the educational game experiences in particular, adding components related to effective communication and achievement of learning objectives within the game, including user experiences of:

- coherence and relevance of the frame story that situates learning (Kiili, 2005; Williams & Williams, 2007);
- clarity of learning goals (Kiili, 2005);

- perceived learning (Kiili, 2005); and
- cognitive load (Kiili, 2005 and De Grove, Van Looy, and Courtois, 2010).

The models of game experiences described above are focused on the immediate experience of the video game, however other researchers also consider the "meta-game" experience to be important to the development of players' idiosyncratic understanding of games--this part of the game experience involves all out-of-game interactions, such as discussing and sharing experiences with others either directly or indirectly through reading blogs, fan websites and so on (Gee, 2011). In the context of civic games-based learning, participation in meta-game discourse is actually a valued behavioural learning outcome, so it too is integrated into my theoretical framework.

These treatments of gaming experiences are helpful but still developing as models, and are intended to be generally applicable. As such, their descriptive capabilities may be somewhat limited in the pursuit of an in-depth account of how the player experiences the relevant content as it is realized within the game system.

**Educational Validation of Game-based Learning**

Within the literature evaluating games-based and other experiential learning experiences, this exploratory study is best understood as a study of the *representational validity* and *internal educational validity* of a game, because my aim is to investigate whether or not a simulated experience functions *as intended* as a representation of reality and whether or not it is understood *by the learner*, rather than to investigate whether or not the students' learning is retained or transferable elsewhere (Feinstein and Cannon, 2001). Feinstein and Cannon's (2001, 2002) prescriptive standards of evidence for effectiveness of educational simulations experiences include the highly flexible concepts of *fidelity*, *verifiability*, and *validity*. In their framework, high *fidelity* is indicated by realism in the simulation, high *verifiability* indicates that the game's model operates as intended by the designer, and *validity* is demonstrated when participants in a simulation game are shown to learn consistent and relevant information from the experience. Feinstein and Cannon further describe *representational validity* as a flexible construct that accommodates simulation designs ranging from very complex low-abstraction simulation experiences, to more conceptual or artistic

approaches to representing real-world phenomena. Within this framework, *symbolic representational validity* will be used to describe the player experience of identifying a psychological or metaphorical correspondence between the in-game representation and reality, while *functional representational validity* will be used to describe the player experience of identifying a correspondence between the functional relationships *between* elements of the in-game representation and the real-world relationships between real-world entities or objects that are represented within a game. I believe this vocabulary may prove useful in its application to verifying the educational usefulness of a particular learning experience structured by the rules, roles, goals, and other non-procedural representations contained within a digital civic game.

**Summary of the Framework**

The following propositions are researcher expectations that shaped the data collection plan and informed the analytical strategies I selected.

1. Social change games are civic games that present opportunities for informal civic education and may trigger player reflections on knowledge, skills, and attitudes relevant to participation in public affairs.
2. Players of social change games may come to understand their play experiences through interactions in-game, but may also draw on experiences of civic life to understand:
    a. in-game roles, rules and cultural representations; and
    b. their own roles as citizens using a tool intended to educate players about society.
3. A player's experience of a particular game may include interactions with the application interface, as well meta-game discourses.
4. Player interpretations of the game experience will shape players' evaluations of the game and its effectiveness as an awareness-raising tool.
5. Concepts for the educational validation of gaming experiences drawn from the simulation learning literature may offer appropriate concepts for the verification of civic game-based learning experiences.

## Chapter 4—Methodology

In this chapter I will present my chosen methodology, provide justification for the research design choices I've made, and describe the sample and procedure to be followed in my research. First, I will present my research objectives and propositions, then describe my methodological orientation and rationale, research design, data collection strategy, and analysis plan.

### Research Objectives

As previously stated, this investigation was meant to explore the following research questions:

1. How do players experience *Get Water*? That is, what do they perceive in the game, how do they interact with it, and ultimately, how do they respond to the experience?
2. How are players evaluating *Get Water*? That is, what expectations did they have, what information are they using to form their judgments, and how do they prioritize their valuations?
3. Is there evidence that playing *Get Water!* influences players' attitudes, thoughts or actions related to the social issues it addresses? If so, in what way(s)?

### Case Study Methodology

Case study methodologies are used to explore a phenomenon in context, using a variety of sources (Baxter & Jack, 2008). In particular, the case study approach is appropriate when the researcher is answering "how" and "why" questions; cannot manipulate the behavior of the participants; and when the researcher believes that the contextual conditions are considered relevant to the phenomenon or that the boundaries between context and phenomenon are not clear (Yin, 2009).

This is an instrumental case study, in that this case was selected with the purpose of identifying ways in which players may approach and evaluate games developed to support social causes. In this case, the central phenomenon investigated is players' experiences of playing a specific civically-themed casual digital game, where

- the phenomenon is explored in relation to effective design for a persuasive educational game, and
- the decision-making and thought processes of the players playing the game cannot be separated from their reactions to the game itself and the players' own experiences and dispositions.

This is also an embedded case study where the larger case is the game, and embedded case units are individual players. By selecting a variety of embedded cases, I will be able to make comparisons at the level of the individual player –examining a range of similar and contrasting cases can contribute to a more nuanced understanding of findings from single cases by clarifying how, where and why *that* finding was possible in the context of that case. In this way, examination of particular cases can "strengthen the precision, validity and stability of the findings" (Miles & Huberman, 1994, p.29).

**Data Collection Strategy**

The first three components of my data collection strategy are modeled on Barr, Noble & Biddle (2006): documentation of my experience playing the game, an audit of in-game representations and mechanics, examination of external data, observations and interviews. Additionally, players also completed questionnaires to facilitate triangulation.

***Researcher experience and audit of the game design.*** First, I personally played the game, taking extensive notes on the player experience and user interface. I conducted an audit of the game using Jarvinen's (2007) framework to describe the game's ludological structures, as well as the Raphael *et al*. framework, to identify the basic structure of potential player interaction in the game application. This audit strategy is intended to identify ways in which the player can interact with the game and the outcomes associated with those interactions. The results are reported in the section Get Water! – The game, in the Case Study chapter.

***External data.*** I collected data related to the game, including personal communications with the game designers, game design documents, the game's Facebook page, the game's official website, and articles in the popular press that discuss the game. Barr *et al*. (2006) suggest that examination of such documents is informative in that they may contain explicit

discussion of values in the game, as well as experiences that the research participants and I may not personally encounter while playing the game.

***Observation and interviews.*** Adults from the Montreal area were recruited to participate in a play session under observation, followed by a semi-structured interview. These participants and the procedure for the laboratory session are described in detail in the Participants and Procedure below.

***Questionnaires.*** Participants in the play session also completed questionnaires. These questionnaires will enable me to develop profiles of each participant that include basic demographic information, digital gameplay experience, and additional information about their experience of the game and its message. The questionnaires are described in greater detail in the Instruments section.

**Participants**

As part of a larger research initiative, a convenience sample of participants were recruited using recruitment tables in the lobby of the EV buildings on Concordia's Sir George Williams campus. Participants were asked to fill out a screening questionnaire (Appendix C) at the table if they were interested in participating in a study on "casual gaming". Although 22 people ultimately completed the study protocol, purposeful sampling was used to select a subgroup of these participants for in-depth analysis. This selection is based on the fit between their characteristics and the research questions:

- Teaching orientation or interest in enrichment with games (2 parents, 3 practicing educators, 1 teacher pursuing graduate education);
- Personal experience of the social issue or setting of the game (6 participants); and
- High and low perceived effectiveness ratings of the game with respect to its mission of raising public awareness.

The participants have been assigned pseudonyms, and will not be identified using their real names in any published product of this research. Their identities are known only to members of the research team authorized by Dr. Waddington.

**Procedure**

Participants completed 3 self-administered questionnaires; two during the laboratory session, and one online, at a time and place of their choosing.

The first questionnaire was completed on a laptop computer. This questionnaire provides contextual information and basic descriptive data about the sample, including their demographics, experience playing digital games on mobile devices, and civic engagement experience (Appendix D).

Participants then played the game *Get Water!* on an iPad provided by the researcher. Participants were informed that the researchers were not involved in creating the game, and were asked to think aloud as they explore the screens in the game and as they play. The participants were informed that they are permitted to click on anything in the game application that they wished—they could click on the built-in social media sharing options, or visit page and review content provided within the game as desired. Neutral prompts such as "Keep talking," or, "What are you doing now?" were used to encourage the player to share their observations aloud. The facilitation script is included as Appendix E. The think-aloud procedure is audio-recorded using a hands-free table-top microphone. The researcher was seated beside the participant, recording participant's activities with an observation form.

Immediately following gameplay, participants complete a post-play questionnaire administered using a laptop computer. This questionnaire recorded self-reported engagement with the game using the In-game Experience Questionnaire (iGEQ), developed by Ijsselsteign, de Kort, & Poels (2008) and also asked participants to:

(1) state the social message of the game,
(2) state the social message of quotes presented as game content,
(3) rate how interesting the quotes were,
(4) rate the effectiveness of the game as a tool to promote awareness of
    a. water scarcity, and
    b. the relationship between water scarcity and girls' access to education.

When the questionnaire was complete, a semi-structured interview was conducted using the interview guide (Appendix H). To minimize demand characteristics, the interview was conducted after the post-play questionnaires. Participants had access to the iPad, with the game still open, to facilitate demonstration and discussion of in-game interface elements.

Four weeks after completing the laboratory session, participants were invited to complete a follow-up questionnaire within a 1-week period using Fluidsurveys' automated email invitation system (Appendix I).

**Instruments**

***Observation sheets.*** The goal of this activity was to document which parts of the interface the player interacts with, note how much time they spend reading materials presented in the game, and any other behaviors of interest.

***Index of Civic and Political Engagement.*** To assess participants' level of civic engagement and participation in expressions of "public voice", I selected the index of civic and political engagement developed by the Center for Information & Research on Civic Learning & Engagement (2006). It includes items indicating levels of participation in a variety of civic activities, such as community service and participation in charitable events, as well as indicators of political voice, such as signing petitions or contacting public officials. The items of this index are included as Appendix D, Part III.

***In-Game Experience Questionnaire.*** To characterize participants' immediate experiences of the game, I selected a brief questionnaire published by IJsselsteijn, de Kort, and Poels, (2006) that elicits self-reports on level of enjoyment, experiences of flow and immersion, challenge, and positive and negative emotion.

***Additional Questionnaire Items.*** Additional questionnaire items were constructed and reviewed for comprehensibility by 15 peers. These items, included in Appendices D, G, and I, target:

- participants' past play experiences, particularly with regards to genre preferences and access to smartphones and tablet devices;

- participants' identification of the social messages in the game; and
- participants' activities related to the game post-play (e.g., discussing and downloading the game).

A number of instruments are included in the data collection strategy. The rationale for each component is summarized in Table 2.

Table 2.

*Rationale for quantitative and qualitative data sources*

| | **Quantitative** | **Qualitative** |
|---|---|---|
| **Participant self-report** | • Level of engagement with the game (iGEQ)<br>• Level of civic engagement (CIRCLE Civic Engagement assessment)<br>• Engagement with and perceived quality of the game (Likert-like items) | • Insights on the game and social issue reported during and after playing the game<br>• Sharing and information-seeking motivations |
| **Researcher observations** | • Play log – time spent viewing game content related to the social message | • How the player interacts with the interface<br>• Commonalities, conflicts and contradictions in player comments |

**Analytical Strategy**

All textual documentation (e.g., audio transcripts, documents) was analyzed using HyperRESEARCH, a software program for qualitative data analysis. Descriptive statistics for the self-report scales were produced using Microsoft Excel.

Verbatim transcripts from the think-aloud sessions, semi-structured interviews, questionnaire data and researcher observations for each participant were examined first to produce detailed description of the experiences of each of the selected participants, and then examined in aggregate to identify common themes across participants.

Verbal data was analyzed and synthesized following the content analysis process provided by Berg (2004), where data is grouped into both analytic and grounded categories, and analyzed for the presence of common themes that are both described and quantified, to demonstrate the magnitude of the strength of these patterns. Elements of Strauss and Corbin's grounded theory methodology were applied to describe and group factors that may affect the perceived value of this video game in promotion of its social cause. Descriptive vignettes were developed to illustrate how the players' interactions and commentary were linked.

**Protecting Data from Unauthorized Access**

To ensure that my data was protected from unauthorized access, all files pertaining to the participants, including audio recordings, observational data and transcripts have been stored on a password-protected secure server hosted by the Department of Education. The questionnaire data collected via Fluidsurvey’s web-based survey tools are accessible to members of the research team and are also password-protected. All data will be accessible only by myself and researchers authorized by Dr. David Waddington.

**Ensuring the Credibility and Trustworthiness of the Results**

To ensure the trustworthiness of my data, I will employ thick description to situate my interpretations with two major aims, as recommended by Tracy (2010): (1) to communicate the complexity of the situation being studied and enable readers to draw their own conclusions about the phenomenon and (2) to facilitate access to tacit knowledge and explore participants' unspoken assumptions.

Triangulation will be achieved through the use of multiple sources of data, including both unstructured commentary and structured data collection approaches, detailed self-reflexive documentation of decisions made during data collection and analysis, and through the use of multiple theoretical frameworks to examine the game, the players, and their interactions with the game and real-world issues.

To ensure rigor, the questionnaires and interview protocol were reviewed by Drs. Waddington and Venkatesh, then pilot-tested with 5 participants, to verify that the questions could be understood easily.

To ensure credibility of the data, a prebriefing script was followed to ensure that participants were consistently reminded that their authentic experiences of the game are valued, that their participation is confidential and their real names would not be disclosed. Participants were also reminded that this research is not being conducted on behalf of the company that created the game and that the study's success relies on the honest disclosure of their thoughts and feelings. Additionally, both unprompted and prompted comments were collected for all participants; the think-aloud protocol enabled me to gain some insight into the participants' spontaneous assessments of the play experience, which could then be compared and contrasted with participants' prompted self-reports provided in the questionnaires and semi-structured interview. Four participants responded to follow-up emails and gave feedback on my interpretations.

## Chapter 5—The Case Study

### *Get Water!* —The Game

The videogame employed in this study, *Get Water!*, is a mobile game developed for iOS devices, published in 2013 by Decode Global. In this chapter I will describe the context of the game's development, provide an overview of the game's features, and finally, describe the game's civic content using the framework for game-based civic learning proposed by Raphael, Bachen, Baldwin-Philippi and McKee (2010).

### Development Context

According to the Decode Global website, "*Get Water!* is an endless runner meant to raise awareness about global water scarcity and its effect on girls' access to education. The intention of Decode Global is present a serious issue in an accessible way, and to maintain an optimistic tone. The game itself is therefore simple and fun, but is meant to spread awareness and to be used as point of engagement for further learning in an educational context" (Decode Global, 2014). The game was developed by a team of student interns within a fellowship program, the result of a collaboration between Decode Global and the Hexagram Institute at Concordia University, Montreal (Angelique Mannella, personal communication, December 11, 2012). The team was advised by Angelique Mannella, founder and CEO of Decode Global, who agreed to provide her insights into the design process, and authorized the team's embedded ethnographer, Renee Jackson, to review and comment on my findings. It is important to note that the purpose of this investigation was not aligned with the aims of the company and fellowship program; the Civic Gaming team aimed to investigate the educational validity of the game as experienced by adult consumers. In contrast, the fellowship program was intended to provide a professionalizing experience for its participants, who had little experience working in the digital game development industry--the game concept was developed by student interns, and the prototype was then polished by professionals for release to the public (Renee Jackson, personal communication, February 10, 2015).

At the time this study was conducted, the game was optimized for iPad and available for free only for iOS (it has since been released for Android devices as well). It was released on 22

March 2013, on World Water Day, an event coordinated by United Nations Educational, Scientific and Cultural Organization's as part of its "International Year of Water Cooperation" initiative (UNESCO, 2013). *Get Water!* was originally released for a general audience. At the time when this study was conducted, version 1.1 of the game had been submitted to iTunes both in the education category, and in the general games category. The initial intent to market to a general audience is reflected in the interface design for version 1.1, which included social network integration with Facebook and Twitter—these services are not meant to be used by individuals under 13 years of age (Renee Jackson, personal communication, February 20, 2015). The game was revised and resubmitted as a game for children later in 2013. Since the game was rereleased as an Educational game, certain features have been removed from *Get Water!* to ensure that the game meets the requirements set by the iTunes Store and Google Play Store that ensure the game is safe for children to play unsupervised; notably, in-game donations and social network integration have been removed (Angelique Mannella, personal communication, February 18, 2015).

Due to these and other design changes implemented as the game matured, the observations and analyses presented in this thesis may have limited applicability to later releases of *Get Water!.* The applicability of the findings of this study to the present version will be explored in the discussion of the case study.

**Gameplay**

The player's task is to guide the character Maya, a young Indian girl, through a 2D obstacle course collecting water droplets and other resources (such as mangoes) for as long possible without breaking her water pot. Obstacles such as peacocks, turtles, and stray balls break Maya's pot, forcing her to run back to school to begin her journey again. Figure 3, below, shows Maya running along the path drawn by a player.


*Figure 3.* A screenshot from *Get Water!* version 1.1 (Decode Global, 2013).

*Get Water!* was promoted as an endless runner game appropriate for players aged 4+, according to its Apple App Store description (Decode Global, 2013). Popular games in the endless running genre include *Temple Run, Subway Surfers,* and *Sonic Dash*. According to Flurry Analytics' analysis of the top 200 iOS games, in March 2013 the audience for this genre was just under 60% female and the average player fell in the 20-25 age group (Laughlin, 2013). The Flurry report suggests that endless runner games can be grouped with other games that are easily learnt, where play is relatively infrequent but retention is very high. These games are typically played quickly while in a "wait state", such as waiting in line or taking transportation. *Get Water!* conforms to many conventions of this platformer subgenre in its design; its graphics are cartoonish and accompanied by upbeat music as the player character runs continuously forward through a procedurally generated landscape. The controls are simple, enabling the character to collect items by running through them, jump, use a weapon, and activate equipment.

*Get Water!* differed from other endless runners at the time in three ways: (1) it integrated a social message; (2) the player character's movement was controlled using a novel "swiping", or gesture-based input method, rather than on-screen buttons; and (3) the **game**

included a story-based reward system. When target amounts of water are collected, animated storylets are unlocked which show Maya acquiring new skills that enable her to collect water more efficiently.

**Overview of the Game System**

Using Jarvinen's (2007) framework to describe game's ludological structures, Table 3, below, describes *Get Water!* as a game system, including characters, items, and information available to the player.

Table 3.

*Ludological description of Get Water!*

| | | |
|---|---|---|
| Characters | Maya (playable character): young female girl in India | |
| | Non-player characters: Maya's mother, teacher, friends, other students | |
| Objects to be purchased | Objects that enhance abilities | scary mask (enhances obstacle avoidance); jumping skill; water magnet; enhanced boomerang |
| | Objects that reduce penalties from obstacles | purification tablet; water filter; impact-resistance water pot upgrade |
| | Objects that increase points resulting from object collection | Mango muncher; Larger water droplets |
| | Donations | |
| Places | School (not playable) - represents going to school or learning new skills | |
| | Village - represents a place where water scarcity and gender inequality exists | |
| Maya's abilities | Boomerang throwing (deters peacocks) | |
| | Collecting water and fruit | |
| | Jumping | |
| | Running on blue line (includes running mid-air) | |
| Maya's limitations | Breaks water pot on impact with peacock, turtle, ball | |
| | Can't deter turtles with boomerang | |
| | Collecting contaminated water causes damage | |
| Global variables | Amount of water Maya needs (known to player) | |
| | Amount of water droplets available in the environment | |
| | Number of fixed obstacles (turtles, bad water) | |
| | Number of moving obstacles (peacocks, bouncing balls) | |
| Rule-set | Defeat condition: broken pot | |
| | Success: unlocking story chapters; unlocked skills; points | |
| Main game mechanics: | Collection | |
| | Obstacle avoidance | |
| | Throwing projectiles | |
| | Upgrading player characterr | |

The game application as a whole includes numerous design elements that bear the message of the game, and that may promote information-seeking and participation in support of the game's cause; participatory opportunities include online sharing, presentation of user-generated content supporting the game, and prompts to share player activity and quotes about water scarcity to Twitter and Facebook.

Key message-bearing components of the design that were present for its initial release in the iTunes store are summarized in the Figure 4, below.

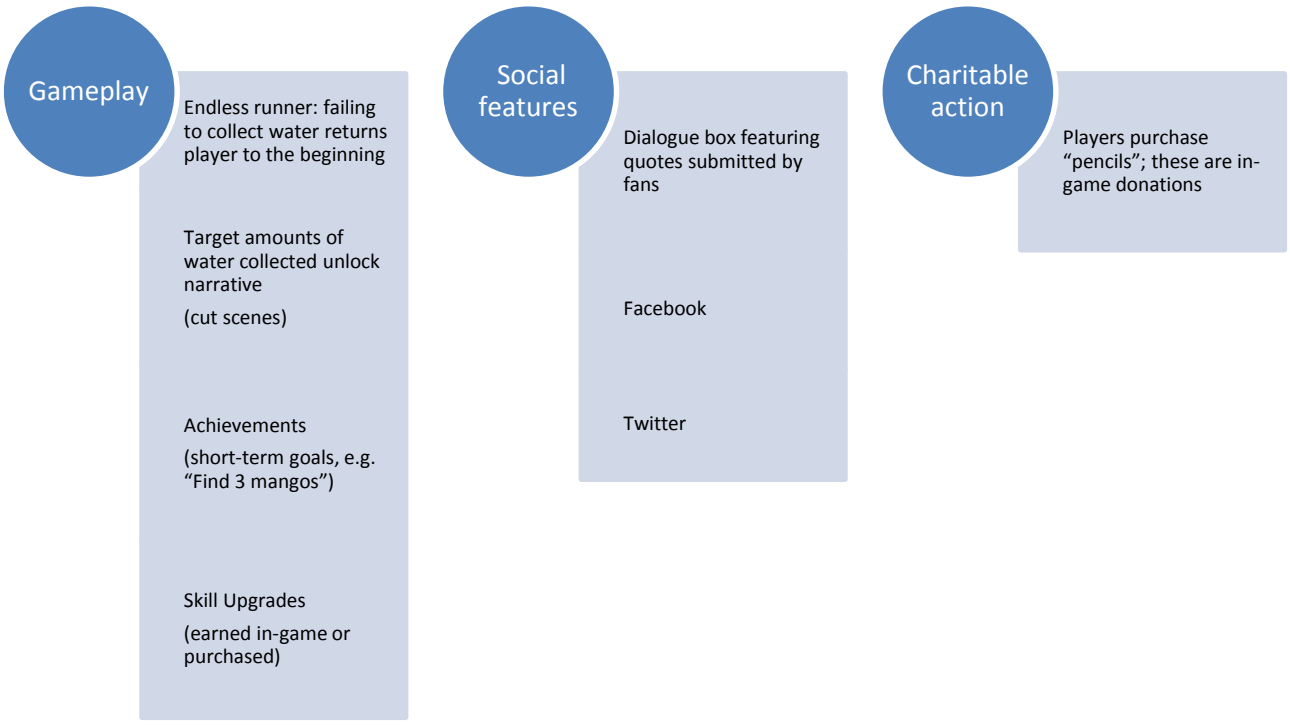



*Figure 4*. Features of *Get Water!* relevant to the game's civic messaging.

**Civic Content**

The core content learning objective in *Get Water!* in its initial conception was to teach players that there is a relationship between access to clean water and girls' access to education (A. Mannella, personal communication, December 11, 2012). The game also addresses certain social learning goals in the form of affective and behavioral objectives. In the affective domain,

the game promotes certain social values, and facilitates the expression of support for social values such as equity in education and universal access to education. In terms of behavioral outcomes, the game promotes participation in discussion about the issue, and promoting information-seeking after playing the game.

The game does not explicitly incorporate much information about the water scarcity issue; notably, the game scenario is communicated nonverbally, using short animated sequences. A summary of the cutscene content present in version 1.0 of *Get Water!* is included as Appendix M—Cutscene content.

