Chapter 14
The Mechanic is the Message:
How to Communicate Values in Games through the Mechanics of User Action and System Response

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ABSTRACT

Humans learn through play. All games are learning devices—though most teach the player how to play the game itself and do not strive to communicate information with utility in the real world. This chapter is for designers seeking to design game mechanics to communicate learning objectives, values, and ethical messages. The term "mechanic" describes both a) the actions a player takes as she interacts in the context of a game (e.g., run, jump, shoot, negotiate) and b) the response of the system to player actions. In other words, the mechanics are the essence of the player interacting with the game. When the mechanics of a game align with the values the game's designer strives to communicate, then the player is learning those values experientially. Learning science shows us that this type of experiential learning is a powerful and natural type of learning for humans. Designing game mechanics as described above is easier said than done. This chapter includes six best practices for achieving success, which are supported by case study examples from leading designers in the field.

INTRODUCTION

"For the things we have to learn before we can do them, we learn by doing them" - Aristotle (2002)

When Marshall McLuhan coined the phrase "the medium is the message" in his book *Understanding Media* (1964), he meant that the form of a medium is integrated with the message it communicates. Any given medium, by its structural particulars, has a large effect on how the messages conveyed through it are understood. For example, print media is good at communicating complex, nuanced messages that may take many hours to consume. This is because the user can carry print media around, start and stop reading at her leisure, and so forth. In contrast, broadcast television is not as good at com-

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municating complex, nuanced messages because its structure is different, for example, the user is more likely to consume it in short snippets, or consume it when not applying her full attention. Print is different from television, which is different from film, which is different from hypertext, which is different from games. The structural differences in each medium beget presentation styles that are attuned to their strengths. The types of messages that the mediums can convey is also affected. The title of this chapter is a play on McLuhan's phrase in specific context to games as a medium, but the big-picture meaning is the same. That is, the interactive, goals-based structure of games greatly affects how messages that are embedded in games are understood by users. The title emphasizes "mechanics" because what the user does when interacting with a game is at the heart of how messages are understood, learned, and internalized. And they are at the heart of what makes games unique from other media.

Good games have the power to communicate nuanced messages in ways that linear media simply are not capable of conveying. Take the example of the driving simulation game *Gran Turismo 4*. Users are able to learn and practice fine points of race car driving including the advanced physics of racing—such as drift, weight transfer, grip angle, and many others—by actually doing those things performatively.

The stated objective of *Gran Turismo 4* is to be "the real driving simulator" (Sony Computer Entertainment, 2005). The developer, Polyphony Digital uses game mechanics—in this case steer, brake, and accelerate—to communicate that objective to the player. The point of this chapter is to show how game developers can custom design mechanics to best communicate analogously rich and subtle messages from other fields to players.

Ethics are the moral standards by which people judge behavior (Agnes, 2001). Linear media are very restricted in how they can communicate ethical messages in contrast to games. Games, because of their interactive nature, have the potential to allow users to receive ethical messages experientially. The best practices listed herein are intended to enable designers to create interactive systems that communicate sophisticated messages, particularly in the area of values and ethics.

Understanding Mechanics

"Games are a series of interesting choices" Sid Meier, (Diamante, 2008)

There is a generic core mechanic in all games that can be described as (a) player makes a choice, (b) system responds to that choice, (c) repeat. This genericized description is true for all types of games including single player games, multiplayer games, turn-based games, and real-time games (Fullerton, Hoffman, Swain, 2004). When people utilize the mechanics of the game, they are inherently learning how the system of the game works. When building a game for purposes beyond entertainment designers often create mechanics that communicate concepts, values, and ethics from the real world to our players.

As an example, consider *Gran Turismo 4* again. It's a driving simulation game: to play this game a race session starts and players make choices that affect their on-screen racecars. Typically, at the start of a racing game the player chooses to "press accelerate button." The game system responds to this choice with fluid visual and aural feedback to each player. The cars move forward, engines roar, and tires squeal. Each minute choice about steering, accelerating, and braking the on-screen racecars is communicated back to the players and is part of the game state held in the software. As the players practice these simple mechanics in fluid response cycles with the game system, they are able to experience and learn aspects of auto racing that range from basic to advanced.

These lessons about automobile racing are afforded by the mechanics in *Gran Turismo 4*.

Table 1. Survey of core mechanics

Game Title	Core Mechanics	Core Messaging
Full Spectrum Warrior (Pandemic Studios, 2004)	Move, Fire	Tactics for squad-based combat
Peacemaker(ImpactGames, 2007)	Choose from list of Leadership Options—Military, Diplomacy, and Construction	Dynamics of the Israeli-Palestinian conflict
The Redistricting Game(USCGame Innovation Lab, 2007)	Adjust Map	How U.S. congressional redistricting works
Civilization IV (Firaxis Games, 2005)	Move, Build, Attack, Negotiate	How civilization evolves

The player uses the same actions in the game that drivers use in real racecars—e.g., "steer," "accelerate," and "brake"—and the system responds in a way that simulates reality. The player can practice using the standard Playstation controller. For example, she can steer with the Left Analog stick, accelerate with the X button, and brake with the Circle button. Or, she can use a Playstation driving peripheral and practice the same hand, eye, foot coordination used by real drivers (e.g., she can steer with her hands using the Steering Wheel controller, accelerate with her right foot with the Gas Pedal, and brake with her left foot with the Brake Pedal).

This short deconstruction of *Gran Turismo 4* is included to illuminate the mechanics of the game and show how they communicate messages about automobile racing in extreme detail. These mechanics in context to the level design in *Gran Turismo 4* provide a rich learning environment. Players are free to play and experiment with a variety of choices—such as drive into a wall—to gain understanding of the content. They do so in a safe environment – i.e. one that is free of consequences in the real world. This enables the player to experiment without fear for physical safety or being financially liable for the cars they damage. The mechanics allow players to practice the craft of auto racing until they have attained true expert knowledge about the topic. After sufficient practice, players can not only speak intelligently about how to drive a racecar, but have also absorbed the concepts that would help them learn how to race a real car efficiently.

As a counter example, take the game *Grand Theft Auto IV*. This game has mechanics that do not punish users for behaviors that are regarded as unethical, immoral, or illegal in real society, such as running over pedestrians, or wanton destruction. By doing so, the creators of the game are accused of communicating the ethical message that these behaviors are legitimate in the real world.

Deconstructions of mechanics can be done for any well-designed game. In Table 1, please see a chart that includes some game titles, along with their mechanics and basic learning objectives.

In each of the examples in the chart, the mechanics of player action plus system response create a rich and dynamic learning experience for the player.

In the next section I provide background and research influences for the arguments in this chapter. The background sets the stage for the core of the chapter – "Best Practices for Designing Mechanics that Communicate Learning Objectives."

BACKGROUND

"Tell me and I forget. Show me and I remember. Involve me and I understand" Chinese proverb (Rohsenow, 2003)

The best practices for designing mechanics that communication values, ethics, and learning objectives cited in this chapter draw from a) interviews with leading serious game designers and

b) literature from multiple fields including game design and learning science. This section provides background on the most influential designers and their games, and games literature.

Research Influences from Literature

Henry Jenkins III and Randy Hinrichs cited the following key finding in their *Games to Teach* research, which was conducted from 2001-2003: "most educational games have failed because they use generic game templates (e.g., *Pac Man*) rather than original game rules designed to illustrate the rules of a system" (Jenkins & Hinrichs, 2004). This finding illuminates the fact that most serious game developers utilize existing game mechanics (such as trivia questions or shooting) when developing their work. This is not to say that using these mechanics is wrong, but it is just to say that they typically do not communicate learning objectives as articulately as developers might like. This makes sense considering that the designers of games such as *Pac Man* were trying to achieve stickiness and arcade fun and were not striving to communicate values and ethics.

Ian Bogost, in his book *Persuasive Games,* describes the expressive potential of videogames using the term "procedural rhetoric" (2007). Bogost argues that, "Procedural rhetoric is the practice of using processes persuasively, just as verbal rhetoric is the practice of using oratory persuasively and visual rhetoric is the practice of using images persuasively" (2007). Procedural rhetorics are interesting because they afford a powerful, experiential way to communicate how things work. Games are a form of expression uniquely suited for achieving true procedural rhetoric. This is because no other form allows a user to receive messages experientially through the loop of user action and system response.

