Chapter 1
Ethical Considerations for Learning Game, Simulation, and Virtual World Design and Development

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ABSTRACT
The goal of this chapter is to identify ethical concerns that instructional designers should be aware of when designing and developing learning games, simulations, and virtual worlds. Partly taken from ethical considerations that researchers are required to follow as part of standard institutional review board processes for the protection of human subjects, we suggest specific ethical principles which designers should consider prior to and during the design of these complex learning systems as well as during the evaluation of the products. We provide examples from existing and past learning games, simulations, and multi-user virtual environments that have either followed these principles or left questions to be addressed and propose a series of ethical considerations in future designs.

INTRODUCTION
Since the early 1960s, games and simulations have received increasing attention in educational settings (Zuckerman & Horn, 1973; Stadsklev, 1974). With the rapid development of digital technologies, using simulations and games for teaching and learning is not only an alternative method, it has also been advocated as necessary for educators and researchers to motivate today’s generation of learners (Dickey, 2007; Gee, 2003; Prensky, 2001; Tuzun, 2004). The presence of rapid feedback structures, high-end dual coding of audio and visual affordances, and the very fact the kids play games at a rapidly increasing
rate in their non-school time have all prompted this imperative (Entertainment Software Association, 2007). Further, simulations and games in the classroom offer the promise of increased student interactivity, autonomy to learn at an individualized pace, and the safety to repeatedly practice skills in a digital environment without the threat of real-world consequences (Prensky, 2001; Winn, 2002).

Despite the excitement within the field of simulations and games, there are growing concerns with commercial products that do not align with the ethical responsibilities of teachers and researchers. Increasingly, news reports have shown that these technological tools, when misused, have led to child neglect (Press, 2007b) and more than one player death (Press, 2007a; Writer, 2005). Recently, the American Psychiatric Association (Press, 2007b) has even pushed to classify Internet and video game addiction as psychological disorders. Instructional designers, teachers, and researchers must be aware of these concerns as they develop or use simulations for instruction or research.

The purpose of this chapter is to examine some of the core ethical concepts that create both ethical obligations and challenges that educators, instructional designers, and researchers need to consider when designing games, simulations, and multi-user virtual environments (MUVE) for teaching and learning. To begin, we examine basic concepts of ethical obligation as have emerged from research over the past decades and then explore how games and simulations create challenges for designers.

BACKGROUND: QUESTIONS AND ISSUES

“There is no possibility of thinking anything at all in this world, or even out of it, which can be regarded as good without qualification, except a good will.” – Emmanuel Kant, *Grounding for the Metaphysics of Morals*, 1785 (Kant, 1993)

Kant’s (1993) concept of duty-based ethics places a number of questions on those who design instruction. In a field where a core assumption is that learning is good, how do we ensure that our intention to create good, innovative instruction does not have untoward consequences for learners? As our designs become ever more complex, especially in the case of recent developments focused on using games, simulations, and virtual worlds for learning, how do we think about design to maximize learning and minimize negative consequences when the numbers of variables present in the learning space are difficult to measure? If we have difficulty discriminating which variables may have influence on learning, can we make claims that our designs are good for learning?

Further, a number of questions arise that may have different answers for different designers without a common frame of reference for what the ethical responsibilities of an instructional designer are. For example, what do we owe those we design for when producing instruction in terms of guaranteeing positive outcomes? What questions should we ask and answer about the outcomes and technologies before we ever sit down to design instruction? Should we design or use the systems at all when the systems we design are so complex that we cannot discriminate variables, determine the effectiveness of the treatments, or understand the systems fully? Are we ethically bound to take special considerations with our designs for children and other protected populations in the same manner required by ethical standards established for research?

These questions are rarely addressed in the literature related to instructional design in an era when technologies and learning systems are changing at a pace faster than we can study them. Making a determination as to whether an instructional design follows a code of ethics is further complicated by a lack of detailed instructional
design reports produced by those working in the field, especially if the research findings are not overwhelmingly positive. There is a false assumption in some spheres that we can only learn from the successful designs and so those that fail, but provide important details about why they fail are rarely reported except in a few circumstances like Ted Castranova’s painful design ordeal with *Arden: The World of William Shakespeare*, which was reported in the mainstream media rather than in academic journals (Baker, 2008). Further, there are few outlets for reporting the designs of complex learning systems whether they are learning management systems such as Blackboard™ or digital games and simulations like Math Blaster™ or the Civilization series. We suggest that we can learn as much, if not more, from failed games as from successful ones.