Within the civic game framework proposed by Raphael *et al*. (2010), *Get Water!* is best categorized as a loosely integrated game, where the civic content is not closely coupled to the gameplay; one can successfully complete the game *Get Water!* without understanding its theme. Some of the rules, roles and goals set out for the player are clearly relevant to the theme of water scarcity and education. For example, in the introductory scene that opens the game, a large city with skyscrapers is juxtaposed with a village of small buildings. Maya's character is then withdrawn from school by her mother because the water pump has broken. During gameplay, meeting certain water collection goals unlocks the story progression wherein Maya learns new skills from her teacher, her mother, and her friends. She gains new abilities and acquires equipment such as water purification tablets that allow her to collect contaminated water without losing points. In contrast, other gameplay elements do not address the theme; for example, the in-game achievements include "scare away three peacocks" and "use the mango muncher skill," which encourage players to explore different ways of acting in the game system, but are not relevant to the civic theme.

In Raphael et. al's framework, *Get Water!* is best characterized as a game that favors *expediency* over *ethics*. That is, success in the gameplay does not actually require the player to reflect on the social realities depicted in the game world. One can successfully follow the game's rules, achieve its goals and play Maya's role without ever considering what value those actions may have ethically. Raphael *et al*. point to a game's reward structure, sounds, visual elements, and the attributes and abilities of in-game entities as potential sources of feedback

that, in an ethically-focused game, might change based on the moral implications of the player's actions. Feedback of this kind is extremely limited in *Get Water!*, but then, there are very few failure conditions in the game: one can lose points by collecting contaminated water, or one can break the water pot by failing to deter a peacock, or by failing to avoid a turtle or bouncing ball. The only apparent consequences of Maya's failure are experienced by the player: failure to gain points delays the opportunity to buy upgrades, and also delays progress through the animated cutscenes. Failure to gather sufficient water does not appear to have any consequences for Maya (aside from missing more school). The opportunities for ethical feedback within the restrictions of this game's structures are limited in part by the lack of interaction with other characters, and this restriction is closely related to *Get Water!*'s position on the structure vs. agency dimension in Raphael *et al*.'s conceptual framework. The player's decisions have no effect on the institutional structures and social dynamics of Maya's world, and also have no effect on the direction of the fictional narrative of the game. Therefore, I was interested in learning whether or not the players would find Maya's scenario compelling or believable, given Maya's motivations and constraints have limited representation. I also wondered whether or not the players would be cognizant of Maya's agency within her cultural context.

Raphael *et al*. argue that there is a distinction between civic training and civic education, and different games will be better suited to one type of learning or the other. Civic training offers nonreflexive learning opportunities, introducing concepts and skills with the potential to empower the individual to participate effectively within the social system, but without encouraging the learner to question the structure of that system. In contrast, civic education is intended to develop civic leadership competencies, and encourages "authentic reflection on whether the aspects of that system are best for the self or society" (Raphael *et al*., 2010, p. 218). Based on gameplay alone, *Get Water!*'s combination of expediency and structure would be predicted to be best suited for *civic training* applications, training players for non-leadership civic roles – these games are not expected to elicit as much critical thinking as games in which ethics and agency are emphasized, and are therefore less are expected to be less suitable for transformative *civic education* with games. The loose integration of content and game

mechanics are also expected to be problematic for civic learning within this framework. However, when one considers the design of the application as a whole, it can be argued that the game communicates an ethical system; it simply does so almost exclusively through "game content" features rather than the mechanics. This game presents an interesting challenge for the application of Raphael *et al*.'s framework; although it does not do much to prompt reflection on motivations for the consequences of in-game actions, the design seems to nonetheless promote reflection on the players' motivations for playing the game, and their support for its social cause.

This can be seen in the way the game presents information outside the space of gameplay, both elsewhere in the application, and in meta-game content (i.e., the company's Facebook, Twitter, promotional materials and in media content produced by third parties). Although the game does not present as much information as it might about the water scarcity issue, it frequently presents prosocial messaging within the game application. When player fails during *Get Water!*, direct messaging promoting support for universal access to water and education is presented in the form of user-submitted messages. The development team invited early fans of their Facebook page and participants in face-to-face promotional activities to submit quotes expressing support for the game's cause that were then integrated into the initial release of the game, and other user-submitted comments have been integrated into the game since (R. Jackson, personal communication, May 21, 2013). Potential contributors were given the following prompts and asked to complete the sentence: "I support universal access to education because…" or "I support universal access to clean water because…" Many quotes were gathered from students at a Montreal-area high school, and a number of submissions came from students whose teachers were members of the iEARN organization—Ed Gragert, Director of Global Campaign for Education, posted a call to the iEARN Teachers Forum requesting quotes from students responses to those prompts, promising that these would "pop up in the game when it's played worldwide" (R. Jackson, personal communication, June 1, 2014).

Table 4, below, includes a list of sample quotes that appeared in the game with the names, locations and ages of the respondents (the names and ages of the authors have been

omitted). The direct messaging may serve as reflection prompts that reinforce normative beliefs and values, but, like the limited knowledge content present in the game, these messages do not provide additional context for the social issue as presented in the game and do not explicitly encourage the player to reflect on his or her role in responding to the water crisis as an active citizen.

Table 4.

*A selection of quotes featured in the first release of Get Water! (March 2013)*

| **Content themes** | **Quote** |
|---|---|
| Access to education, social equality | "I support universal access education because education should not be related to money or power." |
| Access to education, social equality | "I support universal access to education because everyone deserves the right to be educated to reach their full potential." |
| Access to education, gender inequality | "I support universal access to education because it will enable and empower girls who otherwise might not get the chance." |
| Access to water | "Support universal access to clean water because water is the world's most precious commodity." |
| Access to water, social equality | "I support universal access to clean water because water is a basic need, and it's a shame that there's a common belief that only people who have money can or should have access to water." |
| Access to water, social equality | "I support universal access to clean water because water is essential to life and everyone deserves a healthy life." |

Consideration of the application's features as a whole suggest that, despite low integration of objective information, the overall product offered by *Get Water!* is still a civic gaming experience in the sense that the design models various civic competencies and values, and facilitates participation. The game's assumed ethical system is evident in various places; in the App Store description, the player is encouraged to "Help Maya!," and text in the in-game shop encouraged the player to "Help girls like Maya go to school". The direct messaging from

respondents between runs in the game reinforces a set of social norms, including values such as equity and social justice; player submissions in support of the social cause are presented as models for defending one's beliefs and exercising political voice. The application's design concept also affords a limited selection of opportunities for the player to exercise *agency* by way of expression of political voice—facilitating sharing about the game via Twitter, a link facilitating participation in conversation via its Facebook page, and finally facilitation of activism through collecting direct donations. In this way, ethics and agency are not manifest in the gameplay, but *are* evident in interactive features of the game application, and in other metagame discourses such as those present in the App store description. In fact, *ethics* and *agency* are emphasized quite strongly in discourses around the game, although they are not abstracted into the gameplay itself. Therefore, there is a potential conflict between values expressed in gameplay discourses and metagame discourses. The player is encouraged to act on the ethics expressed throughout the experience, and is provided with tools to facilitate that action. As such, the game application and metagame content serve as a persuasive technological system, and not simply a game (Fogg, 2002). This complexity raises two questions regarding the player experience (1) do the players view the game as a persuasive tool, or an educational tool; and (2) how do they distinguish between the two, if at all?

Raphael *et al*. predict that games of responsibility and justice will increase players' motivation to learn *more* than games of discipline and influence, because these identities tend to promote critical consideration of the effects of participation in political action on individual ethics and on institutional legitimacy, respectively. In the case of *Get Water!, expediency* and *ethics* may compete for prominence in the player's gaming experience depending on the player's attention to the gameplay, game content, and metagame design elements. A similar tension may arise in terms of *structure* and *agency*. Raphael *et al*. suggest that game designers explore how to incorporate civic content into metagame discourses, but do not make specific recommendations about how metagame discourse can be used to enhance the civic gaming experience, nor do they discuss how players might resolve tensions between metagame discourses and gameplay discourses. Therefore, how players negotiate tensions between these content streams is of great interest in this investigation.

## The Player Study

The findings from the player cases will be structured as follows: first, I will present a brief description of the makeup of our sample. Second, I will present summaries of player interactions and responses to the game at the group level. Third, I will present player vignettes that provide a detailed account of how players with various perspectives interacted with and commented on *Get Water!.* Finally, I will present an account of emergent themes identified in the study.

### Participants

The participants in the initial convenience sample of adult participants (n=22, 7 women) ranged in age from 20 to 42 (mean = 26.3), and all reported having played some form of video game in the past year.

***Educational and cultural experience.*** All of the participants were university-educated. The educational backgrounds of the 22 participants are summarized in Appendix N— Educational profile of the sample. Not all participants reported their areas of employment; of those who did, 6 participants worked as educators, 1 in university administration, and 3 worked in media production.

A large proportion of our participants (13) reported having some significant personal international experience, either having emigrated from another country, or having worked or studied abroad. Countries of origin included Canada (12), Ireland (1), India (4), Morocco (1), Romania (1), Germany (1) and Indonesia (1). 6 participants reported having lived in a region where water scarcity exists today.

***Gaming habits.*** We considered participants who reported playing games several times per week or almost every day to be high-frequency players; of the 11 high-frequency players, 5 reported playing 10 or more hours per week (range (2,42), median = 8 hours). Among the high-frequency players, the majority (8) reported having played games in both casual and non-casual genres in the past year, 2 reported only have played casual games (e.g., casual adventure games), and 1 reported playing only having played games in "non-casual" categories (e.g., first-person shooters). Ten players in the sample reported having played games in the endless

runner genre in the past year. A summary of the reported gaming habits in this sample is included as Appendix O—Gaming profile of the sample.

**Civic Experience**

Civic engagement was assessed using the civic behavior and political voice indices of the Civic Engagement Quiz, a survey instrument developed by the Center for Information & Research on Civic Learning & Engagement (2006). The survey's multiple-choice format also allows participants to report having participated in an activity more than 12 months in the past; this option was included to minimize over-reporting due to social desirability bias. Because my intent is to characterize participants' past civic experiences more broadly, any past participation was deemed relevant for this study. Consequently, both recent participation and lifetime participation are reported here. Lifetime participation was computed by allocating 1 point to responses in "Yes, in the past 12 months" and "Yes, but not in the past 12 months" response categories.

***Civic behaviour.*** The civic behaviour index assessed participation in community problem-solving, regular volunteering for a non-electoral organization, active membership in a group or organization, and participation in fundraising activities. A profile of the sample in terms of civic behaviour and political voice activity is included as Appendix P. According to the CIRCLE (2006), if a respondent reports having participated in two or more activities in the past year, they are considered 'engaged'. In our sample, half (11) of the participants were engaged in civic behaviours in the past 12 months. All participants reported having participated in at least one civic behaviour in the past.

***Political voice.*** The indicators of political voice assessed were consumer activism, signing written petitions, signing email petitions, contacting public officials, contacting the print media, protesting, and canvassing. We surmised that prior experiences in exercise of political voice would be highly relevant to players' reception of games about social causes, as individuals who have exercised political voice in the past may be interested in gaming in support of social causes as well.

Table 5.

*The top five reported public voice activities (lifetime participation).*

| Civic Engagement Quiz item | n | Percentage |
|---|---|---|
| Have you ever taken part in a protest, march, or demonstration? | 14 | 63.6% |
| Have you ever signed an e-mail petition about a social or political issue? | 13 | 59.1% |
| Have you ever signed a written petition about a political or social issue? | 14 | 63.6% |
| Have you bought something because you like the social or political values of the company that produces or provides it?" | 12 | 54.5% |
| Have you ever NOT bought something from a certain company because you disagree with the social or political values of the company that produces it? | 13 | 59.1% |

**Exploration of the *Get Water!* Application**

An observation checklist was used to document player interactions with the interface, with the goal of identifying interactions that might influence first-time players' perceptions of the game. Specifically, players' clicks in the App Store and on the game's Home screen were recorded. A summary of the screens and content actually visited by the players (excluding the "Play" screen) is included as Table 5.

After learning the aims of the study during the screening procedure, two participants downloaded the game to their personal mobile devices and played it prior to the playtest session. These two participants were both male casual game players who play video games several times per week. Unsurprisingly, neither participant explored the interface during the playtest session, and one read the "Reviews" tab in the App store. Neither reported having clicked the Facebook or Twitter icons.

Table 6.

*Exploration of the Get Water! application.*

| Interface element | Number of cases | % of cases |
|---|---|---|
| *App store* | | |
| *Details* tab | 12 | 60 |
| *Reviews and Ratings* tab | 9 | 45 |
| *Related* tab | 0 | 0 |
| *Facebook icon* | 1 | 5 |
| *Twitter icon* | 0 | 0 |
| *? icon (Tutorial)* | 1 | 5 |
| *Gear icon (Settings)* | 4 | 20 |
| Sound on/off | 0 | 0 |
| Music on/off | 1 | 5 |
| About | 3 | 15 |
| *Pencil icon (Store)* | 11 | 55 |
| *Story* | 10 | 50 |
| *Gradebook icon (Assignments)* | 9 | 45 |
| **observations for the 2 players who had played the game previously were omitted.* | | |

That the majority of players "opted out" of reading the apps store and exploring the application interface lends some support for Raphael *et al*.'s argument that more "structure" in how the content is integrated into the design would likely benefit players. 7 players (nearly 1/3) immediately launched the game without appearing to read or click anything in the app store, which may have contributed somewhat to confusion amongst players as to what Maya's goal was (to be able to attend school), as well as confusion as to where Maya's story was taking place. Players who were familiar with the region represented in the game made educated guesses as to the locations—recognizing the script on a sign in a window, for example. However, a number of players were not exactly sure where the game was set—potential

locations included Peru and Mexico, as well as the “Middle East,” Bangladesh, Pakistan or India. The setting was only explicitly identified in the App Store at the time, and for a few players, their inability to identify the setting was worrisome (see Candace’s vignette).

The mission statement was also not “required” viewing, although it seemed to make an impression on the few (3) players who independently located it in the Settings Menu, who all basically restated the game’s mission statement as the “social message of the game” in the post-play questionnaire. The placement of mission statement in the settings menu was also not ideal—two people noted that there was a settings menu aloud, but then did not explore the menu—both said they would not have thought to look there for information, ordinarily, and suggested that it would be acceptable to them for the mission statement to be incorporated explicitly elsewhere in the application, perhaps at the beginning of a cutscene. Only half of the players seemed to explore the application at all, though this may be attributable in part to their knowledge that there was a time limit to the play session. The participants had been informed that they would be able to download a copy of the game for free if desired, but the time limit may still have kept some participants focused on playing the game as much as they could. The most popular features that players interacted with were the app store (12), rating and reviews in the store (9), the in-game store where equipment could be purchased (11) and the "assignments" screen (9).

**Game Experiences**

Overall “experience” ratings obtained using the In-Game Experience Questionnaire are depicted in Figure 5, below. Histograms for the individual components are included as Appendix P—iGEQ subscale dimensions.

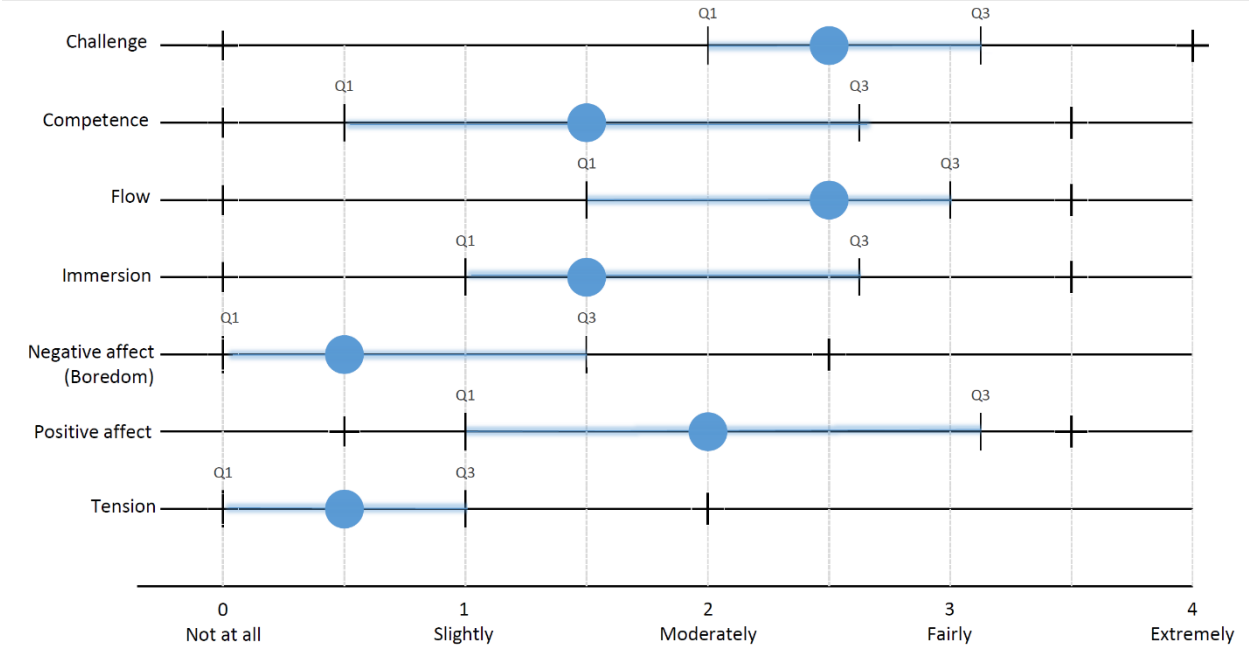



*Figure 5.* iGEQ subscales: Median, first and third quartiles, and range.

The internal consistency was estimated using Cronbach's alpha for each component--challenge (α=.90), competence (α=0.78), flow (α=.81), immersion (α=.83), positive affect (α=.82), negative affect (α=.64), and tension (α=.10). These values were generally acceptable for describing these dimensions of experience with the exception of *tension.* Each scale dimension is an average of responses for two items.

Overall, the experience was rated as moderately positive and only a minority (3) found it boring or tiresome (although the spread of scores was much greater on this dimension than the others). Most participants reported that the game was moderately or fairly challenging, and most did not report high levels of competence, which suggests that the game was not as easy to play as its casual categorization might suggest. Players comments suggest that the novel means of controlling the character's movement (drawing her path on the screen) may explain this. One player commented that it was "harder than I thought it would be […] I didn't know that I had to keep my hand on the screen while playing, so it was a little bit more difficult" and "you have to swipe really precisely otherwise you won't really move." A number of players did not initially realize that you had to swipe *below* Maya's feet for her to start running.

*Tension* was measured using the items "I felt irritable" and "I felt frustrated"—it seems that for this sample, those two statements were not interpreted to mean the same thing, and outlier removal was inappropriate for this descriptive application of the scale. Most responses were clustered towards the lower end of the scale, indicating moderate to low ratings for the two items. There were two extreme respondents: one was "extremely" frustrated but not at all irritable, while the other reported feeling "fairly" irritable but not at all frustrated. The "extremely" frustrated player died more frequently than the other players because she was initially playing very well, and the game increased in difficulty, presenting obstacles more and more frequently. She said in the interview that she enjoyed the play experience. The "fairly" irritable respondent also responded that he found the experience "extremely" tiresome, and his interview data suggests that he was quite dissatisfied by the experience—this player, Rory, was profiled in the "Naysayer" vignette.

The game seemed to promote a moderate sense of "flow" and immersion in gameplay, which suggests that players felt involved during gameplay. Of particular interest for this research, given how much of the civic content was communicated through the game's framing story and the cutscenes, was the *immersion* dimension, which is intended to measure a player's engagement with the fictional world or narrative. Half of the participants' scores on this dimension were in the range 0-1.5, suggesting that the story was not very interesting.

**Engagement with the Quotes**

A set of 4 "Quote engagement" items were constructed to provide a sense of how much players were attending to and interested in the quotes. Because the quotes were presented at the same time as an animated "water meter" providing feedback on water collection progress, I anticipated that at least some people might have not attended to the quotes. The internal consistency of the scale was good ($\alpha$=.81). The median summed score for "Quote engagement" was 10 out of 14 (interquartile range 8--12) suggesting that most respondents were rating the quote items relatively positively. However, written and verbal statements of the quotes' social message seem to contradict the self-reports, to the extent that many players refer to content that does not seem to correspond to the quote texts.

Key ideas reported for the quotes included the following: women and girls face challenges(2), empowerment for women and girls (1), support water and education for girls (2), universal education (2), “kids should not have to work” (1), “social and environmental awareness” (1), save water (3), "dirty water is harmful" (1), water conservation/quality (2), water is precious/important (2), “Clean water for all” (1), and "We face lots of problem in getting clean water" (1). Three of the people who said they “agreed” that the quotes interested them provided responses that seem to suggest that they did not retain the messages in the quotes, even if they did read them—for example, “kids should not have to work” seems to be an unlikely extrapolation from the presented messages.

Communicating the message

Figure 6, below, shows the parts of the game that the participants said especially supported the message of the game. Further discussion of the values the participants may have been expressing in their comments about how *Get Water!* communicated are included in the player vignettes.

| | Description | Number of cases |
|---|---|---|
| Mechanics | Core mechanic (collection) | 8 |
| | Core mechanic (collection)--experiencing tedium | 2 |
| | Obstacle avoidance (bad water)--realistic | 4 |
| | Obstacle avoidance--water is precious | 2 |
| | Obstacle avoidance--overcoming hurdles | 4 |
| | Questing--Assignments | 1 |
| Fiction | Cutscene 1(Intro)--Roles | 5 |
| | Cutscene 1 (Intro)--Narrative | 4 |
| | Cutscenes (not specified) | 4 |
| | Cutscene 1 (Emotion) | 1 |
| | Cutscene 1 (Intro) | 1 |
| | Cutscene 1 (Intro)--Setting | 1 |
| | Cutscenes (not specified)--nonverbal communication | 3 |
| | Scenery (source not specified) | 2 |
| | Overall narrative | 3 |
| | Rules--relationship between water and education | 1 |
| Feedback | Auditory feedback | 2 |
| | Water meter | 2 |
| Other content | Quotes | 12 |
| | Home screen visual design | 1 |
| | App Store description | 1 |
| Other activity | Buying Pencils | 2 |

*Figure 6.* Features of the game that participants said best supported the game's message.

**Salient social messaging**

***Water.*** Nearly all of the participants (21**, 95%**) mentioned access to water or *water scarcity* when describing the game and its social message. Another strongly represented civic content theme was *water conservation* or responsible water use (10**, 45.5%**)—this was surprising because water conservation was not addressed in the explicit messaging in version 1.1 of the game, although such messaging has been added to subsequent versions. It seems

that participants extrapolated from the content they saw, and so attached a related but non-target issue to the purpose of this game.

***Developing countries.*** Ten participants (45.5%) noted that water scarcity is an issue affecting *developing countries*, and 3 specifically highlighted *India* (2 of these participants grew up in India). 1 individual said that *"dirty water is bad for us,"* and 7 said *"water is important",* and 4 discussed *environmental issues* that affect water, such as pollution. *Poverty and regional disparity* was also frequently discussed (13 cases, 59%) as context for the water scarcity issue. Just one participant, Parthiv, reported that he did not realize that the game was intended to address access to clean water until he read the mission statement during debriefing. He said, "actually, I didn't know about the problem with the clean water [in the game]." He said that he knew there was dirty water in the game, but thought that the core message of the game was that "we should not ask small children to work" and "that girls should study." He explained that "I knew the problem--that education is a problem--very well, so my first thought [...] was the problem related to education [...] Actually, at the time, I had already made up my mind that that was the problem. There's the social issue - education. Nothing more than that." He was already of the opinion that "this is the burning issue in some African countries, and Indian and Middle Eastern countries--that they are forcing small children to work instead of doing their studies." Parthiv was one of 3 (13.6%) participants who highlighted child labour (not girls' labour specifically) as a content theme.

***Education****. Access to education* was also a frequently identified theme-- 11 participants (50%) described universal education as a target issue in the game's message. The *relationship between access to education and access to clean water* were discussed by only 6 of those participants unprompted (27% of the total sample).

***Gender inequality****. Gender inequality* was also identified as a target issue by 13 participants prior to debriefing with the mission statement, however some of these participants (4) said that they were unsure that the designers actually meant to address gender roles. Only 6 of these participants talked about the *relationship between gender inequality and water,* and,

in the interview, the other participants suggested that they did not understand that the mission was specifically connected to ensuring that *girls* are educated.

