

Serious Learning in Playful Roles: Socio-political games for education

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Abstract

Educational practice is closely tied to social, cultural, and political economies (Brandt, 2003; de Castell & Jenson, 2004). As videogames dominate mass entertainment revenues (ESA, 2007), the production and play of videogames also influences society (de Castell & Jenson, 2004). New media forge new relationships between learners and teachers, creating tension between student attention and the focus of teachers' limited time (McLuhan, 1959/2003; de Castell & Jenson, 2004). Today, 88% of parents with children between the ages of 6 and seventeen state that their children play videogames from once a month to every day (ESA, 2007). Of the commercial game market, "serious" games include educational games, games for military training, games for social change, and more. The serious games discussed in this paper attempt to 'persuade' the player toward a particular perspective through play. Each game addresses a social or political topic considered 'serious' by widely accepted social standards such as war, poverty, abuse, and homelessness. For the sake of brevity, I will use the term "serious games" throughout this paper to refer specifically to the kind of serious socio-political games just described, which have the intention of educating game players on a social or political topic, or that hope to influence social change.

Author Keywords

Serious games; learning through play; online videogames; autoethnography; education and technology

Introduction

Videogames are in need of critical analysis because, today, 88% of parents with children between the ages of 6 and seventeen state that their children play videogames from once a month to every day (ESA, 2007). These games are an important part of popular culture, representing and shaping the types of games most frequently played. These games then contribute to our cultural economies, as well as to social and political systems that are closely tied to education (Brandt, 2003; de Castell & Jenson, 2004). Student interests change along side changes in videogames, changes that may include technological developments or new content. Adopting videogame technology to serve the interests of teachers, parents and socially conscious community members is a natural progression for an educational system desperate to find new ways to engage students in learning. The representation of serious social issues through videogames is a relatively new phenomenon that ties videogames to education. In some cases, this tie is direct, with serious videogames being made with educational content for educational

settings. In other cases, videogames are made about a serious topic, with persuasive or ideological intentions, demonstrating an argument that can influence what students learn and how learning occurs. This paper will offer an analysis of four ‘serious games,’ based on the gameplay of the author conducted for her Master’s thesis.

Of the diverse commercial game market, ‘serious games’ include educational games, games for military training, games for social change and more. These games show promise for appropriating videogame technology to serve the social and educational needs – as well as interests – of students. In addition, these games can address important social and political topics that are of interest to parents, educators and community members. As such, learning from serious games does not need to be limited to the classroom, although the need for structure and supervision around gameplay will arise, in some cases, in this discussion. The four serious games discussed in this paper were selected for the author’s Master’s thesis because of their educational potential and social implications. These games have attempted, by design, to ‘persuade’ the player toward a particular perspective or of a specific argument through play. The relationship between this ‘persuasion’ and education will be discussed in more detail in the following section. Each game addressed a social or political topic considered ‘serious’ by widely accepted social standards, such as war, poverty, abuse and homelessness. For the sake of brevity, the term ‘serious games’ will be used throughout this paper to refer specifically to the aforementioned type of serious socio-political games. In particular, this paper will address the following questions: Which elements of serious gameplay successfully represented the socio-political content addressed in the game? How did game design help or hinder the process of learning through play? How was content built into play?

About ‘Serious Games’

Understanding the success and challenges of serious game design is a difficult task. In the case of most serious socio-political subjects, comprehensive study of historical, political and social circumstances is the only way to acquire an in-depth understanding of the topic. Various forms of media, however, offer introductions to these issues in order to give the public access to information and to increase public awareness. In some cases, rhetoric is used to persuade the public of a judgment or ideal with regard to the topic at hand. Broadly, this change in state or knowledge can in itself be considered a form of ‘education,’ where media and cultural outlets are disseminating intentional, structured information to society. ‘Learning’ in this way can lead to a shift in socio-cultural perspectives and can be the catalyst for change¹. Measuring the reach of public awareness through serious gameplay is beyond the scope of this paper. However, the author hopes to introduce the complexities of the four serious games examined for her Master’s thesis, with the intention of using these games as examples of the larger implications serious games may have for education and social change.