Learning game designers, educators and researchers who are interested in using digital simulations for teaching are usually concerned with how “good” the product is, that is, how isomorphic with social reality it is, and how much students can learn from engaging with it (Aldrich, 2007). Such interests imply some ethical obligation for educators utilizing game or simulation-based methods for teaching and learning. The decision to use digital simulations or games in teaching, rather than routine classroom instruction, evidences a sense of responsibility for the teaching process. For a digital simulation to be more than just a diversion, teachers must carefully consider learning objectives and ways to integrate the simulation into other activities so that it is part of a whole learning experience. This begs the question: does this place a responsibility on the designer to ensure that there is clear explanation and presence of learning objectives with an eye towards teacher and educational responsibility?

The complexity of learning game design raises other ethical issues when we design or use digital simulations for teaching and learning because neither education nor digital simulations are value-free. One of the purposes of education is to generate or impart knowledge, skills, and attitudes, which are concerned with ethical principles of human behavior. Such principles are based on practices acceptable within specific philosophical or religious ideals, or upon practices approved by legitimate governing bodies and stem from community beliefs about moral concepts of right, wrong, and social responsibility in a society. Value assumptions are inherent in the decisions educators make in the selection of a theoretical approach, the development of a conceptual framework, and the application of information and derive from state standards, local curriculum, and community standards that emerge from school and local culture which evolves over time.

**Ethical Considerations with Games, Simulations, and Virtual Worlds for Learning**

Before we begin the process of educational game design, what questions do instructional designers need to ask and from where do these questions emerge? Rather than discussing the entire history of ethics, which other books and articles can do in far more depth, we instead define what we mean by ethics in order to provide a context for our discussion of specific ethical issues that relate to the design, use and research of learning games, simulations, and virtual worlds. Generally, discourse about ethics begins with social-normative concepts of right and wrong conduct, which we generally refer to as morals (Robinson & Garratt, 2008). These morals emerge from communicated consensus within a group of people and provide guidelines for right and wrong actions, from building individual moral propositions of right and wrong into a system of moral principles; namely, this system describes what humans ought to do in terms of rights, personal obligations, responsibilities to benefit local and global social groups, what it mean to be fair, as well as specific virtues shared by a society or bound a cultural group. Generally, ethical principles address one
major question, which is: what should we do and what should we not do?

**Situating Design Ethics in the Context of Education and Research of Games, Simulations, and Virtual Worlds**

As anyone who has conducted research involving human subjects can attest, educational researchers have a set of ethical responsibilities that are clearly defined by an institutional review board (IRB), also known as an independent ethics committee (IEC) or ethical review board (ERB). These requirements emerged out the Nazi atrocities during the Holocaust that involved abusing human subjects for research purposes. Particular requirements of research include assuring voluntary participation and informed consent; avoiding risk or harm; maintaining confidentiality and anonymity, and ensuring a right to service. While these are tied to ethical propositions, they are also tied to larger ethical concepts including honesty, objectivity, integrity, carefulness, openness, confidentiality, social responsibility, non-discrimination, competence, legality and respect for intellectual property.

Beyond these ethical concepts, there are additional requirements when working with special populations; namely, prisoners, pregnant women, and children under the age of 18, which we are bound to as researchers. These populations are viewed as vulnerable, because they are deemed either 1. unable to volunteer for research (prisoners, children) as they are either cognitively undeveloped or not considered “free” and are under the control of others or 2. vulnerable to chemical, medical and other treatments that could harm them or their unborn child. Of particular interest in educational gaming are children as a protected population as the majority of learning games developed over the last decade has focused on children (Dondlinger, 2007; Squire, 2008; Walker & Shelton, 2008).

This focus on children is troubling, especially in light of the socio-historic and financial pressures on researchers as noted in Eisen & Berry (2002), which may lead to particular problems that especially endanger this population. Several recent research depict a worrisome picture of those who grow up digitally and indicate how little we know about the effects of digital media: smart phone use is increasingly tied to chemical changes in the brain similar to those found with addictive substances (Thomas, 2009); adolescent brains are not fully mature or connected (NPR, 2010); children 8-18 year olds in the U.S. spent 7.38 hours on media daily, and that these young people packed a total of 10 hours and 45 minutes worth of content media into 7.38 hours of media use (Rideout, Foehr, & Roberts, 2010); adolescents who spend a lot of time on the computer have trouble relating to others and have poor social skills (Rideout, Foehr, & Roberts, 2010); to list a few. From an ethical standpoint, with research indicating these problems stemming from being too digital, is designing even more digital experiences for learners something we should be doing?