***Taking action.*** The persuasive messaging regarding taking action about the issue was salient to some players as well: 5 people included the message that *"you can do something"* in their descriptions of the game's messaging (unprompted). For many players, however, the store was confusing and/or not transparent in its purpose. One explained that he "had no idea where those [pencils] were coming from" and others (2) thought that the pencils were simply in-game currency—they were surprised that buying pencils required you to "spend real money" and a few (3) expressed concern that kids would not understand the significance of the button. One parent was concerned that kids would feel **"**guilted**"** into buying something (see Cassandra in the vignettes).

**Salient non-procedural content**

***Scenery.*** In total, 17 participants (77%) commented on the background or scenery they saw as the backdrop during gameplay or during the cutscenes. In some cases it was unclear which content the players were referring to, but 10 participants specifically referred to the scrolling backdrop, and 6 specifically identified the cutscenes as a source (3 explicitly referred to both). Most of the comments about cutscene content concerned the first cutscene; only two players commented on the scenery from another cutscene both commented on scene 3, specifically. The first cutscene was noted by 5 players for showing the contrast between the large urban centre in the background and the small run-down buildings in the foreground, where Maya runs, and was interpreted as showing *poverty* and *disparity*. The scenery in the third cutscene was notable to the two players who mentioned it because it shows a stream that Maya needs to traverse. They both commented that the stream seemed incongruous in terms of the overall narrative. One asked, "why didn't she just take some of that water instead of going, like, to the end of the water? [...] Maybe that water was not clean, but I was not aware! It looked fine to me."

Seven players (32%) related the environment in the backdrop to the location where the story is set: 2 players from India noted during the think-aloud that some script in a shop

window was written in Hindi, and 3 other players noted the script as well (2 were not sure what language it was, but thought it suggested a Middle Eastern context). Two players (who both skipped the App Store) expressed conflict about the environment related to the fact that they had no idea where the game was taking place—one said that because she did not know "where they were, specifically" it seemed like an "odd representation of a developing-world country." The other conflicted player explained that the scenery seemed unrealistic and that she "didn't feel that this was happening in a real place" and "it was weird that there were no people in this village."

***Character design.*** Fourteen (63%) participants talked about Maya's character design--4 spontaneously, during the think-aloud, and 9 more only in the interview. Thirteen focused on her appearance, and just 1 talked about her voice—he thought that she did not sound like a person from India. Four participants thought that her clothing helped to communicate the setting; 2 said they made assumptions about where she was from based on her skin tone. Four participants discussed her appearance in terms of stereotypes. One participant thought that her stereotypical appearance might contribute to reducing Maya's individuality and decontextualizing her story. In contrast, the other three people who discussed stereotypes thought that activating stereotypes about developing countries might be helpful in communicating the game's message, if handled carefully—2 of these participants suggested that further developing Maya's back story and clarifying the setting of the story would enable the designers to handle Maya's story with greater sensitivity. One participant suggested that Maya's outfit conflicted with communication of the urgency of the situation—he thought her appearance didn't "fit the stereotype" of poverty so players might not realize that her character had a real need. None of the participants who discussed stereotyping were from India. Only two players commented on the design of non-player characters—both said the contrast between how the boys and girls were drawn was not great enough for them to tell them apart.

***Music and sounds.*** Twelve participants commented on the music, but only two related the music to Maya's setting. One said that he found the music confusing because it "starts out, like, what I would think of as the Indian subcontinent, and then it becomes, like, Aztec." Another thought the music seemed "occidental" and suggestive of India or Pakistan. The other

players' comments related to enjoyment—6 thought it was "good" or "soothing" while others (4) found it "annoying". Two of the players who said the music was annoying initially said during the think-aloud that the music was good, but later changed their opinions--one said that the music was overly repetitive, and the other said was "generic" and that it "was bothering me." Only 3 players talked about the sounds in terms of the feedback they provided: two said that the “bloop, bloop” sound was “helpful” and one commented “the sound for hitting rotten mangos doesn't sound particularly negative. It's a lower-pitched water drop sound.” It is not clear what led that player to believe that the dirty water drops were rotten mangoes, but he never figured this out.

***Production value***. Some players' comments related to the perceived production quality of the game. Two participants suggested that the overall quality was high because of the quality of the animations, that the game seemed "well-developed" and like "a lot of effort went into making it very smooth." Five said that the graphics were attractive, "beautiful" or "enticing." Two others said that the game's interface and visual design were "very nice." Overall, it seems that the game met expectations for production quality.

**Content-mechanic and Multimedia Integration**

Most players commented on how Maya's dilemma was communicated in gameplay, and they identified very interesting and sometimes unexpected conflicts in their personal experiences of the game. In this section, I will present some of their comments and arguments. To make sense of their comments, I have drawn upon the vocabulary suggested by Feinstein and Cannon (2002) presented in the theoretical framework.

***Rule for the core mechanic: If your pot is broken, you have to start over again.***

Three players (13.6%) said that it was appropriate that Maya always had to return to the start if she broke her pot, and that in a way, this was realistic. Asif explained, "it was realistic in the fact that she needs to gather water, and no matter how many times you have to do the level, you still have to get 100% in order to finish up." Two other players commented that returning to the beginning was annoying and did not attach any significance to it. This *symbolic representation* of Maya's challenge seems to be a missed opportunity, because so few players identified it.

***The real-world motivation for the core mechanic: Get water for your family to [do something] and to [get back to school].***

Martin suggested that the core mechanic did not really make sense to him when he considered Maya's motives. He explained:

> It's weird--like, she goes along, gets droplets of water, um, and just stockpiles a bunch of water ... And then she goes and cracks her pot, which would make her lose all of the water, which really doesn't make sense. Like, theoretically, she would just go get the water and bring it back to her family, but instead she gets more and more and more, and then, like, loses all of it, you know?

He seems to be wondering why she needs so much water, or why she would keep taking risks with it once she had it. That is, her goals lacked *alignment with the real-world* motive. Cassandra and Marius similarly suggested that providing a little more detail regarding Maya and her family's need for water would help to communicate why water scarcity is "a big deal". It may be that Martin did not connect the rather abstract "target amount of water" to Maya's

fictional motivation to get back to school. Only two of the cutscenes he watched were set at the school, and he did not linger long in the App Store, where the description of her story might have established her motive more clearly. Jamie similarly noted that he had not really considered "getting to school" to be part of Maya's motivation because "the goal of the game wasn't to get to school […] It wasn't like you have to gather all your books or something. I was collecting water in the game, so I thought of only that [...] I felt like water scarcity was, I don't know, maybe seventy-five percent of […] what I took from what I saw in the game."

***Secondary mechanic: avoid obstacles [any] to [keep getting water] and to [avoid losing water].***

Some players (4, 18.2%) commented on the metaphorical purpose of the enemies and obstacles "to overcome" seemed realistic, but others (6, 27.3%) commented that the choice of a peacock as an obstacle seemed incongruous with the mission of raising awareness-- though it was "fun" and "entertaining" to shoo them away. Martin commented, as he was playing, "Now, I'm afraid I'm being misinformed." Here, it may be that the fidelity of representation was too low to feel credible, and so distracted from the reality communicated on the symbolic level.

***Secondary mechanic: avoid obstacles [dirty water] to [avoid losing water].***

The dirty water was one of the most frequently mentioned obstacles—the players thought this was realistic and appropriate for the message. However, some players commented that the dirty water did not seem to function realistically. Tiffany suggested that the dirty water avoidance (and purification) mechanics could be modified to better support the message:

> When you get the bad water--like, you lose points when you get the bad water, but I know that bad water can make you sick, so maybe it slows you down or something.

The dirty water drops were also confusing for 2 players; one player said, "I don't know what was the thing that was reducing my points [sic]." The observation notes confirm that he was just running right through the "bad" drops for much of the game. Another player thought that

the water drops were “rotten mangoes,” so although he commented that the water purification tablets seemed realistic, it’s not obvious what he thought they would be used for. They seem not to have read the instructions that popped up during the tutorial at the start of the game—the pop-ups seemed to be disruptive to early experimentation with the novel gesture-based interaction. It may be that alternative ways of presenting those instructions could have been helpful. One suggestion was that Maya could offer feedback if the player continued hitting the bad water mid-game. Here, testing alternative *multimedia integration* techniques regarding the feedback system might help players recognize the correspondence between the in-game content and reality.

***Secondary mechanic: collect [mangos] to [get extra water].***

Rory asked, “Who cares about mangos?” Candace suggested that Maya might tire and slow down, and that the mango collection mechanic would make more sense if collecting mangos relieved Maya’s fatigue. This suggestion would increase the *functional representational validity* of the *content-mechanic integration*.

***Tertiary mechanic: complete assignments to [gain pencils] to [upgrade Maya’s skills] to [get water].***

The earning and buying of “pencils” mechanic was perceived by some players as supportive of the message, who noted that the pencils was symbolically related to education, but the connection between the in-game activities and increasing Maya’s ability to collect water was considered by some to be “too abstract.” Another commented, “How do you get bigger water drops by spending pencils-- I don't know …” Two players said they had “no idea” where the pencils were coming from, which suggests that better *multimedia integration* of in-game feedback or tutorial content might have helped them to make the connection.

***Integration between the tertiary mechanic and the persuasive functions: spend money to [gain pencils] to [help girls like Maya] and to [upgrade Maya’s skills].***

Not all players located the opportunity to purchase pencils, and some who did find it suggested that the real-world purpose of pencil-buying activity was not described in enough

detail for them to be comfortable using it to make a donation. Additionally, some players worried that the fact that it was not described *transparently,* and that purchasing was "too easy" to use, might make it a "dangerous" feature to use in an application that might be used primarily by children. Indeed, even two of our adult users tried to buy pencils and were surprised to find that they were not simply spending an in-game currency.

***Fidelity of the non-playable representations of civic content.***

Veronica, Rory and Cassandra all suggested that increasing the *fidelity* of the representation of Maya's community might help to support the message. Veronica and Rory suggested that showing more people would contribute to the sense that her story was occurring "in a real place," while Cassandra wanted more detail to enable the player to "visit another culture." Two players from India also felt that "the slum area" could be enhanced to give a better sense that "the girl is surviving in a slum area"—they suggested showing "dirty rivers, some pipes, manholes […] and animals, like cows and buffaloes," and showing "some villages, not only slums," because such areas are also affected by water scarcity.

***Multimedia integration: Unintuitive location of the mission statement.***

The game's mission statement was located on the "About" screen, which was accessible only by first clicking on the Settings menu. Only three players located it independently, and the others, when debriefed, suggested that they would not have thought to look in the Settings menu for a mission statement but that its message was clear and clarified the purpose of the game.

***Multimedia integration: Conflict in co-presentation of feedback with direct messaging.***

The co-presentation of player feedback and direct persuasive messaging may also have contributed to confusion as to their content and purpose, resulting in a lack of *transparency*. Neal's experience with the quotes illustrates this tension. Each user-submitted quote supporting the cause was presented in a pop-up box with an animated status bar and a percentage indicating progress towards the current water collection target below it. In the interview, when asked if he

noticed the pop-up messages, Neal said, "If you make any mistake immediately after that a message comes, like, so we can improve our mistake very easily in this game." The pop-up messages did not identify errors, and none of the written messages were relevant to gameplay. Given that the message box appeared only under failure conditions, the assumption that the box contained tips is not an outrageous assumption on his part. He seems to have expected that at least some of the messaging would be feedback relevant to player failure because of this contingency. As well, pop-ups of a similar size were used in the tutorial level of the game to present instructions for the player.

It is also interesting that Neal's response in the interview focused on the feedback on player progress and does not address the social messaging that accompanied it. This is surprising, because he actually read two full quotes aloud and asked about others during the think-aloud. On two occasions he noted the name and location of the submitter. When asked what he thought the pop-up was, he said, "I don't know," and later he asked, "How does [sic] it come here?" By the end of the think-aloud he started reading the completion feedback and the messaging together: "So this time I got 100 percentages [sic] and this is from Patrice, 17, Washington." Here, we see that Neal knew that the percentage related to his own progress in the game, and that he was aware that a message from someone else was being displayed.

***Multimedia integration: Direct messaging resembled social network integration.***

The second way in which the quote integration may have been misleading was that social network integration in mobile (and other) games is very common, and this feature is typically used by players to share their scores. Four players suggested that the quotes were meant to offer a social comparison with other players' performance. Even Tiffany, who seemed to attend closely to the content of the quotes, expressed this misconception about their content. She explained that the quotes were "people who are connected on the game, and, uh, *how well*

*they do, obviously*. And, um, what they think about access to free education." This illustrates her assumptions (1) that the quotes were provided by other players, and (2) that at least some of the pop-ups would be related to in-game performance.

**Player Outcomes**

In this section, I describe player outcomes in terms of perceived learning, information-seeking about the social issues, perceived effectiveness of the game as a means of raising awareness, participating in activism, and discussion of the game.

**Learning with *Get Water!***

Just a few players reported learning "something new" from the game. Three commented that they had never before considered water scarcity "as a barrier" to education, but they only said so after being debriefed with the game's mission statement. One explained, "seeing that [mission statement] and how the game worked, I mean, you can kind of see where they're leading in that there is a correlation between gender inequality and access to water."

Two players suggested that they learned that they like gesture-based games, and 2 expressed interest in how video games can be used for social messaging. One said, "I would have never done that with any other iPad game or most other video games […] It's the first time I ever thought about anything else in the game than the gameplay."

Prior to debriefing with the mission statement, two players (both from India) who said they were reminded of the importance of "saving water" or "saving rainwater" without much further comment, and suggested that others would learn "the same thing …" While this was a non-target message, there are very obvious reasons why these players may have perceived support for water stewardship or rainwater collection message in the game—one of the bonus items in the environment is a "rain jewel" that triggers a rain shower. Additionally, both of these players said they thought the game's scenery and messaging were intended to contrast access to water between urban centres and villages. Indeed, the contrast between a developed city and the village where Maya lives is featured prominently in the opening cutscene and was commented on by other players as well.

Of the 12 players (54.5%) who said they did not feel they had learned anything from the game, 3 said that they game did remind them of what they knew about the issue, and one suggested that she reflected on how her life is different from Maya's. She explained, "Well, they didn't give you that much information, but you kind of got the idea that in other parts of the world, like, life is tougher, and maybe even that we should be happy with what we have." Another said that "the quotes and stuff made me think more about […] the environment and things that were connected to the real world."

A number of the players' comments addressed what the game might teach someone else. Two individuals who had personal experience of the issue said that they already had prior knowledge but thought *Canadians* might learn something because "That's not something you see every day" and "in Canada this is not really an issue so a lot of people don't know about it. They just take it for granted, but the game still tries to show that water is important."

Four players (18.2%) said that the game would not teach other adults much, and that most adults already aware of better sources of information. One said, it "wouldn't teach others if they read the newspapers or have friends with first-hand knowledge" and another said "It wasn't […] as relevant. It's like, "Oh, you're telling me something I already know"—and they're not telling me anything new about it either." 8 players suggested the game could have use for children or people who lack prior knowledge. A more in-depth look at the players' views on how the game communicates is presented in the vignettes.

The majority of participants agreed (15, 68.2%) or strongly agreed (3, 13.6%) that they were interested in learning more about water scarcity. Just one participant marked "strongly disagree" and one marked "disagree" in the post-play questionnaire. Ultimately, 8 of the 18 participants who returned the one-month follow up questionnaire (44.4% of respondents) tried to learn more about either girl's access to education or water scarcity—5 respondents (27.8%) said they tried to learn more about water scarcity, 1 just into girls' education, and 2 reported trying to learn more about both issues.

**Perceived Effectiveness of the Game as a Means of Raising Awareness**

In the post-play questionnaire, the participants were asked to rate their level of agreement with two statements about the game's target messages. Twelve (60%, including 1 educator) agreed or strongly agreed with both of these statements: "This game is an effective way to raise awareness of water scarcity" and "This game is an effective way to raise awareness of the relationships between water scarcity and girls' access to education." Six players (including 3 educators, one of whom is a parent) disagreed with both statements. Two players with personal experience of the issue agreed that the game was an effective way to raise awareness of water scarcity, but not of the gendered issue. A more detailed look at the responses of the players with personal experience, the "Supporters" and the "Naysayers" is presented in the vignettes.

**Taking Action**

No clear pattern of outcomes was discernable based on the civic engagement scores. Based on their profile responses, this sample of players was relatively civically engaged, but none of the respondents reported directly participating in campaigns about the target issues. The group did report participating in civic activities during the follow-up month, through donations (to a flood relief foundation (1) and an AIDs foundation (1)), participating in 30 hour famine (1), consumer activism (food purchases (1)) and taking part in discussion on social media (about the status of women in the UAE (1), and about a topic not specified (1)).

**Discussion of the Game**

Of the 18 participants who returned the one-month follow-up questionnaire, 16 reported that they discussed the game with someone else. The participants were asked to describe what they discussed about the game and with whom. The most popular response was "friends" and some also reported discussing the game with family and significant others (e.g., romantic partners). These responses are summarized in Table 7, below.

Table 7.

*People that participants reported discussing the game with.*

| ***Community member*** | ***Number of cases*** |
|---|---|
| Friends (total) | 11 |
| … in the gaming industry | 1 |
| … from India | 2 |
| … who has children | 1 |
| Family member(s) | 6 |
| Significant other | 3 |
| Colleagues in education | 1 |

*Note. Some participants reported discussing the game with more than one category of person.*

The most frequently provided reasons for discussing the game were; the game's message or concept (7, 38.9% of respondents), that they thought a friend would like it or be interested in it (2), that the game was good (4), and that they wanted to tell someone about the research study they participated in (3). Most of the people who reported discussing the game had either agreed or strongly agreed that the game was an effective way to raise awareness of water scarcity, (see Appendix N—Educational Profile of the Sample

Table *N.1 University Degree Attainment and student status.*

| | Level of education | | | |
|---|---|---|---|---|
| | Bachelor | Master | Doctoral | Total |
| Students (degree in progress) | 11 | 7 | 1 | 19 |
| Non-student | 1 | 1 | | 2 |

*Table N.2 Subject Matter Studied*

| Discipline | Count * | Examples |
|---|---|---|
| Social sciences | 8 | political science, human relations, education, educational technology |

| | | |
|---|---|---|
| Humanities | 8 | liberal arts, journalism, music, film studies, cultural studies, language studies |
| Engineering | 7 | civil, electrical and computer, industrial, mechanical |
| Business | 1 | accounting |

*Some participants reported having completed studies in more than one discipline.

**Appendix O—Gaming Profile of the Sample**

| | Reported playing an endless runner game? | | |
|---|---|---|---|
| Gamer group | No | Yes | Total |
| High frequency (plays almost every day or several times per week) | ***3*** | ***8*** | ***11*** |
| Casual only | 1 | 1 | 2 |
| Generalist | 2 | 6 | 8 |
| Non-casual only | | 1 | 1 |
| Medium frequency (plays several times per month) | ***2*** | ***1*** | ***3*** |
| Generalist | 2 | 2 | 4 |
| Low frequency (plays a few times per year) | ***3*** | ***1*** | ***4*** |
| Casual only | 2 | | 2 |
| Generalist | 1 | 1 | 2 |
| Non-casual only | 1 | | 1 |
| | Total | 10 | |

*Note. The participants are grouped by their reported "games played" in the last year.*

**Appendix P—Civic Engagement Profile for the Sample.**

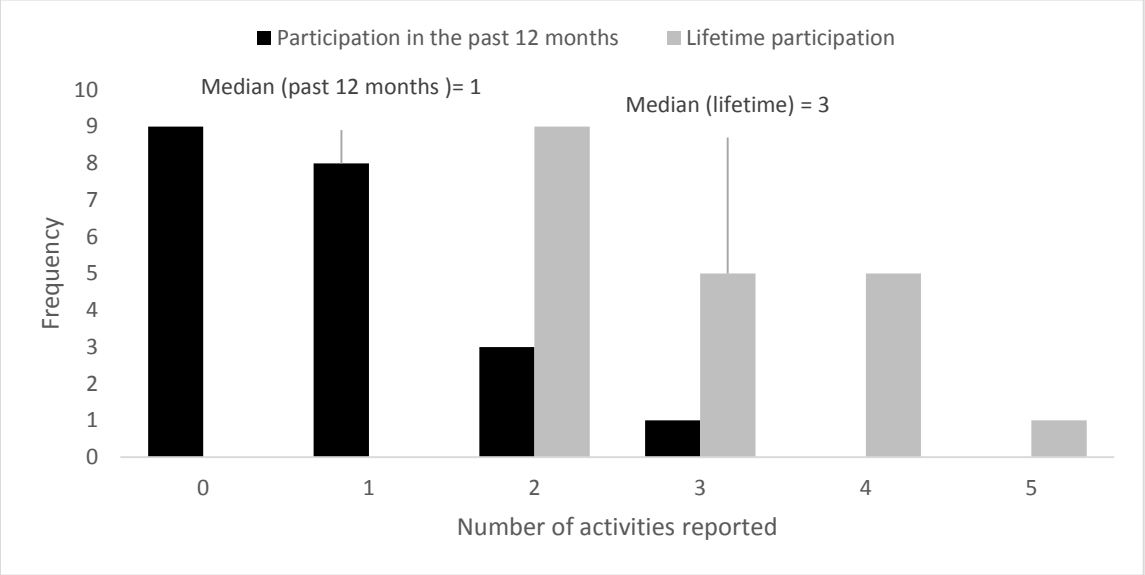



*Figure P.1.* Number of civic behaviours reported in the past 12 months, and at any time in the past.