The Master’s research on which this paper is based examined gameplay in four serious games. The author conducted an autoethnography of her own gameplay and documented her own cognitive, physical and emotional “meaning-making” experience (Ermi & Mäyrä, 2007, p. 2). In addition, this examination occurred concomitant with a review of media, government and scholarly articles on each game’s primary topic (Dahya, 2008). The games examined introduced concepts related to the war in Darfur (*Darfur is Dying*, 2006), poverty as an obstacle to education

(*Ayiti: The Cost of Life*, 2006), teen dating abuse (*Replay: Finding Zoe*, 2007) and homelessness (*Homeless: It's No Game*, 2006). Each of these games demonstrated strengths and weakness in using serious games for education. The following section will provide an overview of existing literature in the field of serious games and games for education.

Literature Review

Persuasive Games

With regard to the use of serious videogames for education and social change, Ian Bogost (2007) supports the possibility that gameplay can be persuasive if a game's procedures are designed to express an argument or ideology². Rhetorical arguments can be carried by procedures, described as sequences of information derived from a combination of narrative, graphic design, text, sound and interactive game activities. A game's constraints, the meta-rules guiding the individual game procedures, create the framework in which the player plays. Each procedure then becomes a building block inside an already developed shell, whereby there is structure guiding the flexible and interactive experience of each player. Learning occurs as a result of the player's interaction with a series of activities or tasks, where knowledge and skill are built within the pre-designed framework that can include rules of play, narrative and the visual game space (Bogost, 2007; de Castell & Jenson, 2003; Gee, 2003). Learning occurs as a consequence of successful gameplay, supporting the hypothesis that games are inherently, if not overtly, educational.

Learning through Play

'Learning,' like 'education,' is used in this paper broadly to refer to the acquisition of knowledge, where 'knowledge' can be attained in many forms, including through cognition, emotion and physical skill. In videogame play, learning often occurs as a combination of cognitive, emotional and/or physical development due to the multidimensional design of videogames. Videogames require players to gain information about the game's topic in order to understand the virtual environment and to successfully proceed in the game; videogames can engage players in physical and mental activities that result in in-game progress; and games can envelop players in a rich setting where understanding the game world, and conquering the game's activities, can culminate in a meaningful, emotional play experience. Although extensive physical movement in gameplay is not involved in the serious games discussed in this paper, sensorimotor learning through repetitious keyboard control can occur³. Finally, learning through games can also be a meaningful experience for the player because players subjectively interpret the multimodal procedures that create a game as they relate to individual pre-existing "real-world" knowledge (Crawford, 1982; Gee, 2003).

Depending on the player's involvement, and depending on the content or storyline of the game, players can draw meaningful connections between their own lives and gameplay. Consequently, all videogames have the potential to be forums for learning and/or education, and distinguishing between learning and persuasion in serious games can be a particularly unclear line. The tactics used for persuasion are, in many cases, manifest as forms of learning for the game player.

As stated in the introductory paragraph of this paper, children and youth are spending significant amounts of time playing videogames. The nature and form of learning is changing with

prominent Western media and technology. Learning in schools, however, is often the product of the same prescriptive form of teaching that has traditionally been found in classrooms, outdating the vast improvements to communication technologies today. And, again, as students learn to engage with various forms of media, and as learning occurs through videogames outside the classroom, the way students learn changes with the new knowledge being acquired. James Paul Gee (2003) suggests that curriculum-based learning in schools de-contextualizes meaning, disassociating the learner from the experience of the subject matter being taught, because situations or experiences relevant to the material are not present in the classroom. Traditional classroom settings decontextualize learning. Videogames are a form of new media that can represent current social and political problems in innovative ways, by teaching players how to succeed in games through intrinsically rewarding forms of engagement. In videogames, learning is situated in meaningful, relevant, constructed game worlds (Gee, 2003; The New London Group, 1996). Videogames provide a virtual space where knowledge can be embedded in a relevant setting, where game players can then learn through a succession of challenging activities.

Returning to the distinction between ‘persuasion’ and ‘learning,’ game designers have the power to create game worlds and present information within whatever ideological frameworks they desire. In order to ensure that the serious games discussed for this paper offered valid and representative information, the author conducted a thorough review of media, scholarly and government documents about the socio-political topics represented in each game. The intention was to demonstrate that it is a factor of both the quality and accuracy of the content, as well as (and most importantly) the way that content is designed into the game, which will lead to successful gameplay. To review, in order to contribute to the growing body of knowledge in this field, this paper will refer to the author’s Master’s thesis to address the following questions: Which procedures and constraints successfully presented serious socio-political content through the videogame medium? How did game design help or hinder the process of learning through play? How was content built into play? The following section will briefly respond to these questions by outlining a number of challenges and successes found in this study of four serious games.