However, it is rare to discuss whether these protections and ethical considerations should be extended to instructional design work, especially when designs, in the case of many games and simulations, become so complex that their outcomes are difficult to control or predict. Are the questions we must ask ourselves as researchers a good guide for what we should ask before we sit to design complex instructional systems like digital learning games? Are there additional questions we should ask because of the special nature and obligations between a teacher who would use our design and those students they are sworn to protect and educate?

What makes the designs of learning games, simulations, and virtual worlds more difficult than any other types of instructional designs? There are social, psychological, and complexity factors with games, simulations, virtual worlds and even simple
Emerging Ethical Questions in the Design of Games, Simulations, and Virtual Worlds as Psychological Systems

What makes games and simulations instructional are the cognitive and behavioral psychology principles that drive learning. Concepts like attention, memory, visual, auditory, and affective stimulus and response, language and text processing, all play their part in contributing to the success or failure of any learning intervention. Many games and simulations in particular rely on particular cognitive principles, which are responsible for the high levels of engagement found in those games. Rapid feedback, intense video and audio cues, social reinforcement, identity formation and development, extrinsic motivation in the form of points and other rewards, and intermittent reinforcement have all been found to produce the high levels of attention and long hours of play that designers seeking to leverage games must use to develop engaging games.

To date, there has been little discussion on how these ethical principles apply to particular games and simulations, or on the complications that arise when we consider the complexity of game and simulation systems for learning. However, consideration of how these ethical responsibilities intertwine with the instructional design and use of games and simulations has become much more important in recent years with their rising popularity as learning tools. In the following sections, we identify a few major areas in which ethical concerns arise related to games and simulations: instructional design, research, psychological factors, and social factors.

Engagement and Motivation

Engagement among students playing games has been put forth as bearing considerable potential for education (Prensky, 2001). The primary argument for using games and simulations as cited in numerous studies has been that, “Currently, playing video games is one of the more popular activities engaging children in their free time with a reported 35% of the most frequent players being under the age of 18” (Entertainment Software Association, 2007).

Therefore, the argument continues, because kids are playing games, we should leverage the extrinsically motivating features of games and simulations to get them to engage in learning tasks they traditionally resist whether it be science, writing, math, or reading. Yet, what is unquestioned is whether it is valid from an ethical standpoint. Ethically, it is tenuous to make the claim that because kids play games, we should automatically assume that learning is there. Logically, this argument constitutes an *ad populum* fallacy in which we appeal to what is popular and therefore it must be good. By the same logic, because most 3-year olds like cookies, we should use cookies to help them learn, because, research has shown that when left to their own devices, 3-year olds eat lots of cookies. Instead, one must ask the question: do we understand how games affect players cognitively and socially? Are there negative impacts from playing games that may outweigh possible benefits? Do we understand games sufficiently to build one?

It is important to note that there are some studies linking positive motivational impacts of digital games and learning. Tuzun (2004) discovered that educational computing games could positively motivate learners. Warren et al. (2008; 2009) used the Anytown game to motivate students to practice writing skills leading to significant increases in students’ writing skills set in a 3-D environment as compared to a traditional school curriculum. Further, a series of studies conducted with the
Quest Atlantis (QA), a technology-rich game also showed increased science learning with physical models of real places (Barab, Warren, & Ingram-Goble, 2006). However, while these are interesting findings, a review of the Anytown and other QA game-related articles show numerous variables including multiple media, multiple instructional methods, classroom and teacher factors, research influences, and other confounding issues. Therefore, it is unclear which media components were really responsible for the positive impacts. Further, a lack of confirmatory studies on many games leaves one to wonder to what extent a novelty (Clark, 1983, 1994) or Hawthorne effect (Macefield, 2007) was present, especially given the sample were mainly elementary school students. Further, only one of the three QA game environments have detailed the instructional design which would allow for recreation or interrogation of underlying psychological, social, and learning principles which were present in the products (Warren, Stein, Dondlinger, & Barab, 2009).

The axiom “with great power comes great responsibility” taken from the Spider Man graphic novels and films (Lee, Kirby, & Ditko, 1962; Morris & Morris, 2005) speaks well to the use of digital simulations for teaching and learning. Fogg (1999) describes them as “persuasive technologies,” defined as “a computing system, device, or application intentionally designed to change a person’s attitudes or behavior in a predetermined way” (Fogg, 1999, p. 27). Thus, designers and users should think critically about several ethical issues when using digital products that converge technology and persuasion.