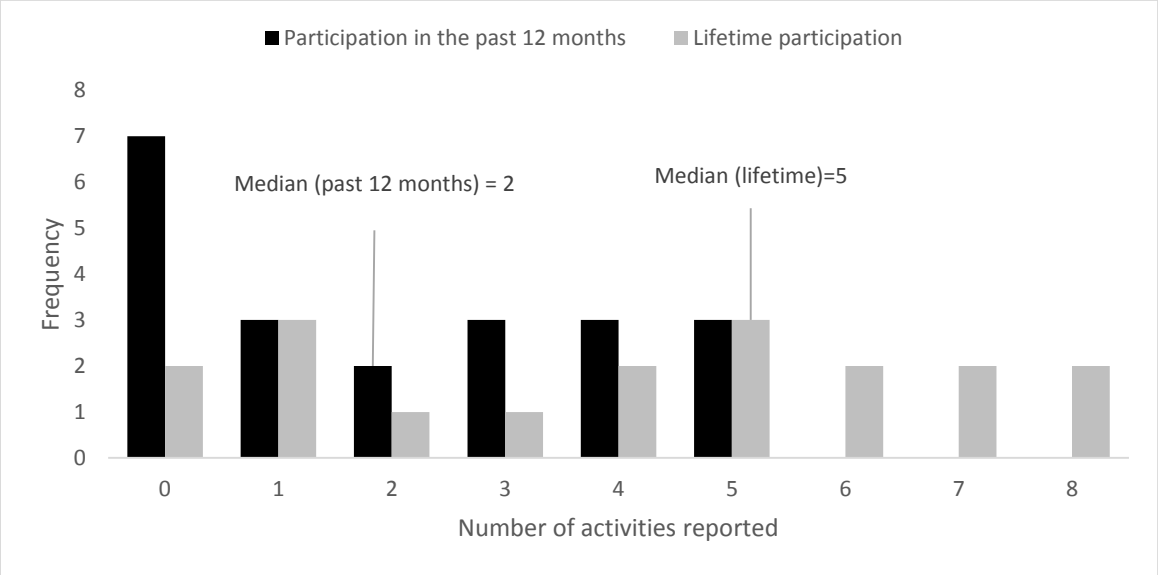
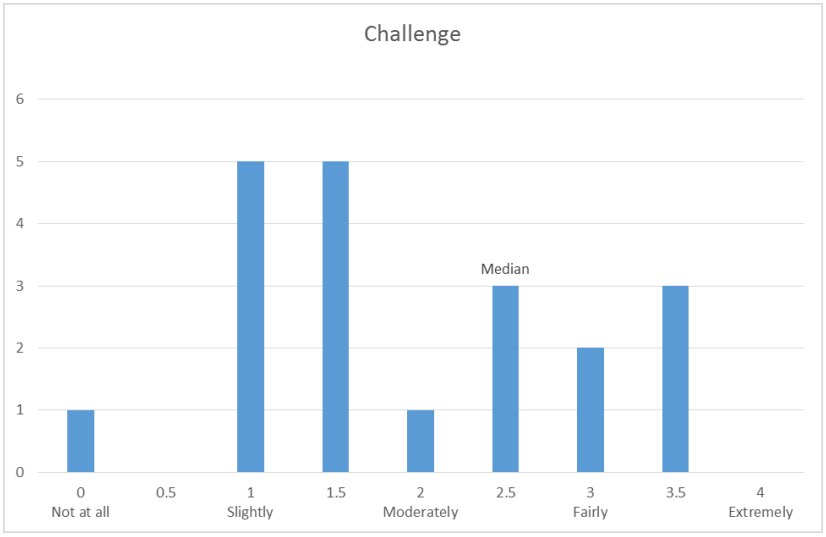
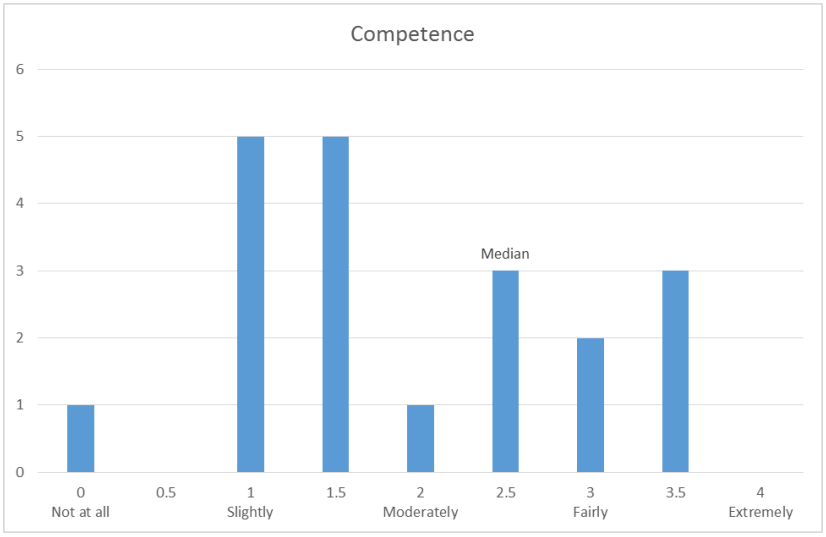
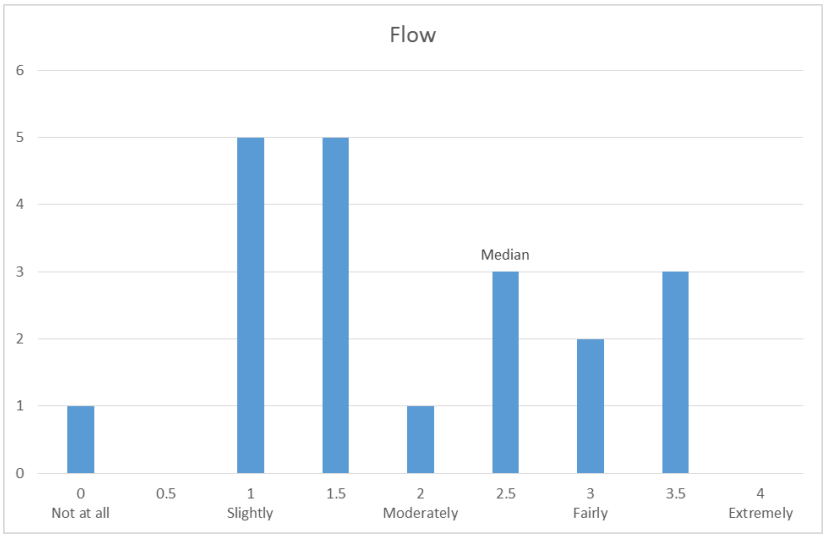


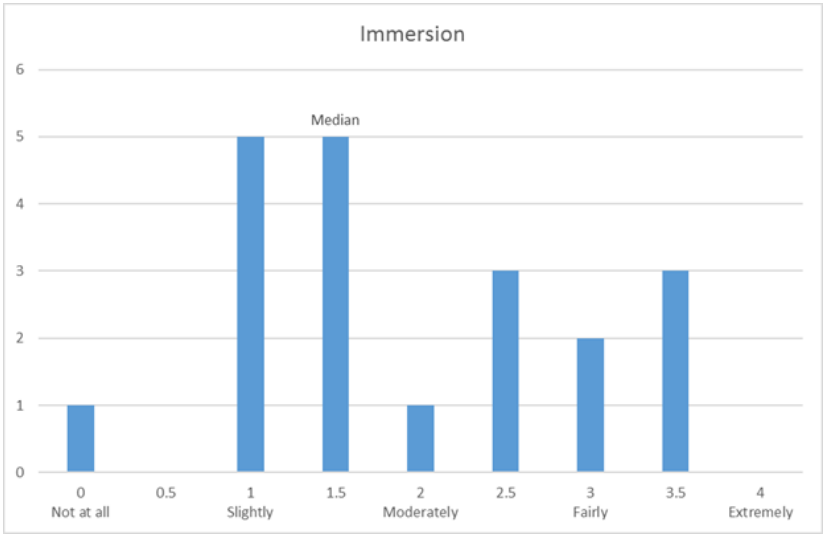

*Figure P.2. Distribution of reported participation in expression of public voice for the past 12 months, and at any time in the past.*

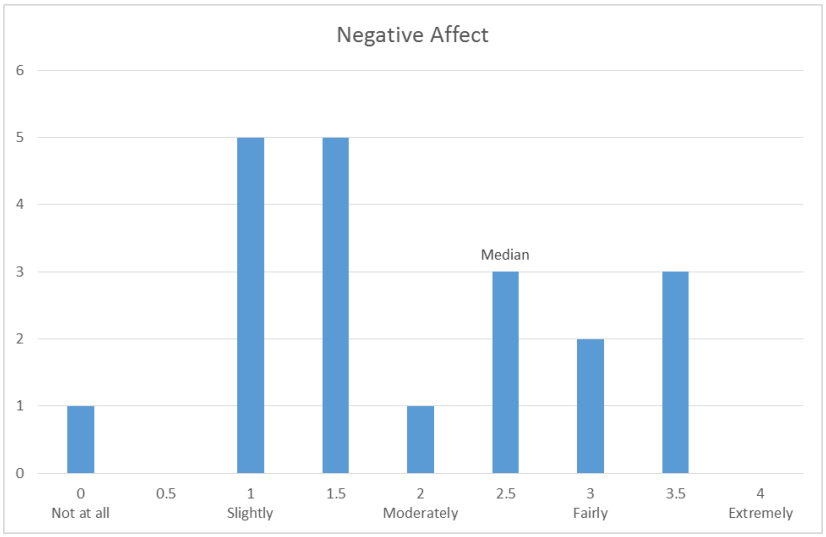
## Appendix Q—iGEQ Subscale Distributions




Flow
6
5
4
3
2
1
0
Median
0
Not at all
0.5
1
Slightly
1.5
2
Moderately
2.5
3
Fairly
3.5
4
Extremely


Immersion
6
5
4
3
2
1
0
Median
0
Not at all
0.5
1
Slightly
1.5
2
Moderately
2.5
3
Fairly
3.5
4
Extremely


Negative Affect
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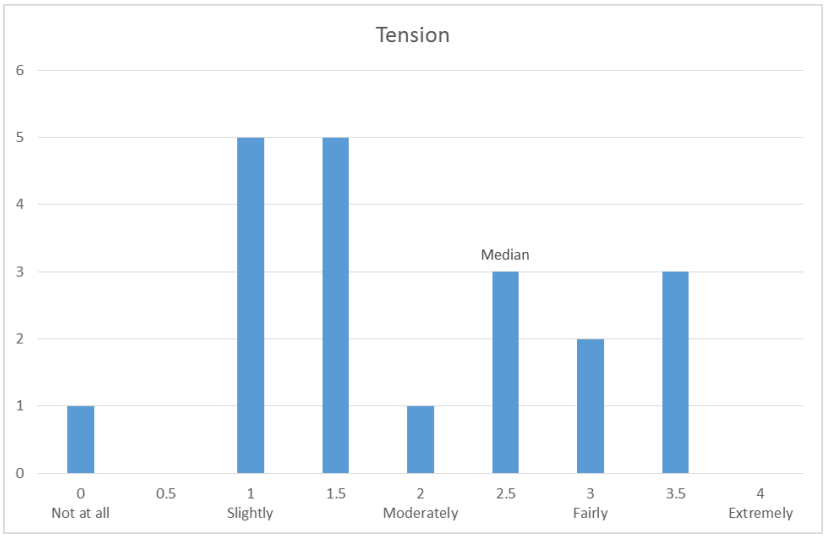
5
4
3
2
1
0
Median
0
Not at all
0.5
1
Slightly
1.5
2
Moderately
2.5
3
Fairly
3.5
4
Extremely


Tension
6
5
4
3
2
1
0
Median
0
Not at all
0.5
1
Slightly
1.5
2
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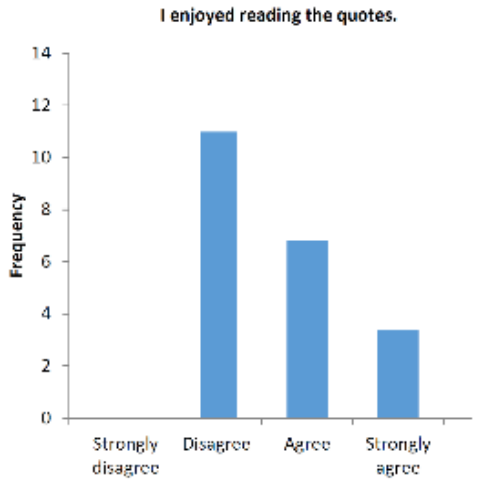
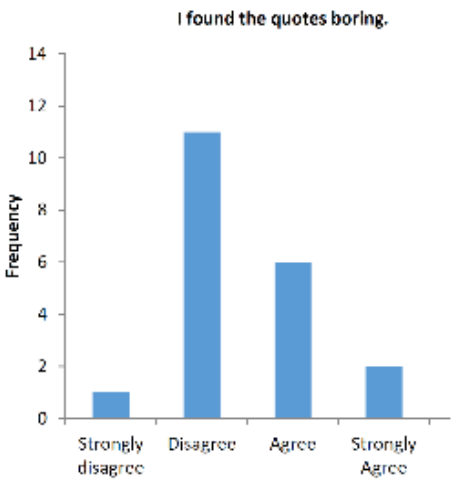
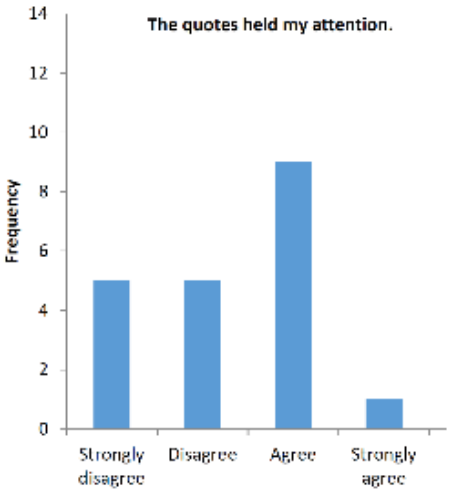
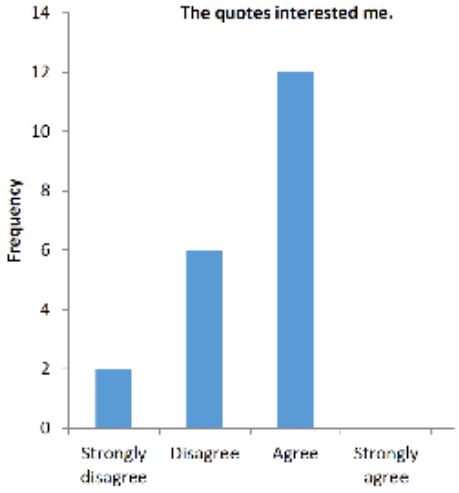
3
Fairly
3.5
4
Extremely

## Appendix R—Quote Engagement Items



**Appendix S—Discussion of the Game at Follow-up**). Of the 4 participants who disagreed or strongly disagreed that the game was effective, 3 reported discussing the game. It is interesting that two participants who disagreed that the game was effective each nevertheless discussed the game because they thought “friends” or “a friend […] who has a young child” might like it. Two participants reported that one of the reasons why they discussed the game because it was “linked to the UN” or because “the game won awards”.

**Player Vignettes**

In this section, I present vignettes illustrating various perspectives on the *Get Water* experience. In each narrative account, I will first briefly describe the participant's background and then relate his or her interactions and experiences with the *Get Water!* to the evaluative comments shared immediately post-play, and in the follow-up questionnaire. After each vignette, I discuss how the highlighted cases compares with others in the sample.

**Cassandra: Coplaying for Enrichment**

Cassandra was selected for in-depth description due to her approach to the game, which she evaluated primarily from a parent's perspective. Cassandra's case is notable in that she explicitly expressed interest in the educational potential of the game for a specific audience, her children, and for a particular context of use, coplay with children. She also is one of only 3 participants who explicitly identified socialization as an educational goal of this game.

Cassandra was a 36-year old university administrator. She obtained her BA in Languages and MA in Intercultural Studies in Ireland. She had considerable international experience, having worked in several European countries and in Japan for several years. She did not personally play mobile games, and did not report having played any games in the endless runner genre. She had two children, aged 5 and 8 at the time this research was conducted. She owned an iPod Touch that she used to download games for her kids to play, so she was familiar with the App Store already. Her evaluative orientation seems to frame her experience with the game, even beginning with her initial comments in the App Store.

During the think-aloud, Cassandra referred to the game screenshots, the text description, as well as the standard App Store metadata as she voiced her thoughts about the experience. Her comments clearly indicate that she was evaluating the appropriateness of this game for use with children with respect to her own ideological values, the quality of the game, as well as her assumptions about children's preferences, social and cognitive development.

Cassandra alludes to her ideological orientation right from the start of her commentary. "Okay, just looking at it, like, I like the image because it's a girl […] I'm always trying to find

something for my children that has a female role model. And just to look at it quickly here, I don't know if it's a feminist one, but I like that it looks like the female is the main character."

After scrolling through several screenshots, she continued, "Well visually, it looks really, really enticing to children and I would be happy with it because it's educational […] I like that it's educational and environmental." It is not clear, at this point in the playtest session, what Cassandra had in mind when she uses the word *educational,* but her comments indicate that she considered the approval and authority of the UN to be an indicator of the game's quality. She said, "I would be inclined to get it because it won– The reviews look good and winner of the United Nations, uh, although I don't know this particular one, but I think it looks like a good seal of approval if the United Nations has awarded it."

Next, she checked the target audience for the game. "It says it's-- So that's, oh okay. I'm trying to figure out the age. Four-plus, okay." The age-appropriateness of the game content emerges as a highly valued concept throughout her commentary; she revisits this information several times in the think-aloud and interview, as she encounters the cutscenes, the user-submitted messages, as well as the integrated social media tools.

Cassandra's think-aloud comments suggest that the contents of the App Store description were sufficient to convince her that *Get Water!* would be suitable for children. Although Cassandra did check the ratings and reviews for the game, she only did so after declaring, "Yeah, it looks like something I would definitely download for my children." After briefly visiting the Reviews tab, and noting that the app did not have many reviews, she launched the application.

Cassandra immediately launched the gameplay without clicking any other icons on the Home screen. As she played, her comments indicate that she was evaluating the game in terms of usability, with the target audience of children in mind; specifically, she comments on the required reading level of the player, control of movement, and the amount of guidance offered. While watching the opening cutscene, she said "Okay, this is good because it explained it without someone having to be able to read." Cassandra returns to the idea of audience reading ability several times during the playtest, and again in the post-play questionnaire and interview.

Cassandra's experiences of having difficulty using the boomerang and controlling Maya's movements seem to factor into her evaluation of how suitable the game would be for children, and she explicitly refers back to the recommended age (4+) identified in the App Store description. While completing the tutorial, she comments "It's going quite fast, actually […] I find it's going a little bit fast for a four year-old to be able to follow that. [Long pause] [Reading] "Stun the peacock before it cracks your water pot." And also, I think a lot of four year-olds wouldn't be able to read this." Many of her subsequent comments address knowing how to play, for example, "I see all those groups of water drops together but I'm not sure exactly how I'm supposed to be getting them […] so I just do a line underneath or go through all of them? I don't know." She seemed to find the swiping input method challenging and counter-intuitive, saying "I'm missing getting the mango and the prizes. I don't know how much I can, how agile it is. Like she doesn't exactly follow my lines. I thought she would move with my, with my lines." Cassandra concluded, "[…] my seven year-old would be a lot more able to use this than my four year-old [long pause] because it's a bit fast." She also wasn't sure whether or not she was progressing at all, which likely reflects on her lack of familiarity with the endless runner genre. For example, at the end of her first run, she said "I'm trying to figure out whether I passed that last level or not […] So, I'm basically playing it over and over?"

Cassandra's comments indicate that she expected progression in the game to require *exploration* and learning about another culture more than she experienced in the play session. Like some other players (5), her comments suggest that she found the repeated use of the same background scenery confusing and also repetitive. Upon unlocking the second custcene, she said, "this looks more interesting now because I feel like I'm on an adventure to the next level. I've unlocked something. [Pause] But now it actually looks like I'm going to the same thing. Oh, I must have gotten back to the same– Oh. I thought I was going into a different type of level where I would find out something cultural about, I guess, whatever country I'm supposed to be in–I assume it's India–but I thought I was going to go to something more mysterious, something more cultural."

She also voiced her expectations for what the cutscenes would reveal, saying "I think I like when we get to the classroom because I feel like the teacher might teach us something,

explain something." When later asked to elaborate on her expectations for how players might learn about another culture, she explained that she was interested in Maya's cultural environment and how things are done there:

> I guess that I thought that I would be learning a bit about--well, I don't really see anything other than the houses, like, I don't really see how the people live and there was nobody else in that scene besides the mom and the girl […] Like, you're not really visiting the place because you don't really see too much about how they live […] I just saw inside the classroom, not even how it was functioning other than that everyone was sitting down and it kind of seemed traditional and um- I mean it's mangos flying in the air and peacocks so it's, you know, not really--and then the background is just the houses. I don't see people in the doorways of the houses and I don't see shops and I don't see the kind of daily life as much.

Much of Cassandra's commentary during the think-aloud involves her questions and reflections about the game creators' design choices and intent to inform. Cassandra's interview responses illustrate that she was thinking critically about how the game designers might intend to communicate social realities. In particular, gender roles in the game were notable to her, as evidenced by her reflections on Maya's role, and that of the male teacher depicted in the second cutscene; as well as the depiction of social disparity, evidenced by her comments on the setting.

Cassandra said that she enjoyed the game, and when asked to elaborate, she said, "I enjoyed that it was a female character […] But when I first saw the girl, I thought we were going to do more adventurous things rather than just working and picking up water. You know, there's Dora The Explorer, who I don't particularly like either, but I think for girls it's fun because she's an adventurer. So that, I would have rather it–if we had other adventures, but I suppose the whole purpose is the environmental message […] I thought that she would be like a hero in the story." Her comments suggest that she values active and "adventurous" roles for female characters and did not feel that Maya's *simply being female* was ideal, because Maya did not have much agency. Cassandra was interested in knowing more about Maya. She said, "Well, [Maya] looked very cute in the first image. She looked like a girl who is good at following

orders, knows that she has to work [...] She's helping her mom. I assume she goes to school because she's going in and out of the classroom. She looks kind but I don't really have a sense of her character […] I saw her as the next generation born into a certain social class or a certain part of the world that has hardships to deal with and has to get on and do it because that's the reality of how tough her life is there."

Cassandra reflected on the designers' intent to communicate as she played the game. When considering the setting, she said, "I would be curious to know why, um, the image shows kind of a shanty town with the tower blocks behind. I understand that that is poverty–they're trying to show poverty–but I don't know … Is there water in the more advanced part? I don't know exactly why this particular image was shown, was chosen." During the interview, when asked to state the social issue depicted in the game, Cassandra's response suggests that the scenery in the opening cutscene was highly salient and factored into her interpretation of the game. She also evaluates whether or not the graphical depiction of disparity in the game's setting would be obvious to a child.

> I would state that [the issue depicted] predominantly–and it's even called *Get Water!*—was the shortage of water, the difficulties of getting clean water. Um, the fact that it showed like a slum area and a very developed part of, I assume it's the same place unless they're trying to show imagery of different countries, like the developing world against a non-developed world [sic], but to me, I imagined maybe a city like somewhere in India with the business area in the middle and that can be seen from a slum area. So I could see social differences between classes, and also perhaps not even the same environmental issues. So I doubt very much if somebody among the skyscrapers would have to worry too much about their water supply. So I think a child would be able to pick up on those differences as well.

Her statement of the game's purpose focused on the contrast between the developed city and developing village scenery, but did not mention gender, even though she commented on gender roles unprompted.

Cassandra also commented explicitly on content-mechanic integration in *Get Water!*, wondering aloud about the relevance of in-game activities to the social message of the game.

While playing, she asked, “Is the purpose really to teach the lessons or just to have fun trying to avoid peacocks and picking up mangos? Like, I don't know the purpose of getting the mangos and hitting peacocks.” In the post-play interview, Cassandra explained, “I was interested in learning more about the issues and not– I didn't quite understand, other than experiencing the frustration of not being able to keep water in a jug, I didn't really understand the purpose of the peacocks. I mean, I understand that in a game there has to be some challenge ...” Cassandra’s comment suggests that, in her view, the peacock obstacle and in-game mango collection assignment seemed irrelevant.

Cassandra consistently refers back to the framing of the social messaging for young users throughout the play session and interview. She suggests ways in which she thought the content could be reframed for children, while acknowledging potential limitations on design. For example, during the play session that she thought the messaging should be modified to be more effective for young users; she suggests that the scenario might be easier to understand if Maya’s need for water were more explicitly explained, “I think if the app said what to do, it would be easier for younger children, and maybe said why Maya has to get water, how difficult it is to get water. That–it's probably difficult to get–have it suitable for a large variety of ages.” In the post-play interview, when discussing the social message in the game, she returns to the problem of framing the social issue for children, who would not have the *prerequisite knowledge* to understand Maya’s motivation:

> I think the message was awareness that not everybody has access to clean, easy-to-obtain water […] I didn't receive the message about, like, how their life is difficult without it, just simply that they have to get it. So I think for a child […] they might not understand exactly why she really needs to get the water or how– Maybe at other levels, she can, but the levels that I was at I couldn't, uh, I couldn't see the urgent need, why it was so urgent to get that water and to get clean water.

When debriefed on the game’s mission (she did not find the mission statement herself), she said “Yeah, I think they definitely got their message across.” I pointed out that she had not emphasized the relationship between water scarcity and girls’ access to education in her prior statements and she clarified that she had been aware of the gender roles depicted:

> The classroom scene, to me, was so fast that it didn't even at that time register to me that it was the girl taken out […] but it was clear to me that it was a girl with her mother and I had said that the teacher was a male, so […] I was focusing a lot on the differences between the developed and the developing but I did also notice that a male was the educator.

She said that the emphasis on girls was "very subtle and quite fast" and that she thought that the disparity between the city and the village would be easier for children to "pick up on". She concluded, "I don't think that education issue comes across as clearly as the environmental issue."

Cassandra did not think the game was very educational on its own, but she could imagine using it with her kids. "[I] agree with their first paragraph [in the mission statement], which is, "Make entertainment educational." Because it is just an entertainment game. It's not an educational game except for their message […] If it was educational, like some mathematical ways of achieving something along with the social message, to me that would be a stronger game."

Cassandra also explained how she would use it with her kids. She said she'd let her kids play it, and then pose questions to help them to understand Maya's situation:

> I would let them play it first and then I would say, "What did you think about that?" You know, we would talk about the scene, we would talk about-- I think I would probably have to probe the question, "Who did you notice had to leave the classroom? Who did you see staying in the classroom? Do you think that's fair? […] I think the parent would have to pose a lot of those questions rather than the game, really. Like, I couldn't see my children saying, "Oh, that's not fair. The girl was taken out of the classroom and why is it just her that has to do it?