In our book *Game Design Workshop,* Tracy Fullerton and I describe a methodology called "playcentric design." It is a methodology that stresses (a) rapid early prototyping of interactive systems, (b) playtesting these prototypes with real users early in the process, and (c) iteration throughout the production (Fullerton, Swain, & Hoffman, 2004). The methodology has been proven effective for creating original play mechanics for both entertainment games and serious games. Playcentric design methodology is directly applicable to the process of creating mechanics that communicate values, ethics, and learning objectives.

Dozens of frameworks have been published for understanding human learning and the fundamentals of effective instructional systems. The book *Instructional Design Theories and Models* by Charles Reigeluth alone includes twenty such models (1999). Prominent works in the field include Robert Gagne's book *The Conditions of Learning and Theory of Instruction* (1985) and Jeroen van Merrienboer's book *Training Complex Cognitive Skills* (1999). Close examination of all the frameworks published to date allows one to distill some underlying principles that are shared across the field. First, the frameworks collectively suggest that the most effective learning environments are problem-based. Second, they suggest engaging users in the following phases: (1) activation of prior experience, (2) demonstration of skills, (3) application of skills, (4) integration of these skills into real-world activities (Hmelo-Silver, 2002). This meta-framework can be applied directly to the design of serious games.

Influential Games and Their Designers

The following are four engaging, well-designed games wherein the mechanics have been designed to (a) achieve a desired procedural rhetoric and (b) communicate rich ethical messages. They are included here to provide tangible, case study examples that illustrate the best practices in action. The learning objectives in each game are communicated to the player as she interacts, experiments, and plays with the game. A lead designer from each of the games graciously provided

insights for this chapter via personal interviews with the author.

- *Peacemaker* (ImpactGames, 2007)—This is a turn-based strategy game that simulates the Israeli-Palestinian conflict. The player may play as the leader of Israel or the Palestinian Authority. The actions available to the user closely match those available to the real leaders. The core mechanic in the game is easy to understand: each turn the player gets to choose one leadership action from a set of choices. For instance, when playing as the Israeli leader you may choose the action "Give a Speech to the Palestinian People" and then the qualifier "About Anti-Violent Resistance." The choices available to each leader are quite different, and match those of the real Israeli and Palestinian leaders. The object of the game is to establish a successful two-state solution to the conflict, and doing so earns you the Nobel Peace Prize. The design team for this game included both Israelis and Palestinians. The interface in the game includes feedback thermometers and a score that change frequently according to the player's actions. The high sensitivity of these metrics communicates a message of "this is a very delicate balance" or "you are walking a tightrope with ethical and societal consequences here". The beginning of the game is particularly challenging and the situation only gets better as the player makes progress. This positive feedback mechanic communicates the values of tolerance and compromise intended by the designers. These mechanics show how the conflict and its violence could be diffused. A lead designer on Peacemaker and Executive Producer, Asi Burak, offered insights about his process in creating the game for this chapter.
- *Tactical Language & Culture Training System* (Alelo, 2006)—This is a simulation game system that allows the player to learn foreign languages—including Arabic, Pashto, and French—in an immersive 3D environment. Player actions are spoken commands given in context to the culture being studied. For instance, in the Tactical Iraqi version, the player moves through 3-D Iraqi markets and other spaces and speaks to virtual Iraqi citizens by literally speaking into a headset microphone. The game allows the player to both practice Arabic and practice interacting successfully in Iraqi culture. The game has been used to train thousands of members of the U.S. and Australian military. A lead designer, Dr. Lewis Johnson, provided insights for this chapter.
- *The Redistricting Game* (USC Game Innovation Lab, 2007)—This game teaches the fine points of congressional redistricting including how it works, how it is abused, how it affects America's representative democracy, and how it could be reformed. The rules of the game are translated directly from the laws for redistricting in U.S. states. The core mechanic—moving district lines on a map—matches directly to what redistricters do in real states. After the player completes each mission a newspaper is displayed that includes a victory headline that tells the her she successfully achieved the objective that was given to her by her party and it also includes an Op Ed article that explains the ethical ramifications of her actions. For example, if a player successfully completes a bi-partisan gerrymander, as per her party head's instructions, she wins the mission but learns the effect that such techniques have on a representative democracy in the real world. As lead designer, I will offer examples

from trials of the game in the best practices sections below.

- *SurgeWorld* (Red Hot Learning, 2009)—This game is designed to teach disaster preparedness—particularly how to manage crises during surges of patients—to hospital personnel. The rules of the game are taken from California hospital operations doctrine. The mechanics involve rapidly clicking hospital personnel and other resources and choosing how to allocate them. The player is barraged with medical triage decisions – e.g. choosing which patients receive treatment based on the severity of their wounds and the hospital resources available. In many situations the player must learn to make the hard ethical choice of categorizing a severely wounded patient as "unsalvageable" in order to save more patients overall. A lead designer, Duane Dunfield, provided insights for this chapter.

All of the games mentioned deal with value judgments and ethics overtly and in ways not traditionally explored in games. In addition, each is designed to be accessible and fun while still providing a rich learning experience that will translate to knowledge in the real world. And they each include clear objectives for the players and tangible scores at the end. Case study examples from these four games appear throughout the best practices.

Best Practices for Designing Mechanics that Communicate Values and Ethics

One of the most difficult tasks people can perform, however much others may despise it, is the invention of good games. C.G. Jung (Zagal, Nussbaum, & Rosas, 2000)

The following best practices are taken from the author's experience designing original play mechanics for dozens of games including entertainment games and serious games and from interviews with leading serious game designers. An emphasis is made here on designing mechanics that communicate values and ethics.

The best practices are:

1. Integrate Subject Matter Experts Throughout
2. Identify and Prioritize Learning Objectives
3. Embrace Playcentric Design
4. Learn from Learning Science
5. Maximize Credibility through use of Objective Information
6. Formally Assess Learning

1. INTEGRATE SUBJECT MATTER EXPERTS THROUGHOUT

All of the interviewees for this chapter stressed the necessity of working with good Subject Matter Experts (SMEs) during the game production process to ensure that the game communicates real world messages and values. SMEs consult to the design team to interactively help them learn the fine points of the topic that will be simulated via the game. They typically work part-time providing insights and feedback on the work of the full-time team. Productions that utilize multiple SMEs can get a more diverse set of perspectives on the topic. It is recommended that at least one SME not only have knowledge about the topic being simulated, but also deep experience interacting with it and/or immersed in it.

SMEs should not be expected to design the game but rather provide information about how the topic functions so the designers can translate that knowledge into a closed system of objectives, rules, procedures, and resources. Teams should, of course, also consult books, articles, movies and

other media that feature the topic. Linear media, however, cannot communicate functional nuances and the full possibility space of a topic in the same way that a set of engaged SMEs can.

At the start of a production SMEs should assist in the development of the learning objectives for the application (see more about this under #2 "Identify and Prioritize Learning Objectives" below). SMEs can do this by translating their expertise with the topic into a set of tasks that a user should be able to complete and concepts that she should understand in order to demonstrate competence. During the production, a set of SMEs can test the game and comment on whether it simulates the topic appropriately and whether it enables users to reach an appropriate level of mastery. In this way, SMEs are integral to the iterative design process (see more about this under #3 "Embrace Playcentric Design" below).

Mechanic Design Case Studies

It is difficult to make useful statements about how to design play mechanics that apply to all types of games. This is because comparing one game to another is rarely an apples to apples comparison. For example, consider the lack of commonalities between *Solitaire* and *World of Warcraft*. Instead, this chapter provides mechanic design case studies from the four games listed in the Background section. The intent is for these case studies to provide actionable concepts that readers can apply to their own game productions.

Peacemaker

From the first day of the development process for *Peacemaker*, developer Asi Burak intended for the actions in the game to simulate the actions available to Israeli and Palestinian leaders authentically. The team of developers included Israelis, Palestinians, and Americans and relied on SMEs from all perspectives. Burak, an Israeli, says "Even I learned things that I didn't know about the process [of diplomacy] as a result of having [Palestinians] integrated into the process" (personal communication, November 10, 2008). The actions available in the game are finite and were crafted by studying actions taken by the real leaders over the years. The team used creative judgment to distill the finite list into a system of about 40 specific actions per side. The actions are organized into the categories of Policing Actions, Diplomatic Actions and Infrastructure Actions. For example when playing as the Israeli leader the player can choose a Diplomatic Action to give a speech that is Pro Law and Order, Pro Reconstruction, Anti-Violent Resistance, or Pro Violent Resistance. Each action affects game variables in opposing ways. For instance, if the Israeli leader chooses an action that gives concessions to the Palestinians it will (a) increase trust with them and (b) decrease the security of the Israeli people. SMEs helped craft the actions and ensure the realism of the system response to those actions.