The seductive power of digital games, simulations and virtual worlds lies in their ability to forge an emotional bond with their audiences, which can become almost a need to play. Studies have found that children can develop addictive behaviors towards playing games to the detriment of their school work (MacMillan, 2006; Tanner, 2007). Such addictive behavior is often a byproduct of motivational factors designed into the game. Indeed, game developers go to great lengths to ensure that certain behaviors and power structures are encoded in the actions and interactions of the games (Salen & Zimmerman, 2004). However, educators must be mindful of the level of user engagement they seek to attain. Bangert-Drowns and Pyke (2001) formulated a 7-level taxonomy of engagement. The highest level of engagement (level 7) fosters intentional learning, involving problem-solving and self-regulatory skills. Although empowering students with more autonomy may enhance learning engagement, some studies have identified that the cognitive demands of such open learning environments may be too complex for some learners (Hedberg, Harper & Brown, 1993). Furthermore, differences in learning outcomes have been ascribed to varying learning styles. Based on his exploratory study of learner differences, DeNike (1976) points out that students with certain cognitive styles derive maximum learning from game participation while those with other styles do not.

Identity

Additionally, in an immersive game or simulation, today’s user has the capability of taking on the identity of multiple personalities at varying times. Many users often flex back and forth between multiple identities in a short period of time trying on different persona in a variety digital contexts inside of different avatars (Turkle, 1997, 2005). This can create an individual who does not develop a “changeless core” of attitudes and behaviors that will help him or her through different problems. As a result the user may not have a stable context or set of values working for them in a learning environment that requires a constructive identity (Davidson, 1996). Consequences of long-term engagement with these types of environments might be distrust, scarcity mentality, and a win/lose attitude that feed a desire for a power dynamic. Educators should also be aware that some learners are extremely social in a virtual environment, hav-
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ing little difficulty communicating and interacting with “strangers.” However, that same learner might be or become awkward in greeting real people in the physical world, withdraw from the physical world, and exhibit anti-social behaviors (Press, 2007a, 2007b; Writer, 2005).

Lastly, simulations compress time and scale, making it possible to know the outcome of decision-making and the consequences of actions within a relatively short time period. Because of this, users immersed in these environments may develop a need for instant gratification, losing the intrinsic value in the challenge of achieving things in real life: time, money, and the degree of difficulty. How long it takes to earn something, how much it costs, and how difficult it is to obtain such in real life are some examples (Kaplan, 2003).

Mental Model

The use of off-the-shelf products such as real-time simulations that have tutorial and historical content components has been one approach to using simulations to improve student learning of subject matter. One such attempt has been Squire, Giovanetto, Devane, and Durga (2005) use of the video game Civilization III, a turn-based strategy game-simulation (RTS) that allows students to take command of a civilization that existed at some time in history. Using interviews and surveys, this group found that participation in game play (a.) immerses students in historical terminology, (b.) improves student interest in the content of history, (c.) encourages understanding of the game itself as a form of historical simulation, and (d.) provides a scaffold for transfer of historical concepts and content they encountered to contexts outside of the game-simulation itself (Squire, et al., 2005).

However, the question of the accuracy of this simulation is an important one because the activities that students engage in during the RTS are not particularly similar to those that they are more likely to encounter as citizens of the United States, since few are likely to be able to control an entire nation, its economic, social, and political systems specifically. This ability to engage in play with this aspect of the simulation may be useful for allowing students to experience, but the question then is how much additional guidance must be given by the teacher or a related face-to-face curriculum along with relevant texts and non-simulation activities. Given that an off-the-shelf product may provide students with inaccurate mental models, there should be a concern that the teacher’s time will be spent not on extending learning from the game experience, but instead on correcting student misconceptions generated by it.

Distance from Reality

The free, downloadable America’s Army “first-person shooter” simulation-game has been used both to entice teenager’s into joining the army by simulating the experience of being a soldier and to train soldiers in a safe, virtual environment in which consequences of their actions do not have the severity of a real battle (Nieborg, 2005). Using regression analysis on data generated by online players and soldiers at Fort Leavenworth, this game-simulation has been shown to be effective at imparting knowledge and skills about tactics related to the practice of fighting a battle (Schneider, Carley, & Moon, 2005).