Cassandra's suggestions for improving the game's messaging about water scarcity all addressed how the creators could ground Maya perspective with concrete activities and motives that are "not too sad"—she thought the game would "get the message across a bit better" if "we can see that there's not enough water to do this activity that we have to do—we have to eat, we have to drink, we have to sanitize." She suggested that this content could be communicated

through “a cut to the home [… where] there's just not enough water to drink, or just not enough water to prepare the meal so she gets sent out again to get more water.” She wanted Maya to have a voice that provides feedback about her needs, “so that […] she tells you that you need more water, that you need it for whatever …”

With respect to the issue of gender inequality, Cassandra suggested that the cutscenes show greater contrast between the roles played by men and women, including “a longer shot of the classroom so you really see the boys staying.” She also acknowledged that it would be tough to illustrate the issue without relying on possibly offensive stereotypes. She said, “Like, this is bad too, but maybe [you could show] some men, who you often see in places sitting around together, but the mom and the daughter doing the work and actually getting the water.”

She said that ideally, she would like her kids to “use their brains” more when they play, “like, something more complex rather than just the entertainment value of picking up the raindrops.” She also said that developing social awareness was something she valued in games as well, and that she would want a game to build “an awareness of what life is like for other children in developing countries and maybe what we could do to help. You know, maybe have an awareness of not being wasteful of our own resources, our own water. I think that's very good for children and I don't think they're ever too young to have that message given to them. I think this game is very good at that. That seems to me to be a goal of the game, which is great.”

Cassandra’s commentary about the in-game store, both during the play session and post-play particular, strongly illustrate that while she was mindful of the designer’s good intentions. Her views on what children should be allowed to do guided her evaluation of the implemented persuasive elements in terms of emotional appeal and transparency.

When visiting the in-game store, Cassandra located the in-game donation opportunity. Although her initial reaction to the donation is positive, she immediate expressed her view that this feature is not suitable for children: “[Reading] ‘Buy 520 pencils and girls like Maya get better access to education and clean water.’ Sounds like a win-win solution. […] Oh, so this is where I actually buy, I can actually buy for poor people. Is that what it is, that it's donated

to—cancel—that I'm donating to poor countries? I know a lot of people, I personally would have problems […] for children to be able to buy on appliances […] I kind of feel that they don't understand that they're actually buying it and it's kind of pushing them into purchasing something that really is an adult decision, perhaps." In the interview, she explained:

> I don't agree with children's games where they might be able to purchase things with real money […] Even if it's for a good cause, I think they could say that if you speak with your parents, this is how you can donate to this charity or you can give pencils or you can do this. Which I mean, doesn't actually get the money necessarily spent, but I don't agree with having— I kind of feel like it's making children feel guilty that they should go and spend money on this and I don't think that's necessarily teaching them […] I really feel like it is kind of using children's vulnerability or guilt, like making them feel guilty that they have to go and do this and they should do this.

She was also concerned that children might not understand the implications of purchasing the donation item because of its placement in the store, which players also use to interact with Maya's abilities. She explained, "Well to me, I didn't think that [the purchase] was real. I thought that I was using my points to buy pencils […] I thought it was part of the game, like a points thing. You can get this many pencils and then maybe you would see the children in the school getting the pencils. But the fact that it's really there, I don't agree with that."

Cassandra's comments suggest that she perceived a tension between the use of age-appropriate message design and activities for children and achievement of the fundraising goals of *Get Water!*. It is particularly notable that Cassandra objected to the integrated donation opportunity based on the target audience *in spite of* her personal support for an international organization whose mission is aligned with that of *Get Water!*. When asked where she assumed the money would go, she explains:

> Well, I thought it's like UNICEF and I donate to UNICEF often and I buy, like, school supplies and pay for women to be educated, so I hope that they're— I mean, the fact that I saw a review, like an award from the United Nations, I'm

> inclined to think that yes, the money does go, like, UNICEF uses it, but I'm trusting them. I have real issue with using my children to get donations.

It is also notable that Cassandra was misled by the UN design competition award mentioned in the App Store description; the in-game donations were also not intended for a UN-affiliated organization.

Cassandra's concern about potential risks to young players posed by the integrated purchasing system were echoed in her comments about the integrated social media tools. After exiting the gameplay area of the application, Cassandra then commented on the social media icons located on the Home screen; here, again, she refers back to the age recommendation listed in the App Store description and her reservations about age-appropriate activities for children. "The Facebook and Twitter, when I see it on there, if it's really for four-plus, I wouldn't allow my four year-old to go on Twitter or Facebook and talk about a game online, because I find that dangerous when children can have access to purchasing things online, getting on to Facebook. I'm more concerned about, you know, the dangers of the Internet."

**Comparison with Other Cases**

Cassandra thought *Get Water!* was generally appropriate for a coplay scenario, and agreed that it was a good way to promote awareness of water scarcity as well as girls' access to education. In contrast, Michelle, who is an educator as well as a parent (her son was 6 years old) said she thought she might consider downloading it for her son because "it wasn't, like, excessively violent" but she strongly disagreed that the game was an effective way to raise awareness. She said it seemed "a little bit superficial, so it's hard to take seriously" and that it did not enable the player to share in Maya's experience like it might "if instead of jumping for mangos, we were actually feeling tired [or] if it was more of a simulation […] you could immerse yourself more into like what it might actually be like to be in a situation where you're trying to get water."

While Cassandra felt that simply developing her kids' social awareness was a good goal, Michelle explained that she did not think a game was the right medium for a serious message. She said, "I just don't really understand how the video game is supposed to have any sort of

real-world effect." When asked what she thought could be done differently, she, and that she'd prefer to take action directly:

> I would change it to make it more realistic if I was going to change it, but I don't necessarily think that, like, a video game is— Like, if I had to call the attention of the world to, you know, this crucial issue and this, like, no-name, no-face village, that's not the medium that I would choose […] I mean there would probably be something visual about it, but I [… might] write a letter, or try to inform people, or […] talk about it in my classroom.

She thought that the game would be more effective if there were realistic challenges "where you're actually thinking about it versus just, like, doing physical movements to get your little Maya or your little *Tiny Wings* guy […] away from peacocks and catching mangos." Michelle thought that a game about water scarcity might function better in a metaphorical sense; she speculated that if the player felt getting water was challenging, then "maybe that [feeling] transfers into your, sort of like, understanding of, like, how challenging it is to actually live that situation." It is notable that some participants in the study (5) did actually comment on the metaphorical representation of challenge in the game.

Other players also talked about playing the game with kids. In contrast to Cassandra and Michelle's views, two other participants (who did not themselves have children), suggested that overly high fidelity of representation in the game might make the game less engaging for children. For example, Tiffany explained:

> I think if they made it as real as possible […] it would be very boring to play … If I were thinking about kids, you know, my cousins who are younger, playing that game--if […] there's none of that, like, flying through the sky stuff and hitting things with boomerangs, they would be uninterested [sic] very fast."

**Candace: Playing for Transformative Education**

Candace's case is described in greater detail, partly due to her candid and rich commentary, but particularly as an illustration of how an educator with a (self-identified) critical literacy orientation may interact with and evaluate games like *Get Water!.* In this

narrative account, I will first briefly describe Candace's background, then relate her interactions and experiences with the *Get Water!* to the evaluative comments she shared immediately post-play and in the follow-up questionnaire.

Candace was a second-year graduate student in Educational Studies and had several years of teaching experience as an instructor of English as a second language and an instructor of pre-service teachers. She was involved in a research project addressing women's social justice issues in the month post-play. She was familiar with how to play mobile games in the endless runner genre, and was classified in this study as a frequent casual video game player.

Candace's interactions with the game application were more extensive and explicitly critical than the other participants; she visited both pages of the game's entry in the Apple App Store, and clicked on 7 of 8 available interface elements located on the application's home screen, including the Facebook icon, "Story", "Store" and "Assignments" icons. She was also one of only 3 participants who independently discovered and read the "About" page, which stated the game's mission and identified its creators.

Candace frequently voiced questions as she navigated the interface, beginning from the App Store. Her initial comments when visiting the App Store already suggest that she was interested in the goal of the game, and had expectations both about how that content should be communicated, and when it might be communicated:

> I'm just reading the background, I suppose, or the goal for this game. And, it says that *Get Water!* [Reading] "want to get the message out that water is a big deal, and one of the reasons that girls miss out on school." And, I guess as I'm reading that--because I'm annoying--I'm thinking *where*? *Where* do girls miss out on school? But, maybe I'm going to find out in the game.

This point in Candace's think-aloud session is notable for her comment about *where* in the world water scarcity negatively affects girls' access to education. Here, as well as later in the interview, Candace's comments suggest that she is applying particular values in the context of playing this game, particularly *being informed*, and developing a *situated understanding* of the social issues. Candace reiterated these values, among

others, in her responses to the post-play interview questions and the follow-up questionnaire.

After pressing “Play,” Candace’s commentary addressed many topics, including the game’s *playability* (e.g., use of genre conventions, control of the character’s movement, and ease of use), and *aesthetic qualities* (e.g., the pleasantness of the music), as well as her subjective responses (e.g., having fun). However, most of her commentary was focused on how the game design communicated ideas to the player. For example, while viewing the introductory scene in the game, Candace said, “It's really beautiful. I think it's interesting that there's no language there. I think that's really a good choice, like a cool--that the message is shown through the, um, the pictures.” She revisited the use of *nonverbal communication* in the introductory scene during the postplay interview: “I liked that there was no language, really, until the game began […] so often when we describe in film and video, when we describe something other or something different, we still use English because it's for an English consumer. But I like the idea of no ... no talking. I think that that's valid and interesting.” Candace was the only participant of Canadian origin to suggest that the game’s reach might extend internationally.

In the interview, Candace said that she thought that the cutscenes, particularly the introduction to the game, and the “the direct messages—the responses for the other users, the youth”, best reinforced the game’s social agenda. She suggests they play an important function, reminding players of the real-world situation. “Because, otherwise, you could just say, like, I'm just going to get these things, like, those droplets of water, or I have to attack this thing ... I think without the video it wouldn't be as meaningful; you have to get this, and don't touch that!”

Candace was very involved in playing the game, exploring the store, and commenting on her progress as she learned how to play. For example, she exclaimed “Oh! So, I've learned that I can rapid-fire to use the boomerangs, which I didn't realize before.” Unlike some of the other active gamers in this sample, Candace *was* interested in the quotes presented in the game. During the think-aloud session, she read several quotes aloud, and she seemed curious about their sources. For example, when she first encountered a quote, she asked “Is this, like, from

respondents?" The next time a quote was presented, she first read the name associated the quote, then noted "it's a different person this time," before reading the quote aloud. Her interest in the content of the quotes is corroborated by her post-play questionnaire responses, where she responded "Agree" to "The quotes interested me" and "Strongly agree" to "The quotes held my attention."

In the interview, when asked if she felt she learned something from the game, her response illustrates a closer reading of the quote text than is evident in most of the other players' responses:

> Well, each time after I lost […] it would tell me a message from a user of the game, or a teenager, it seemed. And they were saying things like 'Education is important for everyone;' 'To have a good future, you need to go to school. Everyone should have the opportunity to go.' Those are the ones that I noticed. Otherwise, I guess, when you're searching for water, you can get dirty water. I learned that […] I suppose I didn't notice anything that wasn't explicit.

During the interview, Candace reflected on her personal response to the quotes. Her comments suggest a nuanced evaluative process; she critiqued the quotes with respect to the appropriateness and authority of their sources, in relation to their persuasive purpose and the target audience. Her comments, both during the think-aloud session and in the post-play interview, indicate that she had reservations about the ideological content of the texts. For example, during the think-aloud session, she responded directly to the content of one quote, as illustrated by this excerpt from the transcript:

> [Reading] "I support universal access to clean water because water is a basic need, and it's a shame that there's a common belief that only people who have money can or should have access to water."
>
> Is that a common belief? I guess I'm not going to criticize [name]. That's rude.

Candace described conflict that she experienced in her personal responses to the quotes in the post-play interview:

> When I was reading some of the comments, I felt-- I know they're from teenagers,

> and they're not --here's the thing that I was struggling with: when I was playing the game and reading the comments. I was thinking, like, "*Yes*." But sometimes they came out a little paternalistic. Like, "I know the right answer is this, and these characters and their government should be concerned about this, and *clearly* they're not." And to me, that was a little bit, I guess, disconcerting.

However, she also asserted that including personal views from youth in the game's direct messaging was appropriate and could be persuasive to a young audience:

> I guess that, because of my age and the things I believe, they're not telling me anything I don't know […] [but] because that feelings stuff works so well with youth, I don't think it should be scrapped.

She explained that she believed integrating more information about the reality of the social issue would make the social messaging more powerful:

> If I could change those messages, I might add things like numbers, instead of personal responses. But again, I would change, probably, like one of those feelings-type responses and then the next one could be something about, "Here's the real story about this situation." Like, "in the year 2010, this many girls were out of school." I think that that would be helpful … more like feeling, fact, feeling, fact.

Candace suggested that the realism she valued "as a critical thinker" might be in tension with the game's cachet with learners:

> Here's where I'm conflicted. As a critical thinker, I look at this and say, okay, you have to say where you're telling me this is happening, and you have to say a little more to your viewers, learners, players about what's really happening. But then how are you going to get, you know, viewers and players, if it's boring them with the reality?

Candace seemed to conceive of the game from more than one perspective. She noted the participatory opportunities offered by the game, and her comments suggest that she thought those opportunities might serve well as "training wheels" for future participation in

society. We asked Candace what she thought someone naive or young would learn from *Get Water!*, and her answer suggests that she believes young people could gain self-efficacy from their experience: "They would learn that they can have a part in, you know, helping people who are in underprivileged contexts achieve clean water and free education. That they have a part in this. You know? Like, the game makes you feel like your actions help this person, and then maybe they would take that to the next level and think, 'Well, what can I do to help?' I think that that's what they could get from it."

Candace seemed to have a good sense of how she would want to use the game with her students. She said she would "totally advocate people playing this" and that as an educator, she would want to use it to "start a conversation." She also outlined some activities she thought might be worthwhile. Her first suggestion focused on understanding contextual factors that influence the availability of water in the real world. She noted that in her experience of the game, "she's just getting water," and that she would want to address this gap. She said she would ask students to "come up with a solution," and ask then to consider how change would actually occur. She explained:

> I haven't played the whole game, so I don't know what happens, but I hope she gets whatever it is so she gets the water pump for her village […] I would ask students to look at what it takes to make clean water happen in a city. Does education come first, or does the water come first? And I would get students to research, I suppose, ways to do that.

Her second suggested activity seemed more focused on understanding how people communicate about the social world: "I would get [the students] to take a look at messaging about girls in other countries and education. I think that would be worthwhile as well."

**Comparison with Other Cases**

Within the views expressed by the individuals who were most interested in the educational and enrichment applications of the game (i.e., the parents and educators), there were two overlapping perspectives: (1) an experiential learning orientation, and (2) a critical

media literacy view—Marius and Cassandra both focused much more on the richness of the simulation than the game content as expressed in the quotes. The critical media literacy view was expressed to some extent by Marcus, who discussed the *credibility* of the quotes, but moreso by Candace, Ewan, and Michelle, whose discussions largely focused on deconstructing the arguments and assumptions evident in the game's content.

Marius, a university professor in film studies, had a strong interest in games-based learning. His commentary differs from Candace's in that he focused somewhat more on the in-game activities than the other content. His suggestions for improvement were centered largely on the quality of simulation in the game, but he also discussed the game content as expressed in the quotes. In particular, he commented on the source(s) of the quotes, noting that they lacked *credibility* for him as an adult because of lack of authority and support with objective information.

Like Candace, he thought that the game would be useful if a facilitator provided guidance or framing within an instructional unit. He said, "It could probably work […] If it's part of a-a unit or there's a debriefing, then yeah." He thought it would be a good "pre-teaching" activity. Like Candace, and like the parents profiled previously, he believed that the facilitator would need to orient young players:

> I mean, the danger with games is that you just get fixated on what you're trying to do, and so, like, for example, avoiding turtles--it doesn't relate. It's part of the game, but it doesn't relate to the water thing.

He also believed that the narrative could do more to situate Maya's dilemma for the learner; his concern was that the game may be too abstract for a young audience to make meaning of the scenario because they lack prior knowledge:

> Maybe the story has to involve bad guys--the only bad thing [in the game] is bad water. Well, where does bad water come from? Is it from the neighbour next door who didn't want to upgrade his sewer, or, like, why? There's no meaning--bad water, it's like, abstract […] I'm assuming the target age group is probably

> seven to twelve or something. You know, you have different expectations of what they're supposed to get out of it.

Like Cassandra, who wanted the player to "understand the urgency" of the need for water, Marius was particularly concerned that the in-game missions ("assignments") weren't situated well within Maya's reality. He said, that "the [in-game] tasks could be linked to the concept better" and that they weren't presented as accomplishments that Maya herself would be motivated to complete:

> Who cares about mangoes? Unless you say a mango is a source of this-- like, in other words, you've got to plan something--to grow the mango because you need water for that, or you need to wash the mangoes because they're not clean, because they only have pesticide-covered mangoes […] so she has to learn to get water to do something.

Ewan's commentary paralleled Candace and Michelle's commentary more closely—of particular concern to him was that young players would need help to understand the "bigger social structural issues" and that the game would be received "like those World Vision commercials, like, "Oh, poverty is bad!"[…] Just throwing money at [the problem]."

**Vinay: Playing with Personal Experience**

Vinay was selected for a vignette because of how frequently he referred to his personal experiences throughout the study. Vinay was a 23-year-old undergraduate international student from India. For Vinay, the social message was a positive part of the experience. When asked what he enjoyed about the game, he said, "It gives, like, a message for, you know, the people struggling to a small amount of water […] they have to cross many hurdles to get water and all, like in India. I came from India so, like, it's a lot like that." He agreed that the game was a good way to raise awareness of both water scarcity as well as the relationship between girls' access to education and water scarcity.

For Vinay, the game's representation of Maya's character and situation was realistic and relatable. He said that Maya represented "a typical Indian girl, you know, in the villages. Like,

their family [sic] don't support their education much. She has to […] do some household work apart from her studies." He said that Maya reminded him of "Some girls, like, I haven't visited my village, like, since years [sic], like when I was small. I used to see girls, you know, searching for water." Vinay also said that he noticed the setting of the game, and when asked to describe it, he said, "It seems like a slum area, I think. You know, those typical small towns in India."

A notable aspect of Vinay's interview responses is the way in which he retells Maya's story. When asked to explain why he thought the game was realistic in its presentation of the social issue, he said, "Her mother forced her to get water, so she left her studies and went to get some water. So it shows, like, not much interested [sic] to get their, you know, female child to get education [sic]. So that's not good, actually." Vinay's retelling of Maya's narrative differs from the other participants in how he describes Maya's motivation—in his interpretation of the story, Maya's mother is *forcing* Maya to go get the water *and* she doesn't value Maya's education—Maya isn't simply "helping" her mother. This description suggests that he has interpreted the game through a somewhat different lens from some of our other participants, much like Parthiv, who also thought that Maya's mother was forcing her to work instead of attending school. Vinay said that the main message of the game was to "save water." Vinay said that the cutscenes were the most effective parts of the game in terms of the communicating the message, but also notes the dirty water, as well as the more metaphorical fact that Maya must overcome hardship in obtaining water, as he explains that "her mother told her to, you know, get water from that place and while playing the game, she faces those hurdles—those animals, and the negative points she gets by, you know, getting those red ones."

**Comparison with Other Cases**

Shamsher was also from India. Like Vinay, he explicitly highlights the metaphorical implication of the obstacles Maya faces in getting water a strength of the game (in addition to the good/bad water). He said that "getting hit by the peacock and the turtle" was one of the effective ways in which the game communicated its message, explaining that "Getting water—it's like, it should be easy. If, uh, there is maybe a tap or […] a handpump in that area, she can

easily go over there and collect that. But she had to tackle all the hurdles, hurdles in the form of the peacock and the turtles." Similarly, Dev said that the animals showed that all life in the region was being affected by poor access to water.

The four players who had lived in India, Vinay, Shamsher, Jainil and Dev, all agreed that the game was a good way to raise awareness of water scarcity, and all said that the game was about saving water. None of these players expressed concern about the way Maya was drawn. Jainil said he liked how Maya looked, saying she was "properly designed […] like a village girl." They each told the Maya's story in a slightly different way, but all identified her primarily as a member of a slum area or a village—though both Vinay and Dev noted that she was disadvantaged as a female character in particular. Jainil explained that "[the designers] are telling the story of the village. In village, people has to go far [sic] to collect the water […] For the [player], they have to collect as much as water they can [sic]. From the rain and everything. So they are saying you have to reserve the water, rain water." He said that good water management and not wasting water was a "burning issue" right now, and that he had been hearing about it "in the news and everything".

For these players, the game presented an issue that was of pressing importance because, as Shamsher said, "in upcoming days, if this issue which this game is, uh, displaying is not sorted out, then there will be a water crisis, of water all around the world." Shamsher said the game's message was a call for people in India's cities to be aware of the challenges faced by people who live outside the cities:

> [I learned that] those who are having money, those who are living in cities, are enjoying, like, satisfied with their lives. But those who are not having money--our government is not paying extra attention on them because they are only focusing on cities and all the things […] Everyone has a right to education, and she's missing that.

Unlike Vinay, Shamsher was not sure where the game was set, but he also strongly believed that the game was sending an urgent message. He said, "I'm not sure where this is, but I understood—like, many places of Asia, like Bhutan, Nepal, and, uh, Bangladesh—what

they found is that cities are okay. Like, when you go to the villages, there is shortage of the water […] If this continues the day is not far when there will be no water inside Asia because everyone is, just, running short of water. Whether it's China or India."

Shamsher interestingly also offered a different account of Maya's interaction with her teacher in the second cutscene than the educators did. He explained that the cutscene showed the teacher teaching Maya to think creatively about her problems: "… the girl gets the message from his [sic] teacher that you, uh, can tackle the hardship that you are facing, like, not only the way that you are using but also there are some other ways to […] she was only having the stick to throw at the peacock but the teacher just give [sic] her the mask, and goes, like "here is another way that you can use to tackle, tackle your problem."

Asif said that he was "well aware" of the issues involved in getting potable water because "in other cities [in Morocco] it is an issue and people have to go far [to get water]. Asif independently recognized the significance of Maya's gender, explaining that "it has to do with [...] the importance of women in that society that they need to go get water instead of, like, getting educated," but later seemed to question the game's communication about gender roles. He said "Well, on that particular subject, water can affect both women and men. Even men will have to go get water, but in this game it says, like, it's more for women. I'm guessing [their position is] that men will have to go do something else while women have to go get water." Asif was not the only participant who commented that it was not clear what the role of men or boys actually is in Maya's world; Paul, one of the "naysayers", also mentioned this, saying that the mission statement implies "that girls miss out on school more than boys would because the assumption would be that girls are traditionally asked to get the water and boys, I don't know, drink the water?"

**Florence: A Supporter**

Florence was a firm "Supporter" of the game (one of 12 who agreed that the game was an effective way to raise awareness of the target issues). She was one of the players who actually read the description in the App Store, and she also seemed to view the game primarily as an entertainment product, with some persuasive messaging. Her case was interesting

because she clearly brought prior knowledge to the play experience. Her enthusiasm was evident right from the start, and in the end, she said, “I love the way it was marketed […] it’s not just one of those arcade games that is entirely pointless [...] Based on the games that I’ve played—which, you know, are kind of inane, like Angry Birds—it was nice that this one had an actual social message tied to it.” She did not seem to mind that she did not feel she learned something from the game. She said, “They’re issues I was already aware of [… but the game] definitely served as a reminder that they should be paid more attention to.”