Tactical Language & Culture Training System

Lewis Johnson integrated three types of SMEs into the production for *Tactical Iraqi* (personal communication, November 17, 2008). First, they used native Arabic speakers as language experts who helped ensure that Arabic was being accurately translated both in terms of words and grammar. Second, they utilized task experts from the U.S. military who helped craft the tasks in which the players would engage in the game. For instance, in the game, the player acts as a Navy officer tasked with going ashore and setting up a disaster relief site. In addition to Navy SMEs, they use SMEs from the Marines for Marine Corps scenarios and Special Forces for Special Forces scenarios. Tasks like this in the game are important because they allow the player to practice language in context to situations in which the player may actually find himself after completing the training. Third, the game utilized Iraqi culture experts to craft

cultural lessons that can be communicated to the player through play. For example, the player learns through playing in the world that in Iraqi culture, one should let a sheikh enter a room first. Actions are taken primarily via speaking directly to the game via a microphone. The game responds to words from the player in context to the language, task, and culture integrated into the system.

The Redistricting Game

The Redistricting Game utilized multiple SMEs including a professor who studies redistricting reform as well as several people who have redistricted real U.S. states. The core mechanic of the game is a feedback loop of the player adjusting the district lines on a map and the system responding to that action. For instance, when the player moves a line on the map, the virtual congresspeople on the map will squawk with disapproval if that move reduces their chances of being re-elected. During playtesting for the game, the SMEs commented that the actions and strategies that testers were using were identical to those used by real redistricters. The testers, in fact, were employing very sophisticated strategies that one would find described in political science textbooks, even though they had no exposure to those books or even any training in how to redistrict. Thus, the mechanics of the game were communicating sophisticated messages about redistricting in a similar way to how the mechanics of *Gran Turismo 4* were communicating sophisticated messages about auto racing. As an example: when first exposed to the game players naturally adopt the common redistricting techniques "packing" and "cracking". "Packing" means concentrating like-minded voters in one district to reduce their voting power in other districts (USC Game Innovation Lab, 2007). "Cracking" means spreading like-minded voters apart across multiple districts to dilute their voting powers in each (USC Game Innovation Lab, 2007) Players seize upon these ideas on their own as they play the game because they are logical strategies for winning – not because they have learned about the technique elsewhere.

The SMEs vouched that the game was indeed delivering the messages accurately and they made suggestions about potential tweaks to the level designs in cases where they were not.

SurgeWorld

SurgeWorld was created in conjunction with the staff responsible for disaster preparation at Children's Hospital Los Angeles. These SMEs included nurses, doctors, administrators. In addition, university researchers who craft emergency procedure policy for the state of California were also involved. The design team talked to SMEs on all levels and read all available documentation about hospital procedures and operations. The team was allowed to participate in disaster drills at the hospital in order to observe how the staff actually operates in these situations. Prototypes of the game were tested by the staff and feedback was iteratively incorporated into each new version of the game. In the end the collaboration between game designers and SMEs resulted in a playable system wherein the core messages of California emergency procedure doctrine are communicated experientially when a player plays the game. Players gain hard knowledge that will help them react appropriately in the event of a real crisis.

In conclusion, for each of the four games listed above close collaboration with SMEs was integral for designing the mechanics and messaging. Since each of the four example games also deals with ethically charged issues it was imperative that the creative judgments of talented SMEs be expressed in the playable systems. Without these qualified judgments from SMEs each design team would have to learn the topic from written sources, such as books and the Internet, and would be hampered in their ability to accurately convey nuanced messages.

2. IDENTIFY AND PRIORITIZE LEARNING OBJECTIVES

In nearly all commercial games, developers make design choices based on maximizing player fun. This is because commercial games are created for entertainment. In serious games, developers want the game to be fun but also need to prioritize the communication of learning objectives when crafting their game environments. Since the vast majority of games created have been entertainment games, the development community is not oriented toward defining learning objectives at the beginning of a production. Adopting this learning objective-oriented mindset is a necessary first step toward creating mechanics that can communicate the appropriate real world messages effectively.

One compelling way to identify the learning objectives for a serious game is to conduct a needs analysis with the SMEs. This process will identify the skills that players need to develop proficiency in and the concepts they need to understand to excel in a given subject. A needs analysis will yield a list of pertinent concepts. Once a needs analysis has been conducted in collaboration with SMEs, the team can go about translating them into formal learning objectives or statements that describe what users should be able to do after completing the game. For example, during a needs analysis for *Peacemaker*, the learning objective "participants need to understand the dilemmas facing the leaders in the Israeli-Palestinian conflict" may have emerged. In *The Redistricting Game* the learning objective "participants need to understand how redistricting is used and abused in America" emerged.

It is useful to write out these learning objectives in sentence form and rank them in order of importance. When the objectives are clearly defined and prioritized, the team can use the list directly when making design decisions. This means the team will tweak the rules, procedures, resources, and other formal elements in context to the prioritized objective list to ensure that players receive the desired messages. Let's unpack this by using *Gran Turismo 4* as an example. The objective is to provide a realistic simulation of auto racing, and the enable users to experiment with acceleration speed, braking distance and traction. The game used data from real cars, enabling users to experience authentic auto racing. In contrast, the game *Burnout Paradise* uses fictitious cars and the game variables, which are tuned for maximum entertainment value. The objective of *Burnout Paradise* is to deliver an arcade driving experience with outrageous explosions and car pile-ups, not to simulate real race car driving.

Mechanic Design Case Studies

Peacemaker

Asi Burak states that a main objective of *Peacemaker* is to communicate what real Israeli and Palestinian leaders do—the dilemmas they face, the constituents they serve, consequences of their actions not only in the Middle East but around the world (personal communication, November 10, 2008). By starting with this objective and building mechanics accordingly, the game is able to provide the player with a learning experience that allows a user to understand how the conflict works. The game provides clear context for many of the places and events that a user hears about in the real news about the Israeli-Palestinian conflict but does not necessarily understand.

Tactical Language & Culture Training System

The *Tactical Language & Culture Training System* has the objective to teach languages naturally via spoken word in the context of the culture where the language is spoken. This structure allows the player to not only learn the standard language components—vocabulary, syntax, and grammar—but also a way for them to practice it in true-to-life situations. The core mechanic of

the game is designed to simulate real life situation in a literal, experiential sense; for example, via speaking out loud in the native language. This mechanic provides a safe environment for the player to practice and make mistakes until she can competently take the skills developed to the real world. Johnson points out that "literal", in this case, still takes a back seat to the game's learning objectives. For instance, in *Tactical Iraqi*, none of the NPCs (non-player characters) speak English and no translator is available to help. While this is atypical for real world situations in Iraq because many people speak English and there are often translators available, it helps deliver the game's learning objectives (to teach the player to speak Arabic) more effectively.

The Redistricting Game

This project has the formal learning objective to teach players the details of congressional redistricting through play. These fine points include showing the player how redistricting works, how it is abused, options for reform, and how partisan and non-partisan redistricting affects America over time. These points are communicated through the simulation via the core mechanic of changing boundaries on fictitious but archetypal state maps. Each time the player changes a boundary the variables in game are updated and the game responds to this new state. In other words as the player moves a line on the map the population data in the districts updates and the cartoon congressperson speaks his or her mind about the change the player has made. For instance, in Mission 3 if the player moves a line adds lots of Democratic voters to the district of Republican congressman Arnie Surplus the system responds as follows (a) steam comes out of Arnie Surplus's ears, and (b) he stands up angrily and says "You've overrun my district with Democrats! It's an act of war!" (See Figure 1).