However, the users’ confidence in their actions when interacting with the simulation has a substantial impact on how well the user performs the simulated actions on the battlefield. When the feedback they received was constantly negative, it had an impact the user’s sense of self-efficacy, making them less apt to perform well in practice with the simulation (Kaplan, 2003). Moreover, soldiers fighting in the current Iraq conflict had developed specific behaviors in response to the rule-based interactions they encountered in the game which were intended to model the same rules of engagement they were expected to encounter in real combat situations (Kaplan, 2003). In the game, soldiers were able to hide behind various
objects, then jump out and kill opponents, taking them by surprise. However, when translating game experiences into real world experiences, this simulation did not prepare soldiers for the reality that bullets indeed do pass through wood crates or that opponents do not react in predictable ways each time they encounter them. The ethical question here concerns the dire consequences of using a simulation inaccurately modeled on reality to impart skills necessary for survival. Could the development of such a game result in severe, unintended harm for the learner by teaching them incorrect models of reality? While an extreme example, poorly constructed simulations may lead to lesser, but still important consequences for learners such as loss of instructional time due to needed re-teaching, which may have negative effects on their ability to learn other content.

**IMPLICATIONS: DESIGN ETHICALLY**

Assuming that we have an ethical responsibility to design games and simulations ethically, where does a design begin? Below, we propose a number of steps to engage in the mindful construction of games and simulations that result in effective, ethical designs. There are a number of questions we ask as part of any analysis component of an instructional game, simulation, or virtual world design:

- Will my intended audience benefit with minimal risks to them psychologically, socially, or educationally?
- Does my design have any inherent values that may contrast with what is best for the audience?
- Could there be unintended consequences of my design?
- Should I be using a game or simulation?

Once a designer has answered these questions, they may proceed to further analysis of the instructional problem and learning goals they seek to address with their design. Once the design starts, the following elements must be considered:

- **Begin with your purpose.** Is the purpose of your game something you can say fits within the ethical and human subjects protections? Can you say that your intended design is something you can deliver and will keep your learners from unintended harm? Are the underlying values of the game or simulation something you want to teach? For example, some games rely on improving skills such as violence or manipulation of others or non-player characters.
- **Cognitive interactions.** Once you are designing the interactions in your game, are you considering the psychological principles you are using to engage your learners? Are you leveraging principles such as neuronal structure and function, perception, attention, representation and manipulation of knowledge and identity formation in memory, reinforcement and reward in responsible ways that are unlikely to lead to complications such as addiction or identity damage, and have you included fading of extrinsic motivators leading to intrinsic motivation to learn as part of your design?
- **Audience.** Are you aware of your audience and their particular needs? Have you written text and audio cues in such a manner that you learners can adequately process and comprehend? Are you working with a vulnerable population and if so, are you taking precautions to ensure the design specifically protects these learners in areas where they are most vulnerable such as with self-control, identity formation, addiction, and other challenges?

Some of specific questions include:
1. What is my relationship to gaming, virtual world or simulations and is that influencing my recommendation that learning take place in one? Can I objectively say that I am not influenced by my own use of such products in such a way that I am not pushing for their use simply because I like them?

2. Can I say that I can adequately predict use outcomes and minimize risk of psychological, social, or educational harm to learners?

3. Can I ensure service for learners with disabilities such as visual or auditory impairment and still use games, simulations, or MUVEs?

4. Can I parse out variables in the game, simulation, or MUVE sufficiently to properly evaluate the learning outcomes and say that my product improved some aspect of learning?

5. Can I design and develop the product with the resources I have carefully and with mindfulness towards my audience, learning outcomes, and minimize untoward consequences in the time I have been given to do so?

6. Am I, or those working with me, competent to build a game, simulation, or virtual world? Do we have the design and technical skills to produce a viable product with the resources available to us?

7. At the conclusion of the design, will we be able to open it to others for evaluation, use and research or will it remain closed?

8. Can I design this game, simulation, or virtual world and respect the intellectual property of others and give proper credit for ideas contained therein?

9. Is the game, simulation, or virtual world I intend to build something I can say is socially responsible and will benefit learners within the context of established social, school, and local norms?

Below, we will use an example from our own experience to support and explain why asking these questions can lead to more ethical designs for learning games, simulations and virtual worlds.