Florence was impressed that “there’s actually a message that they’re trying to get across in an entertaining manner. She stated the game’s mission quite accurately in the post-play questionnaire and again in the interviews. She said that the message “was apparent pretty much right away, as soon as the first cutscene played, where she was pulled out of school.” This is reflected in her think-aloud comments. Immediately after the cutscene ended she said, "I think that maybe it's especially poignant that she's a girl being pulled out of school," and then clarified, "just in terms of, you know, universal access to education, it's more often the girls that are pulled out." She said she remembered “there was such a strong look of dismay when she had to be pulled out of school, and I thought that was interesting.” She said that the first cutscene was certainly the most strongest aspect of the game in terms of communicating the game’s message, but she also said that the menu screen “tied in the school theme” because it showed a “sheet of loose-leaf and the pencil.”

As she was playing, she said that the game reminded her of “The Girl Effect,” which is a charitable organization that promotes access to education and opportunity. In the interview, she said that the game seemed realistic “based on what I do know about the issue from The Girl Effect and charity:water—yeah, it seemed about right.” When asked what about the game seemed to correspond to reality, she said “Just the fact that she was being pulled out of school to go get water.” She had no feedback for the gameplay. She said she liked the quotes, and said that she thought “the quotes from teenage kids relates it back to the […] age group it's intended for. 'Cause, you know, it's not quotes from university professors— I guess that having quotes from other kids makes it more relevant. Tries to bring the issue to the kids that they want to play it.” Florence was one of three Supporters to suggest that they wouldn’t really

change anything about the game. She was enthused about it, but did not seem to question whether or not the target audience might need prior knowledge to understand its message. She did not seem to think the gameplay itself corresponded much with reality but she also did not seem to think that was a big deal. The only comment she made concerning the needs of the "teenage kids", whom she identified as the target audience, was that hearing from other kids might be appropriate for them. However, she did not suggest that this choice might also deter adults if no other content were supplied.

**Comparison with Other Cases**

When compared with the educator-Supporter (Candace), Florence, and other supporters such as Tiffany (including 5/6 of the players with personal experience) seemed almost overconfident that the game would indeed promote awareness of the target issues in young people—the argument presented in the mission statement is really quite complex for a novice learner—it is based on a lot of underlying assumptions, the most basic of which are that water is valuable because it is needed for something, and that education is valuable because it is needed for something (perhaps agency or "empowerment"). When Tiffany explained how she imagined using it with her cousins, she positioned herself as someone offering the kids a proverbial spoonful of sugar, to prepare them to learn about what she suggests is a "probably boring" reality. She seemed impressed with the game for pretty much the same reasons that Florence offered. She said, "You don't see a lot of games like this […] You know, games like Angry Birds and Temple Run—[they're] not the most tell-tale of our world and stuff […] Kids nowadays—the reality of it is: you need technology and things to kind of hook them […] I mean, I can see why it won an award. I mean, I'm playing this and I'm having fun, too!"

The less critical supporters for the game seemed satisfied that the game stated values aligned with their own—even if they did not think it demonstrated them in gameplay—and seemed to conceptualize the game as either a new way to promote self-expression, or as a tool that reminds one of civic values rather than as a transformational educational tool. Their suggested learning opportunities focus mainly on reinforcing the very basic assumptions required to understanding the game's mission: they thought that simply stating that water and

education are both valuable, and in some cases, that empowering women is valuable, was good enough for how they thought the product might be used. Raphael *et al*., might position these individuals as people who valued civic training as a use for this product. They seemed satisfied with simply providing a low-key experience that predisposes someone toward a particular value system. For them, fairly simple references to those values seemed to meet their expectations.

In contrast, the Supporters who were more critical of the game seem to start from different assumptions about the goals of a learning activity, as well as the needs of the target learner, and they actually agreed, on most counts, with the "Naysayers' who argued that values might need to be *demonstrated* to be persuasive.

**Rory: A Naysayer**

Rory's case was selected for a "deeper" profile in part because he seemed open to the idea that a video game could be educational, but seemed displeased by the whole experience. He was one of the 3 "Naysayers' who were not also educators, but like all 6 "Naysayers," he disagreed that the game was an effective way to raise awareness of the target issues.

On the one-month follow-up questionnaire, he said that he had discussed the game with a family member because he was "surprised the game won an award because it was not very fun," which suggested a major playability issue for this player. Rory was an infrequent gamer who did not report having played any casual games in the past year, and he was not a mobile gamer. He recognized that the game was a sort of platformer, but based on his self-reported gaming habits, he was probably not familiar with endless runner games as a genre—this may, in part, contribute to his bewilderment during the tutorial at the fact that she seemed to be running over and over again. He verbalized frequently throughout the think-aloud and had a lot to say during the interview. He explored the interface a bit, clicking on the "Story," "Assignments, "Store" and "Tutorial", but did not try the Settings menu. He seemed quite engaged as a research participant, but he really had very little positive to say about the experience. He said "it wasn't something that I naturally enjoyed, which is, I suppose, what a game should be [...] I didn't consider it very fun, which was I consider, like, the base—the

reason for games." However, Rory said, he would be open to "an edifying game—but mostly for video games, I guess, it's just for fun."

Rory's reasons for disliking the game were fairly comprehensive in terms of the variety of content he discussed. He said that the game was repetitive, and the scenery was boring, and the music was "New Age-y." He also said he did not enjoy the direct messaging because he "didn't think anything was that stimulating about the little quotes." However, he did think that the story parts were engaging, "like a little cartoon".

He only saw two of the cutscenes. I asked him to "tell the story" from the cutscenes, and he noted that both of the scenes he saw were "in a school setting," and that in the first one "they were about .kids," but in the second there were "no kids around […] just a middle-aged man, and he seemed pleased to see her […] she found a mask inside of her water carrier, which was a good surprise for her, because she smiled." He said he was more interested in the animated content than the gameplay, which he did not care for, and his descriptions of the scenery and non-player characters were more detailed than most other players.

Though he valued the "story parts," when asked about Maya, he said he did not "relate to her very much. She's just a cartoon figure that doesn't really change." He said that she represented a "disadvantaged" "poor Indian girl." He said that in general "you don't really see much of a reaction from her" or have "many personality traits that I could get out of the game". He later suggested "she seemed to have some determination, […] because she kept going […] as many times as I would put my finger across the screen. She never got tired." He said Maya's motivation was "to get water," and "not get her bucket cracked, get mirrors that will make it rain [the rain jewel item]" and that she might, ultimately, want to "to please, probably, the woman who sent her on this mission," who he guessed was either her teacher or her mother. He identified the setting as India, in a slum area near an urban centre, and said he "thought it was strange because, especially in an area like that, I imagine there would be lots of people.

Rory was definitely aware that the game was "trying to say "something but his comment suggests that he found the messaging lacking somewhat. When asked if he was aware of a social issue in the game, he said "there's limited water […] in some places […] and it causes

health issues and death." He said that his previous statement was prior knowledge, but that he could say what he thought the message was:

> Basically it was trying to say what I just said […] It didn't mention the death part, though. It just mentioned that water is important, but didn't say why, and it also said that education was important, but it didn't say why." When asked if he thought the game made a link between those two concepts, he said, "None that I could see […] just that they were put forward […] There seemed to be a message that people cared about these two issues—education and water—and people should have access to them."

When asked to relate that message to what he saw in the game, he listed the four major mechanics, and said that none of them really connected. He said, "The only goal I could see was that she wanted to get water, avoid peacocks, avoid turtles and avoid rotten mangoes." (Note that he is talking about the "bad" water at this point—there were no rotten mangoes in the game.) His explanation suggests that for him, simply involving water in the core mechanic in the abstract, where having water enables Maya to go to school, was not enough to convey a convincing motive for Maya as a character.

> It didn't seem like I was thinking about her lacking access to water. It seemed like there was lots of water in the game, like, there were tons of water drops, and it didn't seem like a pressing issue for her that she lacked education […] It wasn't like she was […] getting job rejections because she didn't have a high-school degree […] You don't see any of the bad effects [of water scarcity]." He said the only content relevant to education was in the quotes, and that "you could buy pencils for her, or that sort of literate [sic] things like pencils were included as positive symbols."

It is interesting that Rory noted that you could buy pencils in the store, because he never figured out how to use the store. We revisited the store during the interview, and as he explored the interface once more, he explained that he did not know how to use the items because he had thought they were targets or achievements—things that

you could get for more points, not equipment. However, he had tried to buy pencils during the play session. I asked what he thought the result would be. He said that he thought that buying pencils would be a donation to an organization that "helps people get water and education" but "I wouldn't do it myself probably, because it just seems weird to have the game, and like, the money together [… For the study] I just did it because, you know, it's something to do.

Rory brought up a need to care about Maya or people in Maya's situation several times. He explained that he thought a game for people—who, like himself, had prior knowledge--would need more content that enables one to "actually relate to the characters and have more empathy for them […] It doesn't seem like they're real." He suggested that playing Maya should involve doing "what actually happens in life," and noted that the purifying tablets and water filter were realistic objects that he has seen in the game but never used.

Rory gave strongly negative responses for all four questionnaire items regarding engagement with the quotes. In the interview, said the quotes "didn't explain anything" and that "hearing [name] from Montreal who's sixteen said this doesn't really mean anything to me […] she's not an expert on anything […] they were repetitive and they seemed to be obvious." After the first few quotes he "kind of clicked 'Next' because it seemed to be that they all said the same thing […] I might have read them if it was something unexpected [...] Like an interesting statistic." He also suggested jokingly that an anecdote like "My family all died because we drank bad water" might also do the trick to help him care about not having good water, because "then I would be like, "Oh my God! That's horrible. It really does suck to not have good water."

When asked what he would do to change *Get Water!,* Rory said he would want the designers to provide "some more clarity […] I'd be curious to hear, like, why they're doing what they're doing […] because it seems like there's some sort of social purpose, but I don't really see what it is doing […] Are they getting funding from some sort of non-profit organization?" In response, I showed him the mission statement, and he mused, "Maybe they're devoted to getting water instead of getting school … You don't know why water scarcity is leading them to

miss out on school. If she's out there running around, getting water all day, I can understand. Maybe that's, like, typically considered a woman's role." Rory said he had not assumed that Maya's gender was significant in understanding the social issue; he "just thought [Maya] was a female protagonist."

**Comparison with Other Cases**

Rory was not the only player who explicitly reported that he did not assume that Maya's gender was relevant to the water scarcity issue. Both the other "Naysayers" (Paul, Ewan, Veronica, Marius, and Asif) and some "Supporters" (Cassanda, Raluca) said they did not assume that the water scarcity issue was gendered simply because Maya is female, and even though they had some prior knowledge, it was not obvious that this was part of the agenda—as Paul said, Maya was "just a female protagonist." Ewan explained that he asked himself whether or not the Maya's gender was meant to be interpreted as part of the message or not:

> If you asked this question to me, like, a year ago, I don't think I would have been like "Yeah, this is an issue—why a girl?" I would have just gone right off to, they're changing it up to have a female character, or they're trying to target a demographic of women [...] I didn't see her as, like, a voice for women."

Such comments suggest that the game did not communicate its agenda in a transparent fashion—Maya was not explicitly framed as a voice for girls meeting the challenges of water scarcity, and not all players seemed aware that the gender roles depicted (where the teacher was male) might have been significant.

Several other 'naysayers' discussed the credibility or relevance of the quotes to understanding the situation. Marius was another naysayer, although he ultimately recommended the game to a friend because he "enjoyed some parts of the game". Unlike Rory, Marius actually thought that the quotes weren't from real people—he said, "I'm assuming they're probably not really real comments ... It's like it has the appearance of being social media, but it's not, really" and he suggested that the game would be more engaging "if the people interacting were real." When asked to explain, he explicitly references *credibility* in his

critique of the quotes, and, like Rory, suggests that hearing from someone with *authority* or from his personal network would be more effective:

> They're not my friends—they're not really my friends, so I'm not like, "hey, you know, so-and-so said this." It's kind of like comments on the bottom of a website ... [we're] almost accustomed to just get rid of that because it's not our friends ... Like, what's the credibility of these people for me, who have played the game somewhere else, ostensibly? ... I mean, I either like to hear what experts have to say, like David Suzuki […] or also people that I know. My peers, or people I respect for their own reasons.

Three "naysayers" suggested that integration of quotes sharing peoples' authentic experiences of water scarcity was desirable, and that this might have been a missed opportunity and suggested there was a missed opportunity to give *voice* to the people represented in the game. During the think-aloud, Ewan exclaimed, "I guess Washington has a problem with this? But, like, Washington State is different from where the game is taking place. Because last time I checked, Seattle or Tacoma didn't look like that." Veronica explained that "[…]the quotes were all from the U.S., I thought, which was weird to me because I don't care what some sixteen year-old in the U.S. thinks […] I mean, it was about people from that part of the world. I would have loved to see what those people thought too."

**Summary of Key Recommendations from the Player Commentary**

In this section, I present my attempt to summarize and synthesize the player comments about *Get Water!* in more general terms that may serve as useful and testable guidelines in further evaluation efforts.

The suggestions concerning *richness* to support *understanding of complex issues* can be summarized as follows:

1. Increasing the relevance of the activities carried out by non-player characters might help players to more easily identify how the player character's role contrasts with the others.
2. This could be accomplished using playable or nonplayable content, because this type of richness is more likely to be used when the game is used to examine arguments, rather than for unfacilitated exploration of the civic content.

The suggestions concerning *voice* can be summarized as follows:

1. Give Maya a voice (figuratively) so she can communicate greater feedback about how the player's activities affect her life.
2. Give real people who experience water scarcity a voice (figuratively).
3. Give *any* real person or character a voice (literally) so they can hold the player's attention.

The first two suggestions are concerned with representing a broader picture of the real-world scenario and what it means to people who actually experience water scarcity. It is interesting that some players *assumed* that at least some of the quotes actually were feedback from Maya or "mini-stories" about people experiencing the issue (but still did not really read them).

The third suggestion, in contrast, addresses tensions arising from the context—the quotes were "too long" and would not be accessible to "a child who can't read".

The varied views on the quotes are interesting and lead me to wonder whether or not greater transparency about the real source of the quotes would affect the naysayers' views—they were created by students who were learning to exercise their political voices, and might have been

considered more “personally relevant” to the players if presented as participants in the design process rather than “random” people who are simply connected in the game.

The suggestions for improvement concerning *content-mechanic integration* included:

1. Increasing the *functional representational validity* of tools and obstacles to increase *empathy* and to *demonstrate the needs* underlying the game goals.
    a. Some players suggested that this would enhance the credibility of the tool for use with people who have a prior understanding of the basics.
    b. Some players suggested that this would enable players with little prior knowledge to better understand Maya’s situation.
2. Framing the aims of the design more *transparently* to encourage the player to actually look for ways in which the gameplay has *symbolic representational validity*—to help learners without prior knowledge detect metaphorical connections to reality.
3. An enabling condition for supporting *transparency* is effective *multimedia integration*:
    a. Non-playable content that can scaffold understanding of the product’s aims should not be placed in unexpected places or ‘too deep’ in the interface.
    b. Non-playable content that supports the message, but is not relevant to gameplay should not be presented simultaneously with information that *is* relevant to gameplay.
    c. The app store content was not carefully attended to by most players, so reliance on this interface to present framing narratives is inappropriate.

## Chapter 6—Discussion and Conclusions

In this section, I will discuss major findings of this study in terms of their implications for informal and formal learning with digital civic games, and suggest further directions.

### *Get Water!* as a Civic Learning Experience

Was playing *Get Water!* an informal civic educational experience? For these adults, it was not, strictly speaking, an educational experience—the participants' comments suggest that the game was largely perceived to be a reasonably high-quality persuasive media product with a game in it. Although about ¼ of the participants did not believe it would be very effective at communicating its target messages on its own, the majority agreed that it had potential to raise awareness by introducing the concept of water scarcity to individuals with little prior knowledge, or by reminding players of their prior knowledge.

Although for the most part these players did not feel it was educational for themselves *personally*, multiple learning opportunities covering a variety of civic content areas were salient to the players. The key areas for improvement suggested by players included increasing the richness of character development, clarifying Maya's motives for collecting water, increasing the richness of the representation of her community, and increasing the number of in-game activities that seem *functionally representative* of realistic water-gathering challenges.

The vignettes illustrate that players who viewed the game as "not just a game" were sensitive to incoherence or breakdowns in how the game represented reality and presented perspectives by procedural, verbal and visual means, and suggested that the "missed opportunities" might have led to greater *empathy*, *opportunities to think criticality*, or greater *understanding of complex systems.* The participants themselves were able to generate reasonable ways in which to increase coherence between the in-game activities and overall aims of the product, and their comments are supportive of both Raphael *et al.*'s claims that precisely how content is integrated with gameplay affects the salience of that content and how it communicates values.

The players' comments are also compatible with models drawn from the simulation learning literature. The suggestion that providing concrete victory conditions/achievements

might better support empathy for Maya and help players identify correspondences between the game world and reality offers some support for Williams & Williams' (2007) "multiple identification theory" for simulation learning. They further suggest that designers strive to represent reality in a "believable" ways and that post-game debriefing (which, I would argue, is what took place during the post-play interviews) might help players to consolidate their understanding of the correspondences between "game truths" and "real-world truths". In this study, some players reported making new connections during the interview that they had not yet made when they filled out the post-play questionnaire.

The player's understanding of the game's purpose may have been affected somewhat by the specifics of the multimedia design; which in some cases led to misconceptions as to why certain features were present, and in other cases interfered with communication of the message. Given that these players were using an early release of a game developed by a novice design team, it is notable that the game was taken seriously as commercial product.

Based on my personal review of the updated game, it seems likely that version 2.1 (released in 2014) of *Get Water!* would be deemed more educationally appropriate as an informative (and ideally, transformative) text. More facts were integrated, which might increase the credibility and completeness of the information presented about water scarcity. The facts and quotes are no longer presented at the same time as feedback on game progress, which may prove to be more effective in terms of increasing message salience. Additionally, the game's affiliation with a well-known charitable partner is now referenced throughout the interface, particularly in a cutscene that explicitly identifies the charitable partner and shows Maya visiting a friend whose neighborhood has received a new pump. No major changes to the integration of content with game mechanics have been made. The persuasive feature encouraging engagement in further action is now much more appropriate for a school-aged audience in that it encourages players to learn more about starting an awareness project in their own schools.

A key finding regarding the game's potential for use in formal educational settings was that participants who seemed most interested in the game as a tool for learning did not discuss the implications of the fact that some players' own cultural histories might include personal

experiences of water scarcity and its associated problems. This was true of our adult convenience sample, where nearly a third of the participants reported that the topic was personally relevant to them based on their prior experiences, but it is likely that a non-trivial proportion of elementary and secondary school-aged learners in Canada will have personal experience as well. According to Statistics Canada (2008), in 2007, 9% of youth were immigrants, and immigrant youth (under age 25) represented about 1/5 of the population in some metropolitan areas. As the discussion of the experiences of participants with personal experience of the issue illustrated, individuals for whom the social issue addressed has personal relevance may interpret the same game quite differently from a player who must "reach" further to identify with the character. This suggests that the participants' view that the game would function best in a facilitated learning scenario is highly appropriate: because these educators wanted to discuss the issues with their hypothetical learners, it is likely that these learners' personal experiences could become part of the overall learning exercise. That I found this omission from the educators notable should not be taken as a judgment of the participating educators' ability to accommodate multiple cultural perspectives—this study was not an authentic lesson-planning scenario. However it does suggest that for designers validating games with civic content, a relatively short amount of time spent with stakeholders concerned with supporting informal or formal civic learning might not be sufficient to address the needs of a culturally diverse group of learners (e.g., a single play session, plus debriefing and interview).

It is very fortunate that the convenience sample happened to include a relatively high proportion of individuals who could speak to the interpretations that may be more typical of people who have personally experienced water scarcity, particularly in light of how the game ultimately performed abroad. According to reports from the game's analytics service, App Annie, the game was downloaded 4,798 times, primarily in the United States (49%), and Canada (19%). This study took place soon after, in May of 2013. By the end of the first year, it was apparent that the demographics of the actual audience for the game differed from what was assumed by the designers as well as the Civic Gaming research team. The stores in United States and Canada accounted for 18% and 8.7% of the 31, 259 downloads from the first year,

while China and India were the largest audience, accounting for 24% and 21% of downloads, respectively. As of November, 2014, India and Saudi Arabia were the top two countries for downloads, accounting for 21% and 17% of the approximately 90K downloads (Angelique Mannella, personal communication, February 17, 2015). The implication is that civic games researchers really should be mindful that mobile games in particular may have much greater reach than anticipated. Researchers should consider how to best account for diversity in the participant pool, as well as how some learning outcomes, particularly values and social norms, may be more or less relevant or salient to some players depending on their cultural experiences.

Raphael *et al*. argued that for civic games to be educationally effective, procedural literacy, as a special case of media literacy, must be developed in the general audience. The results of this study suggest that many of these adult players *were* practicing this literacy—they were able to discuss this casual game in terms of its procedural arguments, even for a game that made relatively little use of this form of argumentation to communicate its message. They noted when such arguments lacked functional or symbolic representational validity, as well as when they conflicted with the framing narrative drawn from the metagame content, and made reasonable conjectures about how these would affect the player experience.

Raphael *et al*. further suggests that games that encourage players to choose between multiple goals are more likely to inspire ethical reasoning than games that offer a single, defined goal—*Get Water!* actually did that as an interactive application as a whole, and not really through its gameplay—because players that encountered it began to reason about *why* they would play "for a cause". This suggests that the Civic Games-based Learning framework's focus on rules, roles and goals could be improved in part by stipulating that the representational validity of the 'rules' and 'roles' be validated and documented in a systematic way, but also by incorporating a complementary means of systematically examining the influence of the context of use (including design norms for the genre of game and platform), for it to be maximally valuable in guiding more rigorous evaluations of such experiences.

To conclude, the perspectives documented in this study speak to the potential opportunities, limitations, and even hazards of the use of mobile video games to educate the

public about complex social issues. This case study illustrates the many ways in which individuals may approach, perceive and evaluate the same game design and come away with interpretations that in some cases depart from the designers' expectations and intentions. It demonstrates the value of the auditing process in identifying specific conflicts between values and goals that were privileged in the design, as well as the target actions desired and indeed expected by a subset of the tool's potential users. The data collection methods used in this study were modelled on commonly used play-testing methods and user-centred design practice, which proved useful as a mean of verification of the design. Though *Get Water!* does not seem to have achieved a high level of verifiability, it is instructive in its shortcomings, and we have obtained both tentative evidence supporting the assertion that it succeeds to some extent as a means of raising awareness, and testable hypotheses about how the game may perform in an educational validation study. Further research is required to obtain a rigorous assessment of the educational validity of this extent to which *Get Water!* can affect attitudes, knowledge, and behaviours, for which learning objectives, for which players, and under what conditions.

**Limitations of the Findings**

This research focuses on characterizing player experiences of a game with a social message; it is inevitable that participants' observations and reflections, as well as my interpretations as a researcher, will be somewhat contextually bound in terms of cultural experiences of the people involved, and the affordances and limitations of this particular game. Potential relationships between player responses and game elements identified in this research may not hold for other games of change, or for other players.

A major limitation of this research is that the initial pool of participants from which my sample is drawn is a small self-selected group recruited in a university setting, and so are likely to be drawn from a relatively narrow range in terms of socioeconomic status and education level. Gender parity was also not achieved in that initial pool, although games of this genre are reportedly slightly more popular with women than men. These limitations based on the initial sampling strategy may result in the exclusion of theoretically interesting player perspectives.

For all of the reasons above, the findings of this study should not be generalized to the general population of potential adult players.

The laboratory setting and the fact that participants are specifically being asked to reflect on specific elements of the game means that their self-reports may not be representative of what the participant might say or do in a more naturalistic setting, or in a less contrived social context of play. Nielsen, Clemmensen, & Yssing (2002) note that participants often fall silent when they find the task difficult, and that participants often cannot speak as quickly as they think. They also argue that the information participants provide during think-aloud are only accurate accounts of cognitive processes when the triggering stimuli are particularly salient, and that all other commentary stems from introspection. Reflecting participants' internal and implicit causal theories about what triggered their thoughts or judgments are likely to reflect explicit and implicit social and cultural norms. These limitations are perfectly acceptable in the context of this study, as my objectives were to identify salient features, and to gain insight into which norms influence the participants' subjective judgments both in the moment, and retrospectively. For this study, the follow-up interview serves as an opportunity to clarify comments participants made during the think-aloud.