SurgeWorld

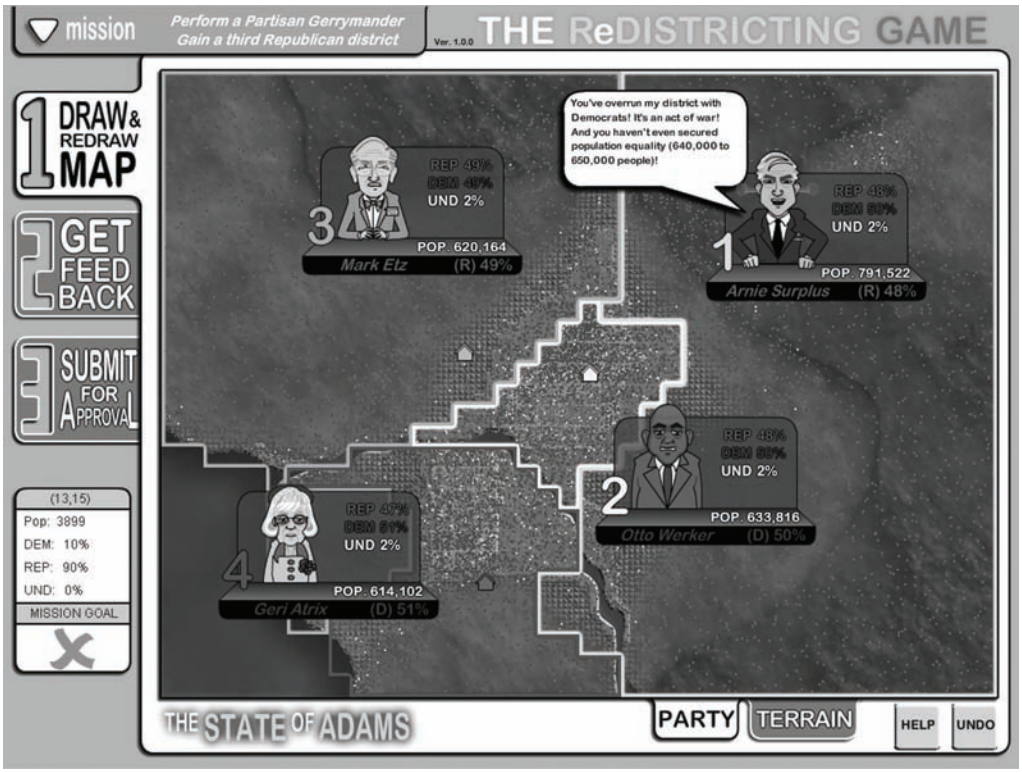
Duane Dunfield says that the learning objective in *SurgeWorld* is for real hospital staffers—doctors, nurses, administrators, and other personnel—to be able to practice acting effectively in a variety of disaster situations (personal communication, November 25, 2008). The game allows the staffers to see the big picture of how such situations work and experience the roles of each of the participants. Staffers can practice overcoming the situations repeatedly until they have internalized the patterns for real world success. The game environment provides a simulation that can be experimented with and tested. The computer simulation is much more flexible than live action role play drills and provides a space to experiment.

By articulating and prioritizing learning objectives the game developers, in each of the case studies in this chapter, were able to design mechanics that communicate those objectives using procedural rhetoric. In each case study this process enables the game to deliver nuanced ethics-oriented messages. For example, in *SurgeWorld* the player faces difficult ethical choices about how to spend limited resources in the face of overwhelming casualties. By allowing the player to practice this emotionally demanding task in the safety of the game she becomes better equipped to make ethically acceptable choices in the event of a real disaster.

3. EMBRACE PLAYCENTRIC DESIGN

The hardest question in game design is: "What does the player *do* in the game?" This is challenging because it requires the designer to translate open-ended concepts into a codified system of objectives, rules, procedures, and resources. It requires the designer to take complex and nuanced phenomena and distill them a small set of inter-operating variables. When put in motion, or played, this system must simulate the topic being

Figure 1. The Redistricting Game – system response (© 2007 University of Southern California. Used with permission.)



studied with sufficient clarity as to communicate meaningful messages to players.

An effective methodology for developing original play mechanics is: (1) prototyping, (2) playtesting, and (3) revision. The book *Game Design Workshop* provides a detail primer for this process—calling it "playcentric design" (Fullerton, Swain & Hoffman, 2004). Playcentric design means placing the player at the center of the design process. The idea is to make a rapid, simple prototype of an interactive concept—typically constructed with paper—then test the prototype by allowing real players to play it, and then tweak the prototype in a next iteration. This process is repeated until the game achieves the desired results. The key to success is to start with something very basic and layer on features in subsequent iterations. Ideally each iteration will be inexpensive to make—requiring only a skeleton crew—and turned around rapidly. Paper prototypes typically beget digital prototypes, which can then evolve into the final polished software.

It is common for a team to go through dozens of prototypes and hundreds of iterations in this process. Many times whole prototypes will be scrapped to approach the problem from a different perspective. It is for this reason that original game mechanics tend to take longer to produce than established mechanics and thus they also tend to require larger budgets.

The most efficient teams will embrace this iterative process from the concept stage to the production stage to the quality assurance stage and even after the project has launched through online updates. Teams who understand how to keep their designs plastic and keep costs down during iteration will be better able to end up with successful designs. Data from the book *The In-*

novator's Dilemma shows the leading differentiator for ventures that succeed over those that fail: ventures that succeed retain enough resources to try multiple different directions before figuring out which one will actually function as a business (Christensen, 1997). This lesson also applies to game development. Keep costs low and reserve funds until the playable system of the game truly achieves the desired results with playtesters. Then and only then deploy resources to produce polished media.

Ideally, in a serious game, the answer to the question "What does the player do?" is the same as the answer to this question about the topic in real life. This approach was taken in all four of the case study games below. For example: what the player does in *Peacemaker* mirrors what real Israeli and Palestinian leaders do as closely as possible; what the player does in *The Redistricting Game* mirrors what redistricters really do; and so forth. In each of the examples the designers embraced playcentric design until the system was able to convey nuanced ethical messages reliably.

Mechanic Design Case Studies

Peacemaker

Asi Buraksays "[we are] all about prototyping, testing, getting feedback, and revising" (personal communication, November 10, 2008) The team started the process of building *Peacemaker* by making a paper prototype or a board game version. Burak and his colleagues iterated on the board game in successive versions and then translated to digital and made more successive versions. The team tested first with SMEs and then with players. These tests revealed different things. SMEs from different constituencies tested the game for balance and realism. These differing opinions were relied on to see if the representations in the game were accurate and fair. Players, on the other hand, were relied on to see if the game was engaging and fun, and whether the learning objectives were being achieved. As a driving compulsion, Asi wanted to make a peace game with tension because (a) tension is engaging and (b) tension communicates a core learning objective of the game, in that the Israeli-Palestinian conflict is an extremely difficult and delicate situation wherein each action a leader takes has positive and negative consequences. For mechanics, the team decided on a structure of one action per turn and tested this in simple form with a simple set of options. From there they could layer on more options, tweak option, and then to layer in more and more sophisticated and realistic responses from the game. Tests started on paper prototypes and iteratively evolved to simple digital prototypes and then onto the final form of the game with polished media.

Tactical Language & Culture Training System

Lewis Johnson uses the phrase "learner testing" to describe his test process meaning he is playtesting to see if game is delivering the desired learning results he has defined for his games (personal communication, November 17, 2008). From a game mechanic perspective, players interface with the game using spoken commands. The team developed a play system wherein a spoken command is matched to a record in a database of pre-defined communicative acts. These communicative acts are akin to verbs in natural language. A player in a *Tactical Language* game learns how to perform appropriate communicative acts in the foreign language. The foreign language becomes an interactive environment for learning. To achieve this result the design team started with simple models of language acquisition, tested them, and then layered on features iteratively.