**An Illuminative Example: From The Door and Broken Window Alternate Reality Course Games**

Over the last four years, we engaged the redesign of a university course called LTEC 1100: Introduction to Computer Applications. Based on document analysis of the course syllabus as well as through interview and survey feedback from students in the course (Robson, 2002), the design team determined that the following measures be taken to address the underlying problems:

- The number of discrete learning objectives should be revised from 750 to 150.
- Requirements of the course should be stable across sections and semesters, but revised yearly.
- The course should be centered on larger learning projects and problem solving using the software, not around disembodied learning tasks.
- Students should give instructors formative and summative feedback.

In addition, the university’s retention goals, research literature, and analysis of the existing course structure supported a redesign using problem-based learning (PBL) methods (Savery & Duffy, 1995). Furthermore, the use of story-like scenarios typical of PBL is a prominent element in digital games, media products known to engage players for hours on end. It was believed that to increase learner satisfaction and engagement the course should include game elements.

In this instance, the main instructional designer of the course had recently completed graduate work focused on using games, simulations, and multi-user virtual environments to support learn-
ing and had, at times, played massively multiplayer online games (Dickey, 2007) and other console games more than 8 hours a day. Ethically, the designer did not answer the following question prior to proceeding: What is my relationship to gaming, virtual world or simulations and is that influencing my recommendation that learning take place in one? Can I objectively say that I am not influenced by my own use of such products in such a way that I am not pushing for their use simply because I like them? Had he, it is possible that he would not have used game elements at all.

**Design of The Door Alternate Reality Game Course**

Both PBL and ARG concepts were used to redesign the computer applications course. Rather than listening to lectures, completing practice exercises, and taking frequent multiple-choice tests, students honed their technology skills by solving a series of ill-structured problems posed by fictional clients using the very tools they were expected to learn (Warren & Dondlinger, 2008). Students worked on each task or problem in small groups of two or three, using a variety of productivity and communication tools. The redesign made use of a hybrid or blended learning format. Face-to-face class time was dedicated to delivering instruction and to facilitate group problem solving. Online resources, support, and collaboration tools were also provided through the free learning management system (LMS), Moodle. However, students were encouraged to make use of whatever productivity and communication tools best fit the dynamic of their groups. Emphasis was placed on communicating with peers, in class and online, to develop viable and deliverable solutions, rather than enforcing conformity to a specific version of a designated proprietary software program. The goal of this instruction was to provide students with a general set of skills that would allow them to use any word processor, spreadsheet program, or presentation tool and adapt to new versions readily.

*The Door* ARG was designed with a two-tiered narrative structure that framed course activities and provided the context for problem solving. The first tier of this narrative engaged students with fictional clients who “hired” student teams to complete authentic tasks—a problem-based narrative approach. The second tier engaged students in game structures that included puzzles, codes, and ciphers that must be solved, retrieved or used correctly in order to gain access to materials, information, and resources that provide additional

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**Figure 1. PBL and game element relationship (from Warren & Dondlinger, 2009)**

![Diagram](image-url)
scaffolding and narrative support to the first tier learning tasks. The relationship between game and PBL task are presented in Figure 1.

In essence, each of the clients and characters in the six, PBL game-based scenarios had alternate personas, hidden beneath their client identities, and all of them were embroiled in an underlying conflict with each other as well as the unsuspecting student players. Figure 2 shows some popular alternate reality gaming sites and forums.

Within the top-level story of The Door, students were asked by “clients” to solve complex, ill-structured problems that required them to use all the major components of Microsoft Office™. The problems students faced ranged in complexity. In one instance, students had to provide directions to an inept old coach and gym teacher for how to construct a properly functioning grade book spreadsheet in order to allow him to keep his job at a middle school. In another instance, students developed an improved web site for a local night-club that included appropriate use of basic color theory and space usage. At the same time, clues appeared indicating that a software program called the Autumnal Equinox Firewall had disappeared which might have dire consequences for both the students and the world. Through these clues, the second tier of the story was revealed. The Puppet Master character of the game, Hester, offered students rewards for locating relevant game information (Warren, 2010; Warren & Dondlinger, 2008).

In this way, the Puppet Master, played by the instructor, provided soft scaffolding and additional resources for students who might be struggling either to solve the ill-structured problems or locate game resources. Game characters also acted as gatekeepers, judging the quality of student solutions and preventing them from moving to the next problem until the last was adequately addressed. As students moved through the story at both levels, clues and minor puzzles were revealed. If students were successful at piecing this information together, they might discover that the clients were intended to be the ancient Greek gods seeking to reclaim followers and power by

Figure 2. Popular ARGs (from Warren, 2009)
harnessing the power of the Internet, a power these students sought to understand.