Research Findings and Discussion

Successes

Guidelines for successful development will be useful for improving the future of the serious videogame genre, in particular because the serious games discussed in this paper address complex and contentious issues. The four games under discussion are, again, *Darfur is Dying*, 2006, *Ayiti: The Cost of Life*, 2006, *Replay: Finding Zoe*, 2007 and *Homeless: It’s No Game*, 2006. From these games it was found that game design was most effective when:

- 1) game content was based on a focused concept, attitudinal change, or affective understanding of a topic or issue, rather than on a specific “real-world” situation; and
- 2) the game’s intentions were thoroughly embedded in playable, procedural elements, thoughtfully designed within the game’s larger constraints, reflecting to some degree

the complex layers of the situation(s) represented in the game

When dealing with serious socio-political content with complex historical and political contexts, focusing on an idea, concept, attitude or emotion, rather than attempting to explain a particular event or political situation in detail, provided the author with an effective form of messaging. For example, *Darfur is Dying* had two distinct parts to gameplay. The first portion of the game focused on the tyranny of the militia, represented through the act of foraging for water in the desert while armed men hunted the avatar down. The author took a third-person perspective both guiding and watching her avatar across the desert floor. This portion of the game was a strategic challenge where the avatar had to run through the desert, hiding from the militia in an attempt to fill up the water jug and return safely to the refugee camp. Ducking behind the shrubs and bushes around the desert, the author experienced fear of the approaching militia, who sought her avatar's capture. The intention of the game was to empathize with the fearful experience of being a Darfuri refugee, undergoing the frightful challenge of foraging for water in the desert. The water foraging component of *Darfur is Dying* was then successful by drawing on the visceral reaction of the player to the experience of being hunted by the militia. The challenges configured into gameplay and the virtual environment, enriched by the empty, airy sound effects broken by the faint patter of the avatar's fast moving feet, immersed the author in a setting relevant to the lesson being learned. Without offering specific information about the problem in Darfur, sympathy for the avatar – a refugee – was present, while empathy with the horror of living in fear and struggling to survive prevailed. Although these emotions were meek in comparison to the reality of these humanitarian atrocities, the game designers built a visceral argument into gameplay, in support of the experience of being a Darfuri refugee. The makers of this game did indeed base design on information shared with them by NGOs working on the ground in Darfur and Darfuri refugees themselves.

As another example, *Ayiti: The Cost of Life* took the concept of poverty as an obstacle to education and created an environment where all avenues of gameplay lead to the conceptual understanding that in some impoverished communities, it is exceedingly difficult to access education and to simultaneously meet a family's basic need for food, shelter and good health. The game is a strategy-based, two-dimensional representation of a family of five living in poverty-stricken rural Haiti. The goal is to survive for four years, divided into sixteen seasons, focusing on health, education, money, and/or happiness. At the beginning of every season the author assigned three children – two boys and one girl – and two parents to either rest at home, go to school, seek medical care or to work on the family farm, in the market or in a small selection of other jobs. Natural disasters such as hurricanes, draught and disease randomly interrupted the originally chosen plan of action; game constraints, such as work only being available for girls, demonstrated gender inequalities; and, poor quality of education and a lack of teachers contributed directly to the author's inability to educate her virtual family. During gameplay, no specific references to the current socio-political state of Haiti were made. The problem of poverty being an obstacle to education was understood through the sequence of procedures and constraints built into the game's design. Based on UN documents about poverty in Haiti, this game clearly presented information about poverty in Haiti, without attempting to unravel the origins or details around the situation.