The Redistricting Game

The Redistricting Game started as a very rudimentary paper prototype. A 14x20 grid was created on a piece of poster board. Each cell on the

Figure 2. The Redistricting Game – initial paper prototype (© 2007 University of Southern California. Used with permission.)

grid represented a census block and included a number of Republicans and a number of Democrats. The cells were then labeled with a post-it note of one of four colors. The groups of colored post-it notes represented four different congressional districts in an archetypal state. Playtesters viewed a whiteboard that showed a summary of the Republican and Democratic populations in each district. Playtesters were given an objective to gerrymander the state to change the balance of Republican or Democratic representatives. The playtesters acted simply by changing the colored post-it notes on the board and then viewing an updated summary on the whiteboard. This prototype was created during the second week of production with a crew of two designers and two grad students. (See Figure 2)

When played for the first time, this simple prototype created an intense three hour play session and debate during which playtesters were searching online about the U.S. Constitution, passionately arguing the meaning of representative democracy, and lying their heads on the table bemoaning the fact that their Congressional votes in real-life did not matter. The SMEs in the room marveled at how quickly the playtesters were adopting the most sophisticated real-world gerrymandering tactics—despite having no training in redistricting. From this simple beginning, several additional paper prototypes were created to model other aspects of redistricting. Then the team created multiple digital prototypes—first using Microsoft Excel, then many versions in Adobe Flash. Ultimately, the Flash prototypes were extended to layer in all of the relevant features of the topic, including responses from different virtual constituents, a whip count, and a complete approval process for the state legislature, governor, and the courts. On several occasions whole features had to be cut and a new direction pursued.

This process of successive testing and revision continued until the day the game was released online.

SurgeWorld

SurgeWorld also began as a board game prototype. It was played initially by SMEs who were real

hospital staffers. The board game version quickly evolved into a digital prototype. Simple scratch art was created to represent the different aspects of the hospital, staffers, and patients in the digital prototype. The game required the team to perform multiple rethinkings of the core mechanic, including versions that resembled real-time strategy games like *Starcraft* and different versions that resembled resource management games like *Build-A-Lot*. The team kept media production costs to a minimum until the prototypes were working smoothly and the desired learning objectives were being achieved.

In conclusion, the prototyping and playtesting-oriented process that is central to playcentric design enables developers to hone in on mechanics that achieve a procedural rhetoric that communicates nuanced ethical messages quickly and at low cost. Each of the games listed in this section embraced rapid iteration as a key strategy for success.

4. LEARN FROM LEARNING SCIENCE

Developers can benefit greatly by including education consultants who have expertise in the science of learning in the game design process. Doing so can increase the chances that the game will communicate the desired objectives.

As mentioned, dozens of learning science frameworks have been published to date. In aggregate, they suggest that the most effective learning environments are problem-based. Researcher Robert Gagne developed a process called the "Events of Instruction" that is foundational in the field of instructional design (1985). According to Gagne's framework, instructional media should first gain the learner's attention. Second, it should inform learners of their objectives. Doing so provides the learner with a clear sense of purpose and thus will lead her to make meaningful choices in the game. When a player does not know their objective then they are typically not as engaged and will lose interest. Third, according to Gagne, the media should incorporate opportunities for the user to practice skills (1985). Digital games are particularly well-suited to allow players to practice in a safe environment that can be utilized at any time without costly set-up or coordination.

Dr. Richard Clark, a learning scientist, has served as an education consultant on serious game projects for USC's Institute for Creative Technologies. Clark developed a model called "Guided Experiential Learning" that is well-suited for application to digital game design. Clark's research shows that effective instruction needs: (1) authentic problems, (2) illustration of how the problem can be solved, (3) opportunity to practice and receive feedback, and (4) connections to prior knowledge. Clark's research shows that appropriate application of the Guided Experiential Learning model can increase learning by 35 to 50 percent in comparison to traditional models (Bennett, 2008).

Mechanic Design Case Studies

Each of the four case study games in this chapter—*Peacemaker*, *Tactical Language*, *The Redistricting Game*, and *SurgeWorld*—utilize concepts espoused by Gagne and Clark. For instance, each game presents the player with authentic problems to solve and each provides clear objectives to the players. All of the games enable extensive opportunity for practice and provides contextual feedback throughout the play experience.

5. MAXIMIZE CREDIBILITY THROUGH USE OF OBJECTIVE INFORMATION

Objectivity in media means presenting facts over opinion. The concept of objectivity is controversial because all media is created from some point of view. Serious game developers, like journalists and documentary filmmakers, can increase the

credibility and persuasiveness of their work by striving for objectivity as much as possible. Games that translate facts and data from the real world into system variables can inherently make more persuasive arguments than those in which variables are derived from creative judgments. Take the videogame *Madden 2009* (which is an NFL football game) for example: in this game the statistics of the virtual football players are taken directly from the statistics of the real football players. This means that Indianapolis Colts' quarterback Peyton Manning's real-life passing percentages are applied when a player uses a virtual Manning in a game session. In this example, the abilities of the players provide increased credibility over fictitious statistics. Objective information is also useful for maximizing the credibility of ethical messages as is illustrated in the examples below.

Mechanic Design Case Studies

Peacemaker

Asi Burak made objectivity a top priority in *Peacemaker*. One technique the team utilized was to incorporate playtester feedback from many people on each side of the Israeli-Palestinian conflict. *Peacemaker* posed a challenge here because value judgments about either side could not be made in the game. For instance, system text cannot refer to a group such as Hamas as a "terror" group because that view is not shared by both sides. Or, as another example, the team had to figure out how to use words like "attack" in a way that does not offend either side (A. Burak, personal communication, November 10, 2008). Finally Burak and his team decide to use real news photographs as media from the game. Thus, if a riot occurs in the game, then a photograph from a real riot in Israel is displayed. This use of journalistic imagery is a powerful dramatic technique for reminding players that the game is based in reality. Finally, Burak points out that the game espouses a two-state solution to the real conflict. This is the point of view of the game makers and many people on both sides of the issue, however, it is important to note that the game does not validate points of view that call for a single state solution to the Israeli-Palestinian conflict. This is a clear case of ethics designed into the procedural rhetoric of a game. To minimize potential criticism stemming from this message Burak published his design assumptions upfront to provide as much transparency as possible.

Tactical Language & Culture Training System

Tactical Language & Culture Training System uses the accepted rules of the language—such as vocabulary, grammar, syntax, in the design of the *Tactical Language* games (e.g. Arabic, Pashto, etcetera). In other words, the rules of the game mesh with the rules of the language. As a player masters the game, she also masters the language. This is an example of translating factual, objective information into a game system.

The Redistricting Game

The Redistricting Game is designed to provide objective information to its players. The issue of redistricting reform is not favored by the political left or right (each side uses the laws in the same ways for their own gain) and thus the game is non-partisan in its underlying data. Each mission in the game can be played from the point of view of the Republicans or the Democrats. The underlying system variables are the same in each mission regardless of party—for example, the Mission 1 map is identical for Democrats and Republicans. The only difference between playing as one side over the other is the names and artwork on the characters and in the jokes told by the game. For example, the Republican names and jokes poke fun at conservatives and Democratic names and

jokes poke fun at liberals. However, the number of jokes and the tone of the jokes are balanced to be the same for each side.

Quotes from real Republican and Democratic politicians also appear in the game, but they always appear adjacent to one another in pairs. For instance, the home page of the game includes adjacent quotes from prominent conservative pundit, Norm Ornstein, and former Democratic National Committee leader, Les Francis. The rules in the game are taken directly from the laws of congressional redistricting that are used in almost all U.S. states. When all of these objective aspects are put into play, the game creates a balanced view of the topic. These design choice were made by the team to maximize the credibility and persuasiveness of the game.

SurgeWorld

SurgeWorld uses real California hospital operation doctrine to inspire the underlying rules and procedures in the game. That said, the design team still had to figure out how to translate the doctrine into something accessible and fun. For instance, the team had to decide who the player represents in the game – i.e., a doctor, nurse, patient, or incident commander. After several experiments, it was decided that the player should not represent a single group but rather make choices for all units in the game. This way the game can illustrate the interrelated roles, responsibilities, and challenges for each constituency. This is another case of the game communicating ethics-oriented messages.

In conclusion, use of objective information such as facts and numbers is a technique for increasing credibility and the persuasiveness of an argument. Objective info can be derived from ethical standards and used in a design as well. For example, ethical standards are often found in the laws – e.g. it is illegal to drink alcohol before age 21. By foregrounding objective information in game system designs developers can increase the educational power and impact of their work.

6. FORMALLY ASSESS LEARNING

Nearly all serious games are designed to impart real world knowledge to the player. Serious game developers, however, typically do not collect data for learning assessment. As a result they typically do not know what, if anything, the players are actually learning. This attitude is changing because funders today are starting request assessment plans.