**Findings from The Door**

Students who played *The Door* reported several benefits from playing the game:

- An appreciation for how the technology skills gained in the course applied to the world of work and would impact their future.
- An understanding of the significant role that interpersonal communications play in learning and in career success.
- A sense of empowerment fostered first by access to resources and later by development of the knowledge and skills to become resourceful.
- An increased willingness to play, explore, and experiment with tools, content, and processes that points to potential lifelong learning (Warren, Dondlinger, & Whitworth, 2008).

However, students also reported frustration with working with peers, a lack of preparedness for game and problem-based learning, and a lack of willingness to participate in the truly innovative game elements because they did not clearly see their connections to learning computer applications. After eight iterations of the course game, the designers started a new redesign of the course using the feedback received from students over a three-year period. In this instance, they began by asking themselves those questions presented above.

**Broken Window Design**

In the design of the new version of LTEC 1100, code-named *Broken Window*, the designers began with the intention to reconsider how games could or should be used to support student learning.

Based on findings from *The Door* and the Global Village Playground (GVP) capstone learning experience (Dondlinger & Warren, 2008), which had students design their own alternate reality game in order to teach humanities, speech, and other content, the designers sought to leverage an approach that differed from both approaches. In contrast, *The Door* was a game that had been designed for students by instructional designers while the GVP in which the game was designed by students. Instead, the new design leveraged a designed with approach in which students from LTEC 1100 contributed to the design of a short, five week ARG intended to show students what an ARG for learning is followed by the GVP’s designed by approach in which students would use the computer applications tools they were learning in order to solve the problem of designing their own ARG for learning by using a common, prescribed instructional design model over ten weeks.

In Broken Window design, we sought to minimize ethical challenges to the designers by taking several approaches that would maximize learning, while minimizing possible harm to learners due to unforeseen circumstance from our design.

1. What is my relationship to gaming, virtual world or simulations and is that influencing my recommendation that learning take place in one? Can I objectively say that I am not influenced by my own use of such products in such a way that I am not pushing for their use simply because I like them?

The inclusion of game components emerged from the previously conducted research on *The Door*, which supported the inclusion of game components rather than based on an individual designer’s preferences. Further, by this time, the designers were considering eliminating the components that were difficult to support.
2. Can I say that I can adequately predict use outcomes and minimize risk of psychological, social, or educational harm to learners?

By embedding more prescriptive approaches to teaching and learning as well as higher levels of scaffolds that support both online and offline learning, we sought to minimize possible harm to learners in the new version of the course. Further, we reconfigured the learning objectives in a clearer manner so that they were self-evident to learners rather than being embedded within the game narrative. In addition, we included specific roles for learners and means of coping with social challenges such as working in teams that students could appeal to in terms of rules and consequences.

3. Can I ensure service for learners with disabilities such as visual or auditory impairment and still use games, simulation, or MUVEs?

Because all of the tools we used online could be translated to audio or text, we were able to affirm that all students and our one legally blind instructor would be able to adequately navigate all game and virtual world components.

4. Can I parse out variables in the game, simulation, or MUVE sufficiently to properly evaluate the learning outcomes and say that my product improved some aspect of learning?

By reducing the number of variables present in each week, including audio, visual, psychomotor, cognitive, and other factors and tying each to specific learning outcomes, we were able to examine research questions more clearly and identify design elements that were either more successful or less.

5. Can I design and develop the product with the resources I have carefully and with mindfulness towards my audience, learning outcomes, and minimize untoward consequences in the time I have been given to do so?

This is a question we struggled with because we had not spent sufficient time analyzing our audience in the original game design. Instead, we had made assumptions that because we liked games and kids play games that all kids would want to play a learning game. This was a false assumption. In the new version of the course, we have minimized possible harm by giving students a pre-test to determine whether they have sufficient computer skills when they arrive in the course to be successful playing Broken Window. Those that are not would receive direct instruction using computer-based instruction software.

6. Am I, or those working with me, competent to build a game, simulation, or virtual world? Do we have the design and technical skills to produce a viable product with the resources available?

Given the low technological skills needed to build an alternate reality game, we felt confident that we could build Broken Window, especially given our years developing The Door.

7. At the conclusion of the design, will we be able to open it to others for evaluation, use and research or will it remain closed?

We made the design document, online resources, and job aid for both The Door and Broken Window freely available to anyone who would like to run the game or conduct research on it. Several graduate students not involved in the design have been permitted to conduct independent research on The Door.