However, this research is intended simply to characterize a range of player experiences and explore potential causal mechanisms within the process by which players understand and evaluate a game, rather than to make predictions about how *all* players in a given population or subpopulation would interact with or evaluate it. The particular cases described may well be atypical in terms of their personal histories. Each participant profiled in greater detail was purposefully selected based on the researcher's ad hoc conceptualization of the perspective that individual could exemplify, and therefore despite certain commonalities across cases, the findings documented also should not be generalized to all members of the subgroups described. Although some participants took the opportunity to comment on my research findings, not all could be reached and not all were interested in providing feedback; the participants themselves might not identify with the perspectives I described and might contextualize their particular cases in a different way. The particular approach I have taken to

documenting, summarizing, and interpreting the data necessarily reduced the depth of insight into particular players' experiences that a study of fewer cases could provide.

In sum, the results of this research should be carefully considered within the interpretive nature of the qualitative approach, the cultural and research context in which the findings emerged, and the unique histories of the individuals who took part in the study.

**Recommendations for Future Research**

This section presents my recommendations for further exploration of the player experience of video games with civic or social justice content. It is my opinion that this area of research, and the area of games-based learning in general, is fertile ground for future inquiry. I will first present unresolved research problems and questions, followed by recommendations for conducting empirical research in this area.

***Recommendations for research on civic games.*** I believe that researchers interested in civic games may benefit from attempting to incorporate terms from the established simulation games literature to expand our analytics frameworks. I also recommend that researchers keep an open mind as to what can be learned from studying games that were not designed according to the prescriptive norms currently popular in the literature.

For this game, the connections between playable and non-playable content, as well as correspondence to reality, and transparency issues, specific to the implementation of the game concept on a particular platform and genre, seemed quite relevant to understanding how players made meaning of the experience. Although I agree with the view expressed by Raphael et al. (2010) that rigorously controlled trials for civic games can and should be conducted, I am of the opinion that such evaluation efforts may only be worth doing if preceded by a thorough investigation of what a particular game is best suited for. It seems unlikely that researchers running large controlled trials would gain much insight into the mechanisms by which change occurred if it is not preceded by a verification-focused evaluative process. A crucial take-away from this study is that even a relatively simple game can communicate a message on multiple interacting levels, not all of which are salient, and that player interpretations can depart markedly from both the designer and the researcher's expectations.

This case in particular demonstrated that our assumptions that this game would basically only be played by a Western audience were incorrect; this game performed far better in countries outside of North America than was anticipated, and therefore a less diverse sample would have failed to capture any views that might be representative of people who are most likely to play the game. The opportunity to explore how it might be interpreted by people with varied cultural experiences was valuable and fortunate, and further research into how civic games communicate interculturally, particularly for games distributed in a global marketplace, definitely seems warranted.

***Recommendations for the adoption of commercial games for civic or social studies.***

Some key take-aways regarding the adoption of commercial games for use in learning activities include the following:

1. Commercially available games marketed for educational purposes may not have been verified for that purpose, and endorsements from prominent organizations do not necessarily imply the game has been verified "in the field."
2. Curriculum designers intending to integrate a particular game into an educational program may wish to run a pilot test to document unanswered questions and misconceptions elicited by the game, and set instructor expectations as to prerequisite knowledge that may be required to decode the game. This information could be used to generate prebriefing and debriefing materials that better reflect the learning opportunities presented by the particular game in question.
3. Educators considering a game to use in a class could probably benefit from the use of a casual game (because they are short), but should, if possible, run through the game and carefully consider whether or not a particular game is better suited for use as a text to analyze, or as a more exploratory or experiential learning activity. Framing the objectives of the gameplay activity in those terms might benefit some individuals who might not otherwise attend to non-playable content (many of our adult players did not), or who might otherwise dismiss playing the game as a "waste of time."

***Recommendations for research practice in civic game-based learning.*** Below, I have compiled a number of lessons learned for researchers interested in developing a deep understanding of the design and experience of games with civic themes or a social justice agenda. I believe that following these practices may both enhance the integrity of the data collected but also facilitate in translating findings into actionable recommendations for fellow researchers, game designers, and educators.

1. If possible, develop a relationship with the game's creators for insight into the project context and design choices that were made but perhaps not made explicit in written documentation. This will enable you, as the researcher, to acknowledge and reflect on the designer's motivations and constraints—these may not be obvious to an outsider, or even as a player.
2. Relating to point 1, establish clear expectations with the creators regarding the purpose of your investigation, how requested documents will be used, and your commitments with regard to maintaining scholarly integrity. This research project was conducted on an arms-length basis, to avoid interference with an unrelated and concurrently conducted ethnographic study. If a researcher intends instead to contribute to a partnership of some kind (e.g., participatory design, development, and/or promotion of a particular game), then the researchers' relationship with participants and even research methods should be tailored to transparently reflect that shared agenda instead.
3. Be aware that participants who do not themselves conduct research need to be provided with a clear and frequently reinforced description of your role as a researcher. If you are not involved in the design of the game, be mindful that participants may not retain an understanding of your role as a researcher and influence on the game's developers, given the consent documents and the scripted oral pre-briefing alone. The concept of conducting research on a game for its educational effectiveness and not for the purpose of user testing in iterative design is somewhat foreign to a typical participant, who may draw incorrect conclusions based on the non-trivial similarities between commonly used research methods (such as satisfaction questionnaires and

think-aloud procedures) and the methods used for user testing in game development contexts. Consider obtaining oral confirmation of the participants' understanding, and clarifying and reinforcing the aims of the research through dialogue as part of the study's pre-briefing process.

4. Following from recommendation 3, frequently reassure participants that their honest opinions are helpful and desirable data, and develop probing questions to encourage reluctant participants to share negative aspects of their experiences more openly. Participants may be particularly prone to self-censoring their critiques of the game's ideological content or approach of a game with a social justice mission, when that mission seems aligned with their own values. A probing question that I found useful for this purpose was to ask participants, "What do you think the game/designers could do better?"
5. Develop or select a model for think-aloud responses that demonstrates for the participant the kind of information that interests you, to encourage less outgoing participants to report more of their thoughts and observations without resorting to continual prompting throughout the session. A video-taped or audio-recorded exemplar would present a consistent model response to all participants, and may encourage participants to volunteer richer description, rather than a simple account of the operations they are completing at a given time.
6. Carefully explore and document where information is provided, and if available, consult the game's design documents to enable you to interview the participants about observed interactions with content elements that they may not comment on themselves during the think-aloud. This procedure may reveal insight into the participants' decision-making processes as they explore the game application. Do not assume that all players of a video game will be exposed to the same content (even if it is brief or 'casual' in design), particularly if a content element communicating particular learning objectives is "optional viewing" within the interface. Participants may find it easier to actually revisit particular scenes and screens when providing retrospective commentary so they can point at the screen.

7. The development of vignettes can be a useful step in the analysis of player reports of their experiences. I did not initially plan to include vignettes, but the process of constructing them enabled me to develop an understanding of the dynamics of the player-game system in context and draw potentially actionable insights as to where disconnects between *Get Water!*'s functionality and the players' expectations were occurring, and for whom.
8. Member-checking with participants who express philosophical and ideological concerns, such as participating educators, is essential to understanding the particular connotations individuals ascribe to words. As educators familiar with different paradigms of teaching and learning may use the same words (e.g., reflection, awareness) to denote substantively different processes or outcomes.

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## Appendices

### Appendix A—Consent form

**CONSENT TO PARTICIPATE IN RESEARCH**

I understand that I am agreeing to participate in research being done by David I. Waddington, Vivek Venkatesh, and Ann-Louise Davidson of the Department of Education of Concordia University.

Phone: 514-848-2424x2039

E-mail: dwadding@education.concordia.ca

**A. Purpose**

I understand that the purpose of this research is to evaluate how certain descriptions and representations of global development issues affect learning.

**B. Procedures**

I understand that if I agree to participate, I will participate in the following activities:

**Laboratory Session**

I understand that I will play a videogame for approximately 20 minutes. During the game, I will be presented with several brief texts concerning global development issues. I will be asked to speak aloud any thoughts or observations I have during gameplay. I understand that the gameplay session will be audio-recorded to document my comments.

I understand that I will be asked to complete questionnaires before and after the activity, and I will be asked to complete a short, 20 minute interview. I will receive $20 in cash after having played the game, completed the questionnaire, and completed the interview. I understand that completing the laboratory session will require about 60 minutes of my time.

I understand that I will be given instructions that will allow me to download, if I wish, the videogame I have played in the laboratory. This download will be free.

**Follow-up web questionnaire**

I understand that I will be contacted by the research assistant by email to complete a questionnaire one month after completing the play session about my experiences during the study, and that this questionnaire should take about 5 minutes to complete. I understand that I will receive compensation of a $5 gift card if I participate in the follow-up questionnaire.

**C. Risks and benefits**

I understand that there are no foreseen risks involved in participating in this study.

**D. Conditions of Participation**

I understand that I can take back my consent and leave this study at any time, and that I will still receive full compensation for my participation regardless of whether I complete the experiment. I understand that if I withdraw from the study, all data that I contributed will be destroyed.

I understand that I am free to withdraw from the study until two weeks after the e-mail questionnaire is complete.

I understand that my participation in this study is confidential. This means that the researchers will know who I am, but they will not reveal my name to anyone. The only people who will have access to the data are the members of the research team (Dr. Waddington, Dr. Davidson, and Dr. Venkatesh) and the research assistants working on the project. Only the members of this team will know my identity, and my name will never be used in any publications.

I understand that the information from this study, including non-attributed quotes from interviews, may be published in journal articles, conference papers, and papers on the authors' websites.

I understand that by signing this form, I do not waive my right to take legal action against the researchers in the event of research-related harm.

I understand that I can contact Dr. David Waddington (dwadding@education.concordia.ca) if (after the experiment is complete) I have questions about the scientific aspects of this research.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print)

_____

SIGNATURE

If, at any time, you have questions about your rights as a person who is taking part in this research, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at 514-848-2424x7481 or by email at areid@alcor.concordia.ca.

**Appendix B—Recruitment Handout**

**Are you a Concordia student?**

**We invite you to participate in a study about casual gaming!**

Time required:

Approximately one hour in a laboratory session and ten minutes for a follow-up online questionnaire.

Compensation provided: $20 for lab session and $5 for online questionnaire.

This study is conducted by Drs. David Waddington, Ann-Louise Davidson, and Vivek Venkatesh of the Concordia University Department of Education.

Please fill out a screening form if you are interested in participating.

**Appendix C—Screening Questionnaire**

Please fill out the following screening form. Data on this form are for screening purposes only and will be destroyed once participants are selected for the study.

**Name:** _____

**Age:** _____

**E-mail:** _____

**Have you ever suffered from photosensitive seizures or do you require special adaptations to see computer screens?**

_____Yes _____No

**Have you ever heard of this game?**


_____Yes _____No

**Appendix D—Participant Profile Questionnaire**

**Part I—Personal Information**

**Name:** _____

**Email:** _____

**Age:** _____ **Gender:**_____

**Part II—Video game habits**

I play video games (select the **one** response which most applies to you):

_____ Almost every day _____ Several times per week

_____ Several times per month _____ Around once per month

_____ A couple times per year

I tend to play video games (select the **one** response which most applies to you):

_____ Alone _____With my friends in the same room

_____ With my friends online

How many hours per week do you spend playing video games? _____

In the past year, I have played the following types of games (check all that apply):

( ) First-person shooters (e.g. Call of Duty)

( ) Other shooter (e.g. Metal Gear Solid)

( ) Puzzle (e.g. Professor Layton)

( ) Role Playing (e.g. Mass Effect, Dragon Wars)

( ) MMORPG (e.g. World of Warcraft)

( ) Real-time Strategy (e.g. Starcraft II)

( ) Turn-based Strategy (e.g. Civilization V)

( ) Adventure (e.g. Monkey Island)

( ) Rhythm/Music (e.g. Rock Band, Singstar)

( ) Party Games (e.g. Ravin' Rabbids, Warioware)

( ) Card Games (e.g. Hearts, Solitaire)

( ) Flight Combat Simulations (IL-2 Sturmovik)

( ) Life Simulations (e.g. The Sims, SimCity)

( ) Racing (e.g. Need for Speed)

( ) Casual (e.g. Angry Birds, Tetris, Peggle)

( ) Sports (e.g. NHL 2K10)

( ) Arcade/Platformers (e.g. Super Smash Bros., Mario Bros.)

Do you own a smartphone, tablet or personal digital assistant?

___ Yes ___ No

Which of the following devices do you own?

( ) iPhone/iPad

( ) Android

( ) Blackberry

( ) Nokia

If you own an iPad/iPhone, how often do you carry it?

( ) Never ( ) Only when travelling ( ) Only when going to work/school ( ) Every time I go out

Do you share your iPad/iPhone with at least one other person?

( ) Yes ( ) No

How many mobile games have you downloaded in the past 6 months?

How many games do you have installed on your mobile device?

How many of the games installed on your device do you play regularly?

Please list any mobile games that you play.

_____

**Appendix E—Think-Aloud Facilitation Script**

| Script | Researcher comment |
|---|---|
| "We are interested in how the features of the game influence the player experience.<br>While you're playing the game, I'd like for you tell me about any thoughts or feelings you have. Say everything that goes through your mind as you play. For example, if you find something interesting in the game, say so out loud. Feel free to explore the screens in the game. If you stop talking, I'll remind you to continue. | *The phrasing is general and intended to explain the intent and process of the exercise.* |
| We'd like to remind you that this research is not being conducted on behalf of the game developer. | *We found in pilot-testing that participants assumed that the game was being studied on behalf of the developer rather than for the purposes of education research. This phrasing is intended to correct that potentially biasing misconception.* |
| Please don't feel self-conscious about what you say. We are not interested in how high your score is, nor your performance in the game. We're interested in your honest opinions about the game and how you experience it, and only the research team will ever listen to this recording. | *This phrasing was intended to assure participants that their performance would not be judged, and that any embarrassing or socially unacceptable comments they shared during the playtest would remain confidential (cursing aloud was a frequent occurrence during gameplay).* |

| | |
|---|---|
| Do you have any questions?<br>I'm going to start recording now. | |
| *Researcher gives the participant the iPad, with the App store open.*<br><br>This is how the game looks in the App store. The game is already installed on the iPad, but please feel free to look around the description and share any thoughts or comments you have.<br><br>Are you ready to play?<br><br>*The researcher opens the Home screen of the iPad and returns it to the participant, who launches the application.* | |
| *During play, offer neutral prompts:*<br>• Keep talking.<br>• Keep thinking aloud.<br>• What is that?<br>• What's going on now?<br>• What's happening? | *The latter three prompts were process-focused so that the researcher could respond to events in the game or participants' facial expressions and behaviors.* |

**Appendix F—Questions from the in-Game Experience Questionnaire (iGEQ)**

*Note. These items are taken from the In-Game Experience Questionnaire (iGEQ) (IJsselsteijn et al., 2008). Participants responded on a 5-point Likert scale (0=not at all, 1=slightly, 2=moderately, 3=fairly, 4=extremely).*

In-Game Experience Questionnaire

***The following questions are about the experience you had playing the game.***

1. I was interested in the game's story
2. I felt successful
3. I felt bored
4. I found it impressive
5. I forgot everything around me
6. I felt frustrated
7. I found it tiresome
8. I felt irritable
9. I felt skillful
10. I felt completely absorbed
11. I felt content
12. I felt challenged
13. I felt stimulated
14. I felt good

**Appendix G—Post-play Questionnaire**

***Please indicate your level of agreement with each of the following statements.***

I would play this game again

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

I will download this game

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

I will recommend this game to someone

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

***Was there a social message in the game that you played?***

( ) Yes ( ) No

If yes, what was it?

***Please rate your level of agreement with each of the following statements.***

This game is an effective way to promote awareness of water scarcity.

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

This game is an effective way to promote awareness of the relationship between access to clean water and girls' access to education.

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

***Thinking about the quotes you read while playing the game, please rate your agreement with the following statements.***

I enjoyed reading the quotes.

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

I found the quotes boring.

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

The quotes interested me.

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

The quotes held my attention.

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

**Was there a social message in the anecdotes that you read?**

( ) Yes ( ) No

If yes, what was it? _____

***Please rate your level of agreement with the following statement.***

**I am interested in learning more about water scarcity.**

( ) Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree

**Part III—Civic Engagement**

*These items are taken from the community problem solving and political voice sections of the Bonner civic engagement questionnaire developed by the The Center for Information & Research on Civic Learning & Engagement (2006).*

1. Have you ever worked together with someone or some group to solve a problem in the community where you live?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

2. Have you volunteered or done any voluntary community service for no pay?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

**Indicate whether you have volunteered with any of the following types of organizations or groups:**

2A. Religious group

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

2B. Environmental organization

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

2C. Civic or community organization involved in health or social services

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

2D. An organization for youth, children, or education

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

2E. Any other group (describe the group) _____

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

3A. Do you belong to or donate money to any groups or associations, either locally or nationally such as charities, labor unions, professional associations, political or social groups, sports or youth groups, and so forth?

( ) Yes ( ) No

3B. Are you an active member of this group or any of these groups, a member but not active, or have you given money only? Mark all that apply.

( ) Active member of at least one of them

( ) Member, but not active in at least one of them

( ) Given money only

( ) No

4. Have you personally walked, ran, or bicycled for a charitable cause–this is separate from sponsoring or giving money to this type of event?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

5. Besides donating money, have you ever done anything else to help raise money for a charitable cause?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

**Have you done any of the following to express your views?**

6. Contacted or visited a public official–at any level of government–to express your opinion?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

7. Contacted a newspaper or magazine to express your opinion on an issue?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

8. Called in to a radio or television talk show to express your opinion on a political issue, even if

you did not get on the air?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

9. Taken part in a protest, march, or demonstration?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

10. Signed an e-mail petition about a social or political issue?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

11. Have you ever signed a written petition about a political or social issue?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

12. Have you ever NOT bought something from a certain company because you disagree with the social or political values of the company that produces it?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

13. Have you bought something because you like the social or political values of the company that produces or provides it?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

14. Have you worked as a canvasser–going door to door for a political or social group or candidate?

( ) Yes, within the last 12 months ( ) Yes, but not within the last 12 months ( ) No, never

**Appendix H—Interview Questions**

The following series of questions will be posed individually to each participant.

1. How did you feel about playing Get Water!?

- Did you enjoy your experience? Why or why not?
- Would you play the game again? Why or why not?

2. Were you aware of a social issue in Get Water!?

- If so, what was the issue?

3. Were you aware of a particular message in Get Water!? If so, what was the message?

4. What did you think of the main character in Get Water!?

- What do you think Maya represents? What does her character mean?

5. Were you aware of the background/setting in the game?

6. What did you think happened in the movie cutscenes?

7. Were there aspects of the game that were really effective in communicating the game's message? If so, which ones? [Movie cutscenes? Quotes?]

8. Do you feel that you learned something from Get Water?

9. Do you think that the game was realistic in terms of how it presented a social issue?

10. Do you think of Get Water! as being different from typical video games? If so, how?

11. If the company hired you tomorrow to suggest changes to this game, what would you want to change?

**Appendix I—Follow-up Questionnaire**

1.1 If you have one, did you download the game Get Water! to your personal iOS device?

[yes, no, n/a]

If yes,

2.1 Did you play the game in the last month?

If yes,

2.2 How frequently did you play the game in the last month?

[never, once per week or less, 2-3 per week, once per day, several times per day]

2.3 Where did you play the game? Please select all that apply.

[at home, while taking transit, at school, at work, other (please specify)]

2.4 Who did you play the game with? Please select all that apply.

[alone, with a friend, with a family member, other (please specify)]

If no, continue to 1.2.

1.2 Since participating in the play session, did you discuss the game with anyone?

1.2 a.[yes, no]

1.2 b. Why or why not?

1.2 c. What did you discuss? With whom?

1.3 Since participating in the play session, did you try to learn more about water scarcity, access to education, or any other global development issues?

1.3 a.[yes, no]

If yes, continue to 1.3b.

1.3 b. Why or why not?

1.4 How did you try to learn more about these issues?

**Appendix J—Debriefing letter**

The purpose of the project that you have just participated in is to investigate the effect of a casual mobile game (*Get Water!*) upon attitudes toward water scarcity and its impact on girls' education as a global development issue. Our hypothesis is that playing this videogame may prompt changes in attitudes toward this issue.

You may have noticed that a small omission was necessary on the consent form—you were not told the precise nature of the game in advance, nor were you informed as to the precise purpose of the study. This was done in order to avoid biasing the subsequent results of the study.

As a participant, you may be interested to find out the results of the research in which you participated. Please rest assured that any published results of this experiment will be publicized on the websites of the principal investigators. The relevant web addresses are as follows:

David Waddington:
http://doe.concordia.ca/Faculty/?page=faculty_list&categoryid=7&facultyid=36

Vivek Venkatesh:
http://education.concordia.ca/~vivek.venkatesh/HomePage/CV

Ann-Louise Davidson:
http://doe.concordia.ca/Faculty/?page=faculty_list&categoryid=7&facultyid=31

Thanks again for your participation. Your generous time contribution has helped facilitate the development of our research, and we sincerely appreciate it. Please feel free to contact us at

dwadding@education.concordia.ca if you have any questions about the research.

**Appendix K—Scoring Guidelines for the In-game Experience Questionnaire**

The In-Game module of the Gaming Experience Questionnaire (IJsselsteijn *et al*., 2008) measures 7 components, where each component is represented by two items. Scores for each component are calculated as the average of the items.

Competence: Items 2& 9.

Sensory and Imaginative Immersion: Items 1& 4.

Flow: Items 5 &10

Annoyance: Items 6 & 8.

Challenge: Items 12 & 3.

Negative Affect: Items 3 & 7.