In another example, *Homeless: It's No Game* presented an environment where the author could

relate to a homeless person, based on the inherently human feeling of self-esteem. The intention of the game was to provide a space where empathy with the difficulties faced by homeless people could be generated. This emotional understanding was established by a number of variables affecting the avatar's self-esteem, including panhandling, squeegee-ing car windows, finding a washroom, getting something to eat and being harassed by community members. The goal of the game was to survive for 24 hours while increasing the avatar's self-esteem to 25 points, through the acquisition of money, eating, finding a toilet and interacting with the community. If the avatar's self-esteem dropped to zero the game was over. The game was designed from a very basic two-dimensional top-down perspective and very little was learned about the context for the avatar's homelessness. However, this was irrelevant to learning the larger lesson that homeless people also have feelings, that they are affected by the way they are treated, and that they are aware of the circumstance in which they live. On numerous occasions, the author neared successful completion of the game only to have a random incident of crime or violence deplete her self-esteem well-below the needed 25 points. Based on information provided by homeless shelters and organizations in Vancouver, B.C., the intention of this game was specifically to make the player consider the experience of being homeless rather than considering how or why a person becomes homeless.

In the latter two games discussed, *Ayiti; The Cost of Life* and *Homeless: It's No Game*, it was not one factor or lesson that increased the author's awareness about the games' respective topics, but rather a combination of non-linear sequences of events built within a larger game context. In *Darfur is Dying*, although the water-foraging portion of the game did not reflect the political context of what was happening in any comprehensive way, its focus on the emotional experience of running for your life offered its own form of complexity. In particular, before foraging for water, the author had to choose whether to send an adult, child, male or female avatar into the desert. As gameplay continued, after one or several of the characters were captured, it became clear that each avatar had varying strengths and risk factors, making it especially difficult to decide whom to send to their possible death, rape or capture. As such, through play, these games offered a meaningful learning experience by integrating larger concepts with emotional reactions to the topics at hand. With regard to the latter example from *Darfur is Dying*, the important information that was acquired by having to select multiple avatars to forage for water contradicted the apparent point of playing the game: Successfully forage for water and maintain the refugee camp. Successful gameplay would never bring the player to a point where she or he had to decide which of the avatars to select, which, by design, overlooked a valuable learning experience about how living as a refugee varies for children, adults, boys and men or girls and women. This example leads us into the next section where the challenges to the four serious games under discussion will be presented.

Challenges

Certain elements of game design became obstacles to both successful learning and to overall gameplay. These obstacles included:

- 1) poor functionality of game mechanics;
- 2) limited playable elements; and

3) fragmented story construction not embedded in play

Poor functionality of game mechanics is one of the primary obstacles to the success of the serious games discussed in this paper. *Replay: Finding Zoe* offered valuable information regarding teen-dating abuse but, as a player, the author was unable to engage with the content material because gameplay was not functional. The focus of the game was for the avatar to find Zoe, who was suspected to be in an abusive relationship with her boyfriend, Jake. Her avatar encountered other youth who knew Zoe and Jake and she was faced with various rumours about the couple. Many negative stereotypes, assumptions, and discriminatory comments were presented in the form of dialogue between the avatar and non-player characters (NPC). When the player engaged in dialogue there was a fill-in-the-blank style activity that could result in gaining support for Zoe, if the author choose diplomatic and explanatory comments rather than defensive, hostile rebuttals. This task was ultimately boring. Because game mechanics were sticky during both the fill-in-the-blank task and while walking around the town, motivation to continue playing the game was difficult to maintain. The problem was increasingly debilitating as more people were gathered in the search. In this way, the purpose of gameplay was hindered by the game's technical inability to sustain its primary intention.

In addition, pages of Zoe's journal were scattered around the town, each offering a deeper understanding of Zoe's abusive situation. These pages offered well-written, clear insight into the experience of being a teen in an abusive relations, information that was found to be accurate when checked against the NGO documents, scholarly articles and media reports examined for content reliability. Unfortunately, the task of gathering these pages was not intertwined with the game in a meaningful way and did not contribute to finding Zoe. This was one example of how using fragmented contextual information about serious issues that are not properly embedded in the game can be a hindrance to successful play.

As in *Replay: Finding Zoe*, the second part of *Darfur is Dying* offered contextual information about the situation through fragments of information not well embedded in the game. In the second part of *Darfur is Dying*, text-blurbs available around the refugee camp offered segments of information about the civil war. Reading these blurbs, much like collecting Zoe's journal pages, may have offered more depth of understanding for the situation represented in the game, but in this case the text did not contribute to play.