8. Can I design this game, simulation, or virtual world and respect the intellectual property
of others and give proper credit for ideas contained therein?

As one of the goals of the course is to teach students about intellectual property, their ARG designs and our own must conform to all legal requirements of the Digital Millennium Copyright Act.

9. Is the game, simulation, or virtual world I intend to build something I can say is socially responsible and will benefit learners within the context of established social, school, and local norms?

Part of the goal of all alternate reality games in Broken Window teach students about different elements of the United Nations Millennium Goals, which are large, social challenges faced around the globe. We feel that they are important to teach and help learners become better global citizens.

CONCLUSION

“(T)he consequences of ethical failures are too visible, costly, offensive, and potentially threatening to the surrounding community to be overlooked.”
– Eisen & Berry, 2002, p. 41

There have been many arguments from post-modern theorists including Derrida (1997) and Foucault (1970, 1980) about whether ethical systems are really just word play and have no basis in a shared reality. It is important to recognize that in a field like education with its research, instructional design, teaching and learning activities that take place every day, there are clearly identifiable societal norms about the value of learning which are established by governmental organizations representing the larger social group and the majority’s values in that community. Bundled in these norms are systems of right and wrong that may be classified as ethical attitudes about how we should treat learners whether that is in research or learning settings. Just as with established rules for conducting research ethically as established after the Nuremberg Trials and updated in 2004 by the U.S. Secretary of Health and Human Service’s Advisory Committee on Human research protections, we suggest that instructional designers designing and developing games, simulations, and virtual worlds for learning must also be bound by a code of ethics and ethical thinking similar to that found in requirements for research in order to protect those human subjects participating the use of these products to minimize untoward consequences for learners.

In order to minimize risk, we recommend that designers ask themselves a series of questions tied to larger ethical concepts prior to and during the design and development phases of product creation as well as during the evaluation phases in order to determine a.) whether a game, simulation, or virtual world is appropriate to their target audience, b.) if there are sufficient means to measure whether the product actually influenced learning, and c.) whether the design’s variables can be adequately controlled in order to minimize social, psychological, and learning risks to users. As noted earlier, these questions tie to important ethical constructs that have already been established for research and hold similar importance for the design of games, simulations, and virtual worlds in order to protect users from possible harm from our designs.

We contend that by considering these questions, an instructional designer can maximize educational benefits and minimize risks for learners. Further, they encourage designers to determine whether embedding instruction in a game, simulation, or virtual world will actually improve learning in a meaningful way rather than being a novel, temporary extrinsic motivator that loses its effectiveness after a few, short uses. Moreover, these considerations challenge the designer to ask the fundamental question that
is not always foremost on our minds as we seek to excite learners which is: should I?

REFERENCES


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KEY TERMS AND DEFINITIONS

Ethics: A system of moral principles; namely, what people ought to do; this specifically focuses on rights, obligations, benefits to society, fairness, or specific virtues. Also known as: Ethical principles, ethical systems; similar to: moral principles; associated in the manuscript with: morals, design decisions. Notable appearances of this term can be found on: 1, 2, 3, 4, 7.

Game: Games are systems that include 1.) artificial conflict spurring play, 2.) win scenarios concluding play, and 3.) a rule-based system governing play and providing interaction for players. Also known as: digital games, electronic games; similar to: analog games; associated in the manuscript with: learning games, educational games. Notable appearances of this term can be found on: 1, 3.

Alternate Reality Game: Alternate reality games are online games blending real world treasure hunting, interactive storytelling, audio, video, video games and online community. Also known as: ARG; similar to: augmented reality games; associated in the manuscript with: video game, ARG, The Door, Broken Window. Notable appearances of this term can be found on: pgs. 8, 9, 10.

Simulation: A simulation is a model of a system. Also known as: reality model, similar to: virtual model; associated in the manuscript with: simulation games, learning simulations. Notable appearances of this term can be found on: 1, 6.

Human Research Protections: Principles, regulations, and policies affecting research that include human participants in research activities. Also known as: Institutional Review Board Protections, similar to: IRB, HRP; associated in the manuscript with: Protecting human subjects. Notable appearances of this term can be found on: 3, 13.

Instructional Design: Using theories and models of learning and instruction, instructional design is the systematic development of learning specifications to be used by teachers and learners or as part of a technological development to support learning activities. Also known as: learning design; similar to: curricular design; associated in the manuscript with: learning environment design process and research. Notable appearances of this term can be found on: 7, 8, 9.