Richard Wainess of UCLA's National Center for Research on Evaluation, Standards, and Student Testing (CRESST) points out: scientifically sound learning assessment for games is a new area of research. Assessment in dynamic environments requires more sophisticated statistical models than those used in assessments of linear media. In a dynamic environment, techniques such Bayesian networks and hidden Markov models may need to be employed (R. Wainess, personal communication December 16, 2008). Hidden Markov models can be used to find and measure patterns that appear over a space of time (Rabiner, 1989).

Developers can benefit from hiring consultants and/or partnering with groups, such as CRESST, who understand learning assessment in a dynamic environment. Sound assessment techniques will yield hard data that shows the degree to which players are learning the game's intended messages.

A core aspect of assessment methodology is to: (a) test knowledge of the topic in the player before exposure to the game, (b) have the player play the game, (c) test knowledge of the topic, such as the ability to perform tasks, understanding of core concepts after playing the game, and (d) compare the difference between the two tests. This can be accomplished by selecting groups of test subjects who take tests before and after exposure to the game.

In conclusion, including assessment experts on a team can positively influence the design of the game. For example, they will want to measure the degree to which learning objectives are com-

municated to the player. This will push the team to design learning objectives that are, indeed, measurable. Integrating assessment experts also comes at a cost in efficiency, because developers and assessment personnel are not practiced at collaborating together and typically have very different work cultures. Game developers who embrace this idea will push the envelope in an important new frontier in the field of games.

FUTURE RESEARCH DIRECTIONS

Talking about music is like dancing about architecture (Elvis Costello, as cited in White, 1983)

Elvis Costello's quote cleverly illuminates the lack of fidelity that comes with describing the nuanced, temporal, aural medium of music with mere words. The same can be said for trying to use words to describe our nuanced, interactive, multidimensional, experiential medium of games.

A first order of future research into mechanics for serious games will be to better understand playable system design. As Michael Mateas and Andrew Stern point out in their paper "Build It to Understand It," building games provides a powerful and unique method for researching and understanding games, beyond what can be understood by writing about games alone (Mateas & Stern, 2005). In other words, building games is a research mechanism for pushing our medium forward.

The serious games development community is, by nature, expanding our medium. Each of the case study games in this chapter—and a handful of other games in the field—break new and important ground. Why? Because each of those games has custom-designed mechanics that communicate messages as the player takes action in the game. As was alluded to in Henry Jenkins *Games to Teach* research findings, a leading problem with serious game development is a lack of custom-designed game mechanics that communicate learning objectives effectively (Jenkins & Hinrich, 2004). Designers who wish to further expand the medium should heed this and focus on acquiring the ability to design custom mechanics.

Acquiring this ability will require new levels of sophistication and collaboration for serious game developers. Game development for entertainment games already requires knowledge of game design, software development, media production, QA testing, management, and other specialized issues. Adding new layers of specialized knowledge for serious game development illuminates the need for even more multifaceted collaboration skills. It is for this reason that this chapter recommends incorporating multiple SMEs, learning science experts, and assessment experts into serious game productions (as opposed to suggesting that developers build those skills personally). Specifically, this means allowing each of these disciplines to bring their expertise to the production in a way that impacts the design of the playable system. For instance, SMEs can illuminate developers on how a real-world phenomenon works so it can be better translated into the mechanics and core messaging of the game. Likewise, learning science experts will help developers see the impact they are having on players in a codified way. This knowledge will push the developer to keep tweaking mechanics until learning science conclusively shows how much players are learning. The field of game design needs developers who make breakthroughs in mechanic design to truly move serious games forward.

CONCLUSION

Serious games are in their infancy today, but have potential to provide great benefit to society as learning devices in the future. Games are well suited to communicate nuanced ethical messages because – unlike linear media – they allow the user to experience acting in ways that are socially

acceptable and socially unacceptable. Through this player-action / system response loop the player learns what is ethically appropriate in a culture. Breakthroughs in the understanding of playable systems, learning science, and the science of assessment will all need to be embraced by our community to reach for this potential. Developers who overcome the elusively difficult challenge of crafting game mechanics that communicate learning objectives through play will lead the way to this future.

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Chapter 15
Applied Ethics Game Design:
Some Practical Guidelines

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ABSTRACT

This chapter presents a case study of the design and development of two original ethics games entitled Veritas University and Knights of Astrus. Through this case study and a review of relevant literature, the authors explore the content creation of, and theoretical rationale for, the design and development of ethics games. Both games use the Adobe Flash® platform and are geared toward an undergraduate student audience as casual games to be completed in a few hours of gameplay. To ground the development of these games, the authors review contemporary research on identity, cognition, and self in relation to video game environments; they also argue for the need for further research and development in this area. From this literature base and their applied design experiences, the authors offer six guidelines as practical suggestions for aspiring ethics game developers.

INTRODUCTION

Designing games for education presents a number of challenges arising from the need to seamlessly incorporate learning content into an engaging interactive experience. Designing games for teaching about ethics is perhaps a more complex process given the inherent ambiguity that arises when there are not necessarily "right" or "wrong" answers and responses can be largely contextual and based on personal value systems as well as situational factors. Such is the challenge associated with the question of learning in applied ethics, a field attempting to more directly address social problems from a moral standpoint via the philosophical method (e.g., Bayertz, 2003). These challenges motivate our chapter, and we use them as a stepping off point for the following set of questions devised to help bound the complexity inherent in developing games for applied ethics:

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- What types of design approaches are most useful for teaching or exploring ethical content?
- How does one begin the task of designing an applied ethics game with limited resources?
- Is it better to start with a strong story, a capable technology base, or fun and interesting gameplay mechanics?
- Do the core gameplay ideas come from existing ethical scenarios that can be translated into a more interactive form?
- Should ethics games use pre-developed scripts, or include some mechanism for players to author their own ethical scenarios based on issues from their own lives?
- How can we conceptualize the notion of player identity so that actions and behaviors in the virtual domain are also useful in the real world?

In this chapter we recount the lessons learned from our own experiences in building two different types of ethics game projects to explore these questions. We hope these experiences will offer useful information and some practical guidelines for other ethics game authors in various stages of conceptualization and development. Before exploring our case studies, we present an argument for games as useful vehicles for teaching ethics.

BACKGROUND: A BRIEF ARGUMENT FOR APPLIED ETHICS GAMES

The idea that computer games can be viable tools for learning has been discussed for several decades, starting with the often-cited work of Malone (1981) and his research with game variants and intrinsically motivating game features. Since then, games have progressed rapidly into forms that would be largely unrecognizable by some of the pioneering video games researchers in the 1980s. Modern games—from role-playing games to first-person shooters - now offer a much more visceral and immediate experience for the player, especially in light of the new affordances allowed by the first-person perspective. For example, Dickey (2005) writes, "the shift from an outside orthographic perspective to a first-person agent embedded in the game space marks a shift in moving the player from outside of the game into becoming part of the gaming environment" (p. 71). From this, it is plausible that games with ethical dimensions are more likely to be impactful through the use of these new immersive technologies. We observe ethical aspects of gaming when players are asked to consider the principles of morality or experiment with different value systems as they play. These aspects materialize through players' decision making in modern games such as the *Grand Theft Auto* (Rockstar Games, 1997-2009), *Fallout* (Black Isle Studios and Bethesda Softworks, 1997-2009), and *Fable* (Lionhead Studios, 2005-2008) series. Many of these games are explicitly designed with multiple pathways (and not always a simple "good path/evil path" binary dichotomy) to success so as to encourage players' nonlinear explorations, feelings of authorship, and desires for replayability.

Unexplored Territory

Despite the commercial success of the games listed above, applied ethics games remain largely unexplored as tools for teaching for learning. This is unfortunate because they potentially offer rich, personalized scenarios for exploring humanity in new and interesting ways. As Bogost (2007) notes, video games make claims not about what it is like to be a machine, but rather about what it is like to be human in different types of unusual situations and embodied circumstances (e.g., as a Greek god, as a plane crash survivor, or as an anthropomorphized hedgehog). Despite its technological underpinnings, then, the act of playing video games is fundamentally a human

activity, and one with various social dimensions that encourage different types of interactions (e.g., human vs. computer, human vs. human, human cooperating with computer, human cooperating with other humans). Given this inherent property, it only makes sense that the computational tools used so seamlessly in business and entertainment might also be useful in a variety of ways to examine more humanistic issues such as the nature of being human or the exploration of personal value systems.