In *Darfur is Dying*, textual information under question-mark icons could be read by merely scrolling over the icons. These icons provided information about the individual experiences of people facing human rights violations and offered insight into the struggles of NGOs working in the camp. Although this information appeared to be based on the actual experiences of people living in a refugee camp (as claimed by the game's developers on the game's introductory webpage), the omission of sufficient explanation for the cause of the problems obscured and oversimplified the situation. One example from the game stated that: "Maryam went with other women to collect firewood. While they were collecting wood they were surrounded by some Arabs. They all ran but two men caught her and raped her". Although a powerful insight into the horrifying experience of 'Maryam,' this statement offered no explanation for who the Arab militia were or how the dispute between this group and the Darfuris came to be so hostile. In addition, the use of the term 'Arab' to describe the militia reduced all people of Arabic descent to

one militant group. By omitting any further explanation for the ‘Arabs’, the game perpetuated the often seen Western media representation of one vilified Arab nation. Another text-blurb read: “She saw the military coming and heard some shots, then felt pain and saw her arm bleeding. ‘The world is not doing enough to protect us. We are so tired. Can someone please come help us?’” Similarly, this example perpetuated and supported media portrayals of the Western world needing to intervene and ‘protect’ war-torn Africa. Deeper analysis into the question of international intervention in Darfur showed that it is a very complex issue with strong arguments both for and against intervention – a complexity altogether omitted from the game.

Another example of a text-blurb in *Darfur is Dying* read: “Non-government organizations provide humanitarian relief, including food delivery and medical care. Aid workers work under unruly conditions and are often hindered by the government of Sudan.” This statement again failed to provide information about the context of the conflict. These examples, combined with the lack of information about the different cultural and political groups involved, portrayed one Arab nation that needed to be fought and one African nation that needed to be saved. It should be noted that content reliability for the game *Darfur is Dying* yielded varying results that did not always support intervention or present the conflict as one based simply on ethno-racial lines (Dahya, 2008).

Based on these few examples, it is clear that creating successful serious games can be a difficult task, requiring consideration for a number of factors including not only what information is presented, but how that information is built into game design. The following two sections will review in more detail the relationship between persuasion and learning and will culminate in a short conclusion.

From Persuasion to Education: Thoughts on Learning Through Gameplay

The brief literature review in this paper discussed learning through gameplay from two closely related perspectives: First, Bogost (2007) discusses the ability for games to develop an argument through procedures and constraints, leading to the persuasion of the gameplayer; Second, de Castell and Jenson (2003) and Gee (2003) are referenced as examples of how games can be successful sites for education. de Castell and Jenson discuss educational games specifically, emphasizing the need to focus on playable elements, designing “education” into what Bogost would call ‘procedures’ and ‘constraints’. Gee’s (2003) work, although focused on role-play games (RPGs), supports this theory by suggesting that students learn best in settings that are relevant to the topics being learned. The serious games addressed in this paper have each of these theories incorporated into their review because the games are both persuasive and educational in their own way. *Darfur is Dying* (2006), for example, has a clear political agenda in support of international intervention, and demonstrates to some degree an unfavorable bias against not only the *Janjaweed Militia* (who are widely accepted as being villains in Darfur) but against people of Arabic descent in general. There is a persuasive rhetoric involved in this game, subtly presenting “Arabs” as villains and “Africans” as victims. In Darfur, both people of Arabic and African descent have lived side-by-side for many years and the nature of the conflict involves issues of land and governance as much as (if not more so than) any kind of over-simplified racial divide⁴. What then are players learning in *Darfur is Dying* and whose responsibility is it to ensure that

game players are given a critical overview of all of the information introduced in the game? *Ayiti: The Cost of Life* will be used as an example of how these questions might be answered. *Ayiti: The Cost of Life* is an educational game. It has resources available online for teachers and was developed by students, for students. Although it is decidedly educational, it is interesting to see that *Ayiti: The Cost of Life* incorporates Bogost's development of argumentation throughout the games procedures and constraints.

There is an intersection of 'persuasion' and 'education' with undefined lines in each of the serious games discussed in this paper. In support of the work already done by those authors discussed in this paper (Bogost, 2007; Gee, 2003; de Castell & Jenson, 2003), the author contends that effective serious games in future will successfully incorporate a relevant setting and ingrained educational content into carefully designed procedures and constraints. Serious videogames may require a form of persuasive education in order to be effective in and outside of the classroom. For games not designed with educational resources to assist teachers, the importance of having a game design that gives a clear message is essential. Including the four examples in this paper, serious games are largely available for free online. As such, although serious games might best be suited for educational environments with some supervision, in order to critically analyze content and ensure that play results in successful learning, this cannot always be controlled. As such, the following short conclusion will project broad implications for serious games in the future.