Positive affect: Items 1 & 4.

| Item # | iGEQ item | Factor |
|---|---|---|
| 13 | I felt stimulated | Challenge |
| 12 | I felt challenged | Challenge |
| 9 | I felt skilful | Competence |
| 2 | I felt successful | Competence |
| 10 | I felt completely absorbed | Flow |
| 5 | I forgot everything around me | Flow |
| 7 | I found it tiresome | Negative affect |
| 3 | I felt bored | Negative affect |

| | | |
|---|---|---|
| 11 | I felt content | Positive affect |
| 14 | I felt good | Positive affect |
| 1 | I was interested in the game's story | Sensory and Imaginative Immersion |
| 4 | I found it impressive | Sensory and Imaginative Immersion |
| 8 | I felt irritable | Tension |
| 6 | I felt frustrated | Tension |

Appendix L—Description of Interface elements

*Interface elements in Get Water! v.1.1 for iOS*

| Location | Interface element |
|---|---|
| Apple App Store | *Details* tab<br>This tab presented a general description of the game written by Decode Global staff, which included the following information:<br>• Game genre (endless runner),<br>• UNESCO award-winning game,<br>• Premise (getting water enables Maya to go to school) ,<br>• Setting (India),<br>• Developer name (Decode Global) |
| | *Reviews and Ratings* tab<br>This tab presented recent reviews and ratings submitted by App Store users. |
| | *Related* tab<br>This tab was blank at the time the playtest was conducted. |
| Home Screen | *Facebook icon*<br>The Facebook icon linked to the *Get Water!* Facebook fan page. |
| | *Twitter icon*<br>The Twitter icon linked to the *Get Water!* Twitter profile. |
| | *? icon (Tutorial)*<br>Tapping this icon launched the tutorial that was automatically presented the first time the player launches the gameplay. The tutorial introduced the swiping gesture required to move Maya, and the boomerang used to deter peacocks. |
| | *Gear icon (Settings)*<br>Tapping this icon revealed the following options:<br>• Sound on/off |

| | |
|---|---|
| | • Music on/off<br>• About<br>The “About” screen featured the game’s mission statement, and the names of the members of the development team. |
| | *Pencil icon (Store)*<br>The store contained upgrades – these were skills or skill-enhancing items that could be purchased using pencils earned by meeting in-game objectives, and pencils (donations) that could be purchased using money. |
| | *Story*<br>Tapping this icon opened a screen showing all unlocked storylet animations. Initially, the introductory video that is automatically presented on a player’s first run is the only playable animation. |
| | *Gradebook icon (Assignments)*<br>Tapping this icon opened a screen listing in-game objectives. |
| | *Arrow icon (Start)*<br>Tapping this icon launches gameplay. |

**Appendix M—Cutscene Content**

*Summary of narrative events drawn from a design document for Get Water! v.1.0*

| *Cutscene* | *Water collection goal* | *Equipment unlocked* | *Description* |
|---|---|---|---|
| Introduction | . | . | Maya is seated at school. Her mother comes to the door to get her because waterpump has broken. Maya has to go collect water. She sets off with a determined look on her face. |
| Chapter 1: Crafty skills | 2,000 water drops | "Scary Mask" | Maya runs back to school with her broken pot. She tells her science teacher that a peacock broke her pot. Her teacher shows her how to make a mask to scare them away. |
| Chapter 2: Turtle jumper | 3,000 water drops | "Turtle Gymnastics" | Maya's pot is broken. She looks defeated. A boy from class is jumping on rocks in the river. This gives her the idea to try jumping on the turtles |
| Chapter 3: Unexpected help | 4,000 water drops | "Waterpot Shell" | Maya's pot is broken by a football some boys are playing with. They help her create a protective covering for her pot. |
| Chapter 4: Boomerang Tricks | 5,000 water drops | "Rapid-fire Boomerang" | Maya sees girls from her class having trouble with peacocks, and shows them how to use boomerangs. She thinks of throwing many at a time. |

| | | | |
|---|---|---|---|
| Chapter 5: Science! | 6,000 water drops | "Purification tablets" | Amount of dirty water increases for some reason, or amount of clean water decreases. The boys realise how this will affect the girls and want to help. They find Maya and take her to the teacher who gives her some water purification tablets and says she'll get more if she studies hard. |
| Chapter 6: Book smart | 7,000 water drops | "Fancy filter" | Maya does homework in her room, her mom walks in and gives her a book about water filtration. Maya is excited and starts reading the book until she falls asleep and dreams about filtration. |
| Chapter 7: Hidden Treasure | 8,000 water drops | "Water magnet" | Maya is running with the pot, trips on something, digs it out, notices the object's ability to attract water, and takes it with her. |
| Chapter 8: Upgraded | 9,000 water drops | "Sonic Boomerang" | Maya goes to show teacher the books she's read, teacher has a gift for her. The teacher attaches a noise making device to Maya's boomerang that scares away animals. |
| Chapter 9: Finale | 10,000 water drops | Unlock endless runner mode, reset story mode. | Maya and other girls run back to school together, scaring away peacocks and jumping on turtles. Maya, the girls, and the boys from before come out of the school. Maya waves goodbye and returns home. Later that evening, the teacher comes to Maya's house with lots of ragged looking books on water filtration, plumbing, etc. He gives them to Maya and she looks pleased. |

**Appendix N—Educational Profile of the Sample**

*Table N.1 University Degree Attainment and student status.*

| | Level of education | | | |
|---|---|---|---|---|
| | Bachelor | Master | Doctoral | Total |
| Students (degree in progress) | 11 | 7 | 1 | 19 |
| Non-student | 1 | 1 | | 2 |

*Table N.2 Subject Matter Studied*

| Discipline | Count * | Examples |
|---|---|---|
| Social sciences | 8 | political science, human relations, education, educational technology |
| Humanities | 8 | liberal arts, journalism, music, film studies, cultural studies, language studies |
| Engineering | 7 | civil, electrical and computer, industrial, mechanical |
| Business | 1 | accounting |

*Some participants reported having completed studies in more than one discipline.

**Appendix O—Gaming Profile of the Sample**

| | Reported playing an endless runner game? | | |
|---|---|---|---|
| Gamer group | No | Yes | Total |
| High frequency (plays almost every day or several times per week) | ***3*** | ***8*** | ***11*** |
| Casual only | 1 | 1 | 2 |
| Generalist | 2 | 6 | 8 |
| Non-casual only | | 1 | 1 |
| Medium frequency (plays several times per month) | ***2*** | ***1*** | ***3*** |
| Generalist | 2 | 2 | 4 |
| Low frequency (plays a few times per year) | ***3*** | ***1*** | ***4*** |
| Casual only | 2 | | 2 |
| Generalist | 1 | 1 | 2 |
| Non-casual only | 1 | | 1 |
| | Total | 10 | |

*Note. The participants are grouped by their reported "games played" in the last year.*

**Appendix P—Civic Engagement Profile for the Sample.**

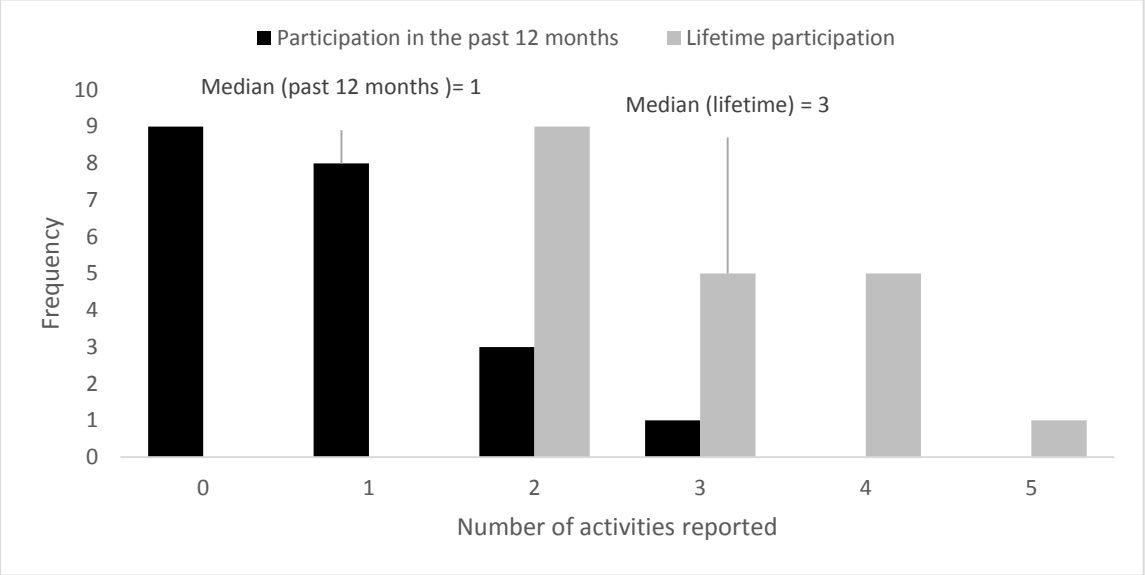



*Figure P.1.* Number of civic behaviours reported in the past 12 months, and at any time in the past.

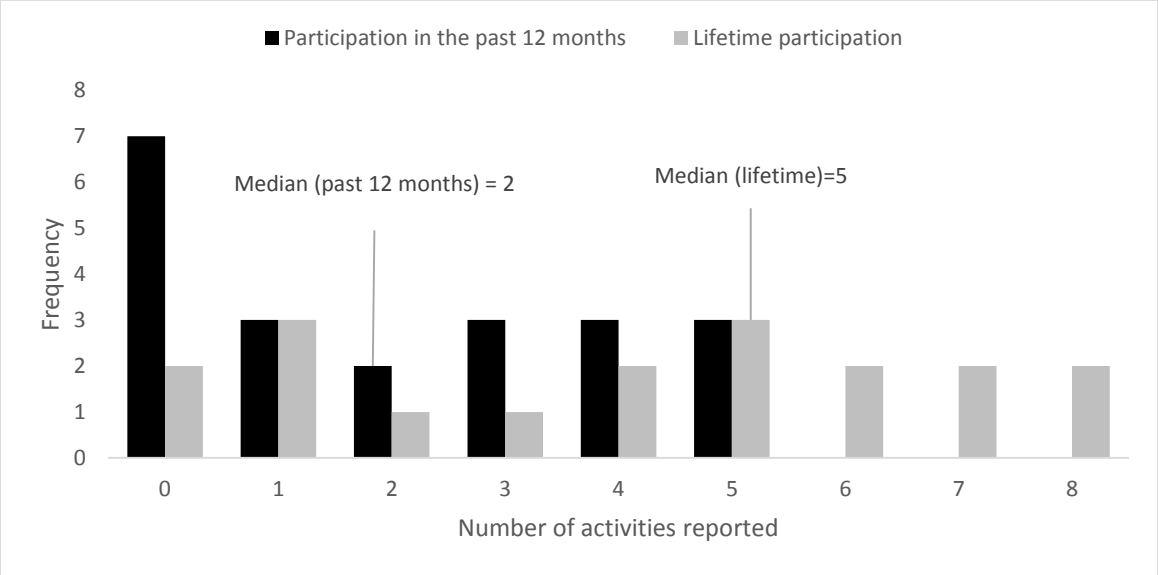
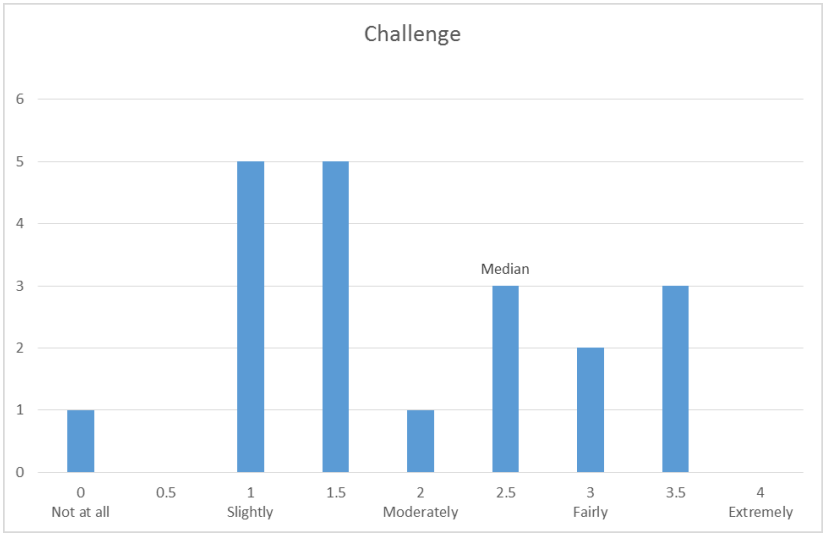
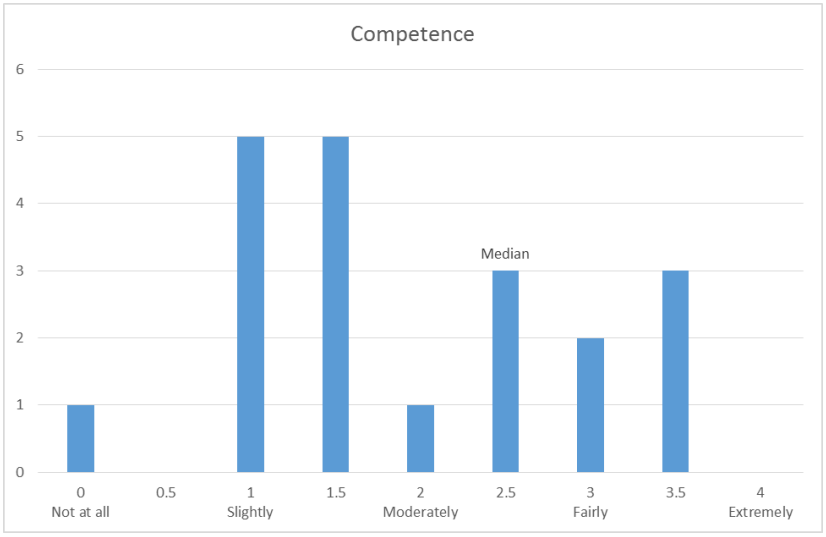
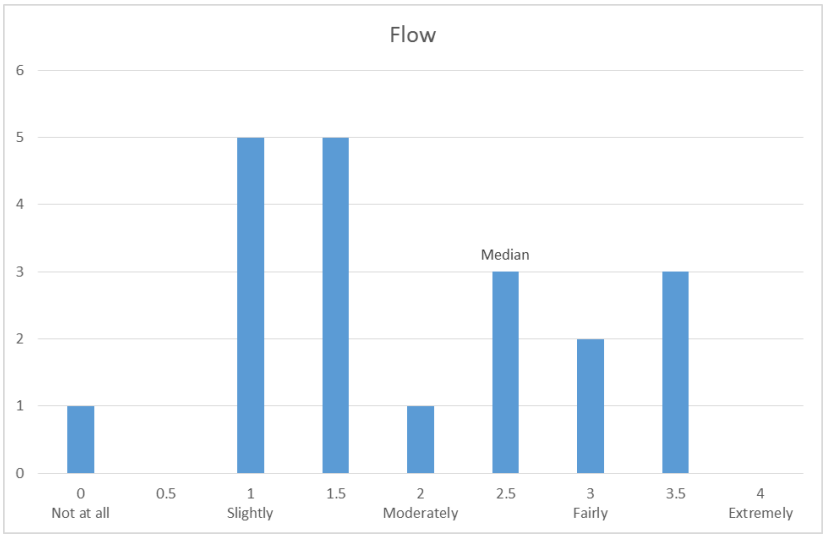


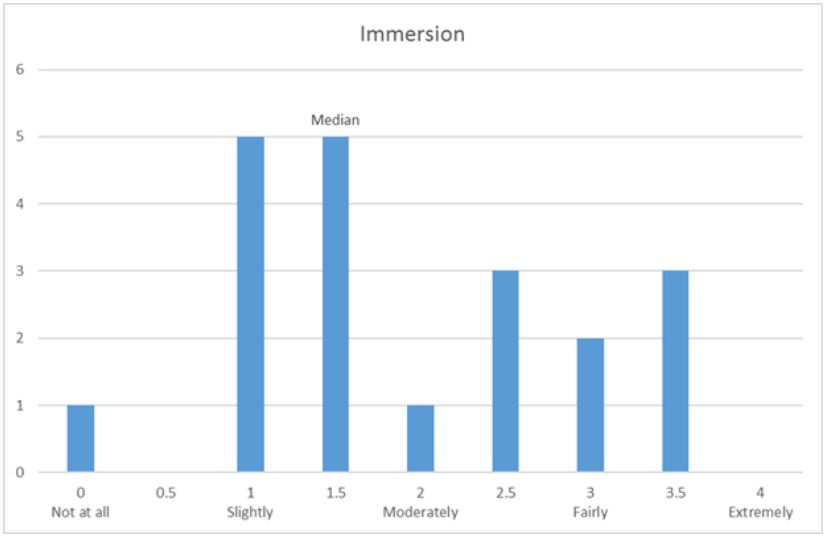

*Figure P.2. Distribution of reported participation in expression of public voice for the past 12 months, and at any time in the past.*

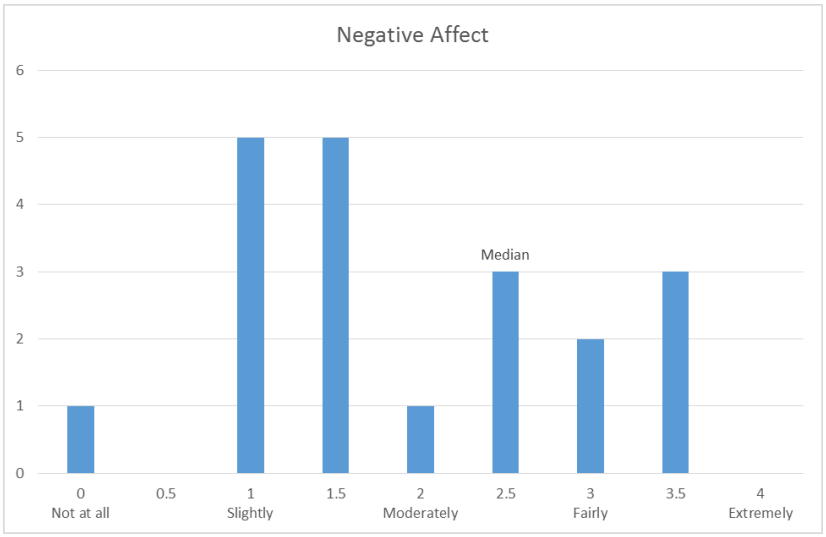
## Appendix Q—iGEQ Subscale Distributions




Flow
6
5
4
3
2
1
0
Median
0
Not at all
0.5
1
Slightly
1.5
2
Moderately
2.5
3
Fairly
3.5
4
Extremely


Immersion
6
5
4
3
2
1
0
Median
0
Not at all
0.5
1
Slightly
1.5
2
Moderately
2.5
3
Fairly
3.5
4
Extremely


Negative Affect
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5
4
3
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1
0
Median
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Not at all
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1
Slightly
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2
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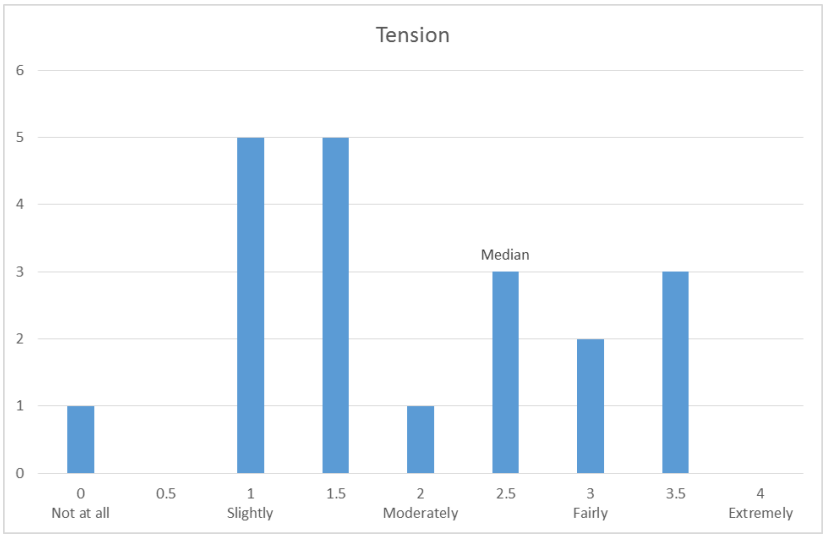
3
Fairly
3.5
4
Extremely


Tension
6
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4
3
2
1
0
Median
0
Not at all
0.5
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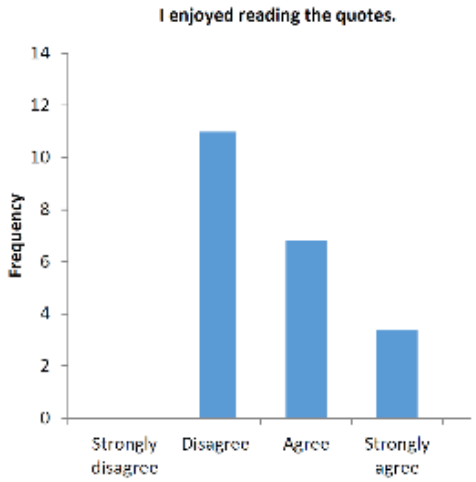
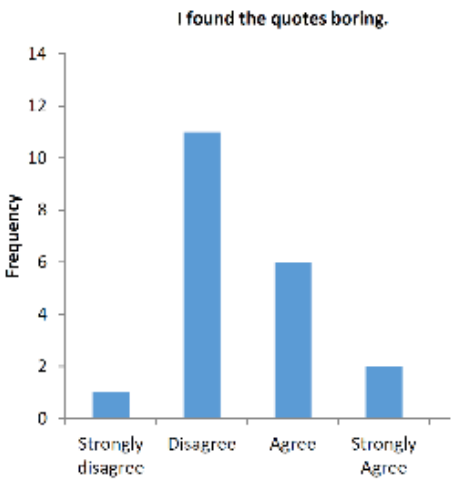
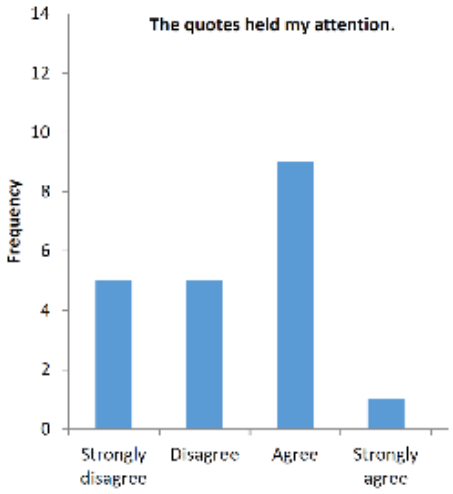
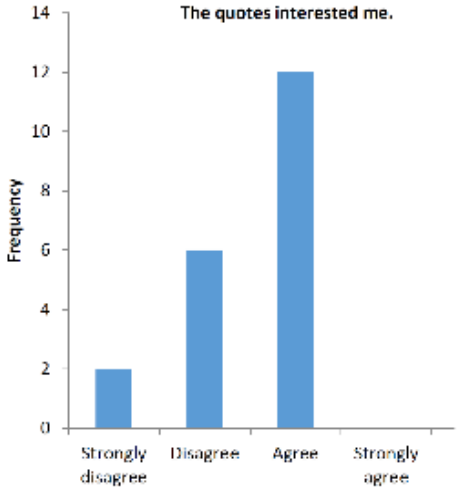
Slightly
1.5
2
Moderately
2.5
3
Fairly
3.5
4
Extremely

## Appendix R—Quote Engagement Items



**Appendix S—Discussion of the Game at Follow-up**

*Reasons for participating in discussion, grouped by post-play responses to "This game is an effective way to promote awareness of water scarcity."*

| Effectiveness rating | Follow-up questionnaire response |
|---|---|
| Strongly agree | *Reasons **for** discussing* |
| | "[I discussed it] because of message that game says. It was unique game [sic]. [We talked] about [the] problem of water and education in world." |
| | "[I] liked the game […] [I talked] about the concept [with] friends." |
| | "[I] loved the game and their intention […] [I talked about it] with my friends " |
| | "I felt like talking about the game […] I told my girlfriend and parents about the game and about the study I participated in." |
| | "It is a very innovative and excellent concept. I just loved it. […] I discuss about fun, innovation and lovely moments with friends in India." |
| | "Just to give [my friends] a view about a wonderful game based on social issue. [We talked about] what social message that the game shares." |
| Agree | *Reasons **for** discussing* |
| | "[I talked about it] with my fellow Indians. Because it tells the story of my country i.e. India. Because it tells the story about a typical Indian family." |
| | "I thought the idea had great merit. [I talked] about how great I thought it was. As well, I saw an article in the Globe and Mail about similar games (including Get Water) being developed, one of which a friend of mine […] is working on." |
| | "[I] started thinking about more games and if they too might have a message behind them […] [I talked about it with] a few friends. We talked about the game and how there was a message behind it" |
| | "I discussed Get Water! with a few people because I was interested in the idea of casual gaming and social messaging, but was unsure that some of the games features had the ability to engage its audience in thinking critically about girls' access to education, the real perils that girls face in impoverished situations (ie: how likely is it that a peacock is going to be the object that stands in your way of |

| | |
|---|---|
| Agree | attaining fresh water, and an education). […] I told my partner about my participation in the project (as a research participant). [My partner] often uses an iPhone, likes video games, and was interested in the idea of linking casual games with the possibility for social change. I also discussed my participation in the project with a few colleagues as I tried to explain some of the messaging that the game attempts to put forth to the game player."<br>“Because it was a good game […] I thought it was a great game that encouraged global knowledge. I discussed it with friends and family.”<br>*Reasons for **not** discussing*<br>“Was not a subject of interest.” |
| Disagree | *Reasons for discussing*<br>"[I talked about … the basis of the game with friends […] I thought they would like it."<br>"[I] enjoyed some aspects of the game. [I talked] with a friend who has an iPad and a young child and suggested he might want to check it out."<br>"[I discussed] the research project it was a part of […] that it was linked to the UN and my own hypotheses about the content of what is learned through gaming. [I discussed with] friends who work in the gaming industry".<br>"[My boyfriend] asked me how my day was so I told them about [the study]. I mentioned the social justice game concept and that I thought it was sort of neat but missed the mark a little bit."<br>*Reasons for **not** discussing*<br>“Didn't come up.” |
| Strongly disagree | *Reasons **for** discussing*<br>“I was surprised the game got awards even though the game itself wasn't too fun.”<br>*Reasons for **not** discussing*<br>“I did not find it very interesting.” |