Although not always expressly designed as games, we are beginning to see examples of these humanistic and reflective tools through initiatives such as the *Virtual Philosopher*, a tool for Socratic exploration and inquiry used in online courses (Hornsby & Maki, 2008; see also the *Virtual Philosopher* web site at http://web.uncg.edu/dcl/courses/viceCrime/vp/vp.html). Here, interaction is employed at a rudimentary level, but one which still offers a pedagogically sound means to enhance the understanding of ethical decision making. Despite the potential of games for use in this domain, only in the past few years do we see video games beginning to be seriously considered in traditional humanistic areas such as the study and consideration of ethics.

Given the potential of first-person perspective to enable learning via exploration of these alternative pathways, a particularly interesting question is whether in-game playing can influence out-of-game behaviors. Can virtual experiences be constructed that encourage ontological contemplation both inside and outside of virtual worlds? Or, to get to the heart of the matter: is making video games to teach applied ethics a feasible and worthwhile pursuit?

Interactive Risk

The rich interactivity of games and their potential for encouraging players to take risks provide compelling arguments for using games as tools for teaching about applied ethics. Many scholars acknowledge that interactivity is an essential property of games that makes them unique as procedural representations of the world. These representations are co-authored by players in various ontological configurations (Murray, 1997; Ryan, 2002; Bogost, 2007). As participatory and procedural representations of an authored world with boundaries—and some degree of freedom with which to explore or test those boundaries—games allow players to participate in, rather than just witness, the unfolding of actions with ethical significance. These games function in the "methetic," rather than "mimetic," sense (Huizinga, 1955, p. 15). Simply put, gamers want to do, not just watch.

Video game players also often have emotional connections to their games and the gameplay experience. As participants, they have vested interests in and connections to the virtual characters they inhabit and the environmental objects they interact with. Arguably, these subjective factors can make ethical principles more relevant and memorable than simply reading about these concepts in an ethics textbook or working through case studies on a worksheet. Furthermore, games offer safe grounds for exploration under the learning principle of the "psychosocial moratorium" (Gee, 2007, p.59), a term borrowed from Eric Erikson (1968) to describe an environment in which the consequences of risk-taking are minimized. As Rouse (2005) notes in his analysis of the oft-discussed game *Grand Theft Auto III* (Rockstar Games, 2001), the game is successful because it allows players to explore taboo activities in a safe environment. While many people would never do these things in the real world, he notes, the game-world encourages players to take risks. Rouse asks, "in the safe context of a game-world where the worst consequence is having to start your game over, who wouldn't want to try it out?" (p. 476). Opportunities for risk-taking, trial-and-error exploration, and emotional engagement are all

available and useful for the ethics game designer who wants players to explore unfamiliar and perhaps even uncomfortable moral territories.

Toward a New Genre

From this brief analysis, we can extract several different possible reasons for building ethics games. First, as an underdeveloped subject area in game design, the investment in additional time and effort is bound to yield some exciting humanities projects with which to examine morality and the human condition. Even if such efforts are spectacular failures, they are bound to at least open up new areas of research related to simulation and ethics.. Second, by allowing players to become co-authors of interactive experiences, we can potentially access deeper levels of cognition, emotion, and reflection by allowing them to have some vested interest in the simulated activities through their own idiosyncratic creative processes and problem solving techniques. Finally, by providing a safe environment in which to test moral decision making and emotional responses, and within which to examine the simulated consequences of those decisions, we provide a sandbox for the observation of behaviors and actions. We can also use these games for studying the relationship between virtual identities and the self. This issue, however, is a complex issue deserving closer attention.

IDENTITY, COGNITION, AND THE SELF IN ETHICS EDUCATION

We can further support the theory and utility of games for ethics education by studying the relationship between virtual identity, cognition, and the self. One of the most important questions relating to pedagogical game design for ethics content considers the transferability of learning from a virtual world to the real world environment. If learning is to occur that is useful outside fantasy-based environments, it should transfer from the simulated realm of computer games to the real world in which problems of that type are likely to be encountered. With many types of learning games, the issue of identity is interesting, but of lesser importance. For example, solving a mathematical problem as a scientist in the year 3018 to help refuel a stranded rocket is going to be very similar, mechanically speaking, to solving that same problem as a college undergraduate student in college algebra during a timed exam. When the mechanical knowledge of how to solve such a problem is the primary learning objective, then it does not much matter how interconnected the virtual and real identities may be once the player moves out of the game space and back into the real world space of being an algebra student.

When the particular learning topic concerns ethics, however, the question of transferability is in large part determined by the relationship between a real and a virtual identity, what Gee (2007) has referred to in one direction (from the real to the virtual) as the "projective identity" (p. 57). If the virtual identity is encapsulated neatly and wholly by a medium, then it is difficult to argue that matters of the self can be adequately addressed through the creation of a computer game, regardless of how cleverly that game is designed. What happens in the game-world affects only the virtual self and no trace of that experience leaks out into the real world. If we make the argument that the real and virtual identities are entirely separate, that means that the virtual identity is engaged only when the player begins a game and that it ends when that game ends, neatly retaining any experiences within the game-world as part of its constitution. These properties are then reactivated when the next gameplay session resumes. If this relationship between identities is entirely separated in this fashion, if one leaves the real identity behind and engages the virtual identity during a gaming session and reverses this practice when leaving the game, then the relationship is trivial and not very useful. One could argue in this case that any learning gains are primarily

limited to either the virtual or the real identity. For example, learning in the virtual world will benefit future virtual encounters while real world learning will not be of much use in the virtual world where rules of various kinds (e.g., physics, social dynamics, biology) may or may not be anchored in the realm of what is possible and likely. Thus we may be able to teach concepts at the level of declarative knowledge and factual recall, or even inference, but truly reaching the self in a manner that encourages players to be introspective and thoughtful about their own identities and values seems much more difficult.

On the other hand, if the relationship is one in which the virtual and the real identities meet at some point, perhaps at an instance in which narrative transportation (e.g., Green, 2004) or some other immersive technique has established a suitable degree of presence within the game-world, then developing more sophisticated ethical thinking in video games—knowledge which may include synthesis and evaluation of content rather than just comprehension, for example—seems more feasible. Just as presence has been defined as the overriding of one's awareness of a primary environment (e.g., real world) by a secondary environment (e.g., game-world) (Slater, 2002), so might the virtual identity gradually take priority over the real identity (e.g., a player ignores the need to tend to his grooming needs and real world socialization activities until his avatar has finished leveling up a certain attribute or an in-game conversation has finished). Given this phenomenon where a virtual identity can take priority over a real identity, might it also be possible for that virtual identity to be powerful enough to have subtle influences on one's real world conceptualization of oneself? Gee (2007) has already noted that this process routinely occurs in the alternate direction, where we "feel responsible for a character" (p. 58) and project our own beliefs and values onto our virtual characters, as he himself did when playing his character Bead Bead in the game *Arcanum* (Troika Games, 2001).

If we accept this outcome as a possibility, we acknowledge that what one does in the virtual world will affect, though perhaps only subtly, how a person considers new variants of that virtual situation when it occurs in the real world. This continuous model offers more hope for ethics game designers as it states that there is at least some degree of engagement with the self during gameplay. Such engagement might take into account one's bodily interactions with the game-world through positioning of the body and use of the controller as well as cognitive processes engaged and activated by body and brain when solving problems and interacting with different types of content in the virtual domain. Understanding identity as a construct that takes into account the body and the environment is helpful here.

A focus on the importance of one's holistic environment in understanding identity leads to a contemporary notion of self that is explained by Clark and Chalmers (1998) in their well-known essay that introduces the extended mind thesis. According to this perspective, the mind is dependent on other scaffolds such as environmental aids (e.g., calendars, calculators, or computers) that require the brain and body to work together "in tandem with the external environment" (Cogburn & Silcox, 2009, p. 13). This argument suggests that the environment actively drives cognitive processes, meaning that a video game can potentially drive thinking about values and examining ethics in a meaningful sort of way. Specifically, cognition does not occur in a vacuum, but rather within a task or behavior (see Clark, 2001; Hutchins, 1995; Rowlands, 2003). The emphasis is on the practice of cognition "by which internal representations are incomplete contributors in a context-sensitive system rather than fixed determinants of output: and they too focus on the ongoing interactive dance between brain and world" (Sutton, 2006, p. 282).