Conclusion

Presently, game designers interested in the serious games movement have few previous examples of games with social and political content to build on or to learn from, resulting in different types of games being developed and distributed online, with few guidelines for success. Although entertainment game designers are sharing their breadth of knowledge for successful development, and although academics are beginning to devise formulas for the development of serious games (Winn, 2008), many games are limited by financial resources and production standards are far from set. In addition, games addressing social and political topics require expertise in a multitude of areas including but not limited to the game's subject matter, pedagogy in education and technology, and game design. As such, the serious games currently available range in quality and effectiveness. Nonetheless, videogames do offer great possibilities. As the videogame industry continues to grow, it makes sense to use this popular medium to the advantage of people in need of education and social change when possible. In particular, those students who enjoy playing videogames and are accustomed to the pace and design of the medium may find it appropriate to learn from the same medium with which they spend so many hours in leisure.

Based on the games discussed in this paper, however, it appears that trying to address specific details about serious social, political or historical situations may be difficult. Although the author was, at times, drawn to the subject matter in each game, based on the hands-on experience of gameplay, certain stylistic choices hindered the play and learning experience. In order to ensure that the primary intention of play – raising awareness about a serious topic – is not lost in serious game design, serious games require continuity and connectivity between each procedure and

constraint as well as throughout the totality of gameplay. It has already been acknowledged that all elements of gameplay should be relevant to the ultimate goal of the game through play (de Castell & Jenson, 2003). However, in addition, serious games need to exist with a level of complexity that mirrors to some degree the topics they are representing. Information about the situation should be embedded throughout the game in a way that does not merely provide information about one piece of the puzzle, or even several pieces in isolation from each other. Instead, serious games require a design method that will return to a core concept at each turn, while peeling off layer-by-layer the complex interactions of the social, political, cultural and economic factors involved. Of the four games discussed in this paper, *Ayiti: The Cost of Life* offers the most clear example of this comprehensive form of game design. In a simple game world constructed to represent the issue of poverty as an obstacle to education, a multitude of interactive activities lead to the player's increased awareness about the topic.

Despite notable challenges and despite being at the birth of their development, serious socio-political games for education and social change already display much success. *Darfur is Dying* has reached a millions of people (Darfur is Dying, 2006) and the water foraging portion of the game allows the player to consider, if only as a fragment of the actual experience, the fear of living in war-torn Darfur. *Ayiti: The Cost of Life* depicts the problem of poverty as an obstacle to education through a challenging and engaging form of play. *Homeless: It's No Game* offers a simple but effective way to learn how to empathize with homeless people. Finally, although *Replay: Finding Zoe* does have structural problems hindering playability, it also introduces a creative way to tackle a serious issue. These efforts should not be over-looked as valuable contributions to the future development of serious games.

These games and others like them have opened a new realm of new media use in education, social activism, and popular culture, and ongoing analysis of their challenges and success will provide a better understanding of how to use the genre to best represent socio-political content. Serious socio-political games for education and social change are in their cellular phase of development. Once they have grown and are better understood they too may be widely acknowledged as valuable forms of social representation, social construction and education.

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¹ For further reading on the topic of education for social change please see: Freire, P. (1970). *Pedagogy of the oppressed*. New York: Continuum

² The term 'ideology' is defined as a conceptual framework or body of ideas representing individual or collective beliefs. The dominant ideology of a group can help maintain existing social doctrines and practices. An ideology can accurately reflect the needs, wants and moral values of an individual, class, culture or group. Ideologies may also act as a means for dominant groups to further subjugate the oppressed, by maintaining a system which results in continually obscured social interests, supporting an existing albeit unjust way of life. In some cases, ideologies can be highly politicized when beliefs influence public policy.

³ Consoles such as the Nintendo Wii and games such as *Dance, Dance, Revolution* and *Guitar Hero* are examples of games with explicit physical components to gameplay, beyond the interactions of the gameplayer with the computer keyboard or console controller.

⁴ For a more in-depth discussion on this topic, please refer to Dahya, N. (2008). *Videogames for education and social change: Examining representation and learning in serious and persuasive digital-games*. Master's level thesis to York University.