Clark and Chalmers (1998) even use a video game-like metaphor to explain their hypothesis, suggesting that a person might play a game

similar to *Tetris* (Tetris Holding LLC, 1985) in a variety of ways. First, she might sit down in front of a computer and answer questions to fit shapes into variously sized sockets. To determine which shapes would fit into which sockets, she would "mentally rotate the shapes to align them with the sockets" (p. 7). Or, she might perform the same operation by choosing to physically rotate an onscreen image to gauge the fit against sockets. As anyone who has played *Tetris* knows, this gains the player a sizeable advantage in speed as she can quickly permute a puzzle piece into a variety of shapes much more quickly than she can do the operations in her head. Finally, the *Tetris* player of the future might be able to use a neural implant to perform rotations as fast as the computer in the second example. From a cognitive perspective, Clark and Chalmers ask, what is the difference between these three processes? The first and third examples seem intuitively similar, and as the second and third examples are also similarly computational (the difference being that the second player uses a computer for this process while the third player in the future computes internally via a neural implant) they question the judgment of claiming that cognition ends at the boundary of the skin. They note that many types of cognitive processes (e.g., pen and paper for long multiplication problems, physical rearrangements of tiles in *Scrabble*, books and diagrams, etc.) have long been used in various types of thinking processes, so why not consider other external media such as computers and video games in the same way? Their primary argument is simple: "cognitive processes ain't (all) in the head!" (p. 8; see also Clark 1997; 2001).

A summary of this work in identity and cognition presents us with two useful observations. First, in an immersive and well designed game, players care about their virtual identities. Since they care about their virtual identities, there is an opportunity to design games which challenge the player's moral values and to study the degree to which virtual games impact real world identities. Second, players can be conceptualized as using games to think by scaffolding or augmenting existing internal mental processes with external, environmental aids. These aids could certainly be gaming hardware (e.g., controllers), but as we argue, players also augment cognition through their external manipulations of virtual avatars in fantasy-based worlds. While the graphical manipulation occurs outside the player's body, the consequences of the avatar's virtual actions are internalized and integrated as the player thinks about what she is doing. Continuous feedback from the game means that a player can quickly adjust her mode of thinking as game events occur. For example, the body language of non-playable characters (NPCs) may subtly influence the player to adjust her thinking as she interacts with them and attempts to work through a moment of conflict. The action occurs outside the player, but the immediacy of feedback serves to augment thinking even as it unfolds. This means that in the realm of teaching applied ethics, where a goal might be to challenge students to think about the implications of different actions in regards to different ethical codes and principles, games are potentially just as useful for applied ethics as graphing calculators are for trigonometry. As cognitive aids that allow students to safely experiment with different behaviors as they act out different roles and are portrayed by different avatars, they offer interesting possibilities for pedagogy.

From Theory to Design

If we are to accept the conclusions reached by Clark and Chalmers (1998) regarding environment as active in cognition as part of an extended mind model, and if we can accept the ideas offered by theorists such as Cogburn and Silcox (2009) who see personal identity as a connected and continuous experience that can extend into virtual worlds, then there is some hope to the quest for building workable and impactful ethics learning games. Like more mature technologies such as pen and

paper, video games provide us with extended ways of thinking and encourage embodied cognition. The difference is that this happens in kinesthetic relations with the controller, as opposed to physical activities such as chewing on an eraser to focus one's thoughts, or twirling a pencil before writing to relax one's mind for a creative sketch. Unlike these physical technologies, though, video games also allow us to experience virtual embodiment; by way of graphical, symbolic representations; as we interact with procedural worlds. These procedural worlds can be authored to allow players to consider ethics in various ways. More importantly, we can make the claim that such experiences will allow players to take something away from that virtual world and to incorporate those experiences into their real world identities, value systems, and senses of self. The next question then becomes one of applied design: how does one build such an ethics game with this goal in mind? More specifically, which types of game mechanics, design strategies, and learning environments will afford players with the proper opportunities for blending real and virtual identities for the purpose of learning about ethics?

In the next section of this chapter, we consider and address these questions by describing our experiences in building two types of ethics games, the first originating from a series of preexisting narrative scenarios and focusing on a narrow subset of ethical dilemmas, and the second beginning with traditional RPG game mechanics and no predefined expectations for how the story should unfold. With both efforts the goal was to build an immersive game-world with interesting scenarios capable of engaging players' awareness of their moral values and leaving a lasting impression. Both efforts produced radically different results. After briefly discussing each of our ethics games, we return to this question of applied design by distilling the lessons learned from our experiences into six guidelines for prospective authors.

OVERVIEW OF CASE STUDIES

The first game we discuss, *Veritas University* (*VU*), was developed for incoming college students and based upon the existing work of designers at *EthicsGame.com*. *EthicsGame.com* delivers ethical training scenarios to various clients through Internet media. This project involved a translation of existing hypertext scenarios (in narrative form) into a more interactive, game-based form. *VU* contains two scenarios, one dealing with plagiarism and the other dealing with how to handle an inconsiderate roommate. The game brings the player through a careful consideration of the ethical issues as organized by stakeholders, duties, and particular foci (e.g., "rights/responsibilities" or "results" lenses).

We designed the second game, *Knights of Astrus* (*KoA*), more with the gameplay mechanics in mind than the initial narrative scenarios. In this project, the design team borrowed from existing commercial games that explored ethical dilemmas, such as the popular commercial titles *Fable 2* and *Fallout 3,* and attempted to replicate some of these mechanics on a much smaller scale. The Office of Information Fluency at the University of Central Florida (UCF) funded *KoA,* which was proposed as a game to help college undergraduates become more comfortable with uncomfortable ethical situations. In building this second game, our aim was to introduce learning opportunities in the domain of applied ethics to a humanities learning game with an audience of college-age students. Our goal in this game was not to be prescriptive in terms of ethical content, but rather to encourage players to make tough decisions that would require moral reasoning. This reflection could later be articulated using an in-game journal.

Design and development for both games was led by the first author, whose background is in digital media, and involved collaboration with faculty from ethics and cognitive science. Development of the games involved a team of

undergraduate students from a variety of majors and skill sets—ranging from artists to programmers to producers—and took place over the course of several semesters at campus-based computer labs.

Game 1: *Veritas University*

Overview

Ethicsgame.com is an online portal with a variety of ethical training materials focused in different areas such as healthcare, student life, and business. The slogan of the game, "we've taken the 'ick' out 'ethics,'" speaks to the aim of the developers to make learning about ethics more fun and engaging. Baird's book *Everyday ethics: Making hard choices in a complex world* (2005) provides the methodological framework for the web based system. The original content of *ethicsgame.com* is text-based and reminiscent of early text adventure games like *Colossal Cave Adventure* (Crowther, 1976) and *Zork: The Great Underground Empire* (Infocom, 1980). Text-based prompts and online forms lead the player through various scenarios in which they must make decisions that then influence subsequent information presented to them later in the scenario.

Our team was awarded a contract to build a graphical experience for visitors that would reimagine the existing textual scenarios of *ethicsgame.com* in a virtual, interactive environment. We were tasked with creating two different animated game levels, each focusing on a different area. These two areas involved ethical dilemmas of plagiarism and dormitory room etiquette.

Creating the Environment

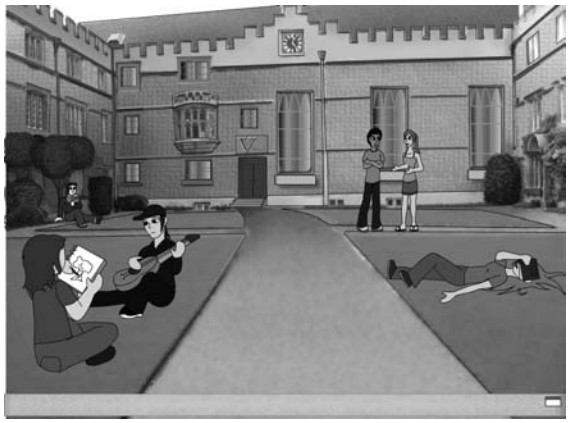
Our first mission was to graphically create the environment described in the original online scenarios and build an artistic representation of this environment to be navigated from a first person perspective. We chose to use a 2D rather than a 3D representation primarily for the sake of time (the game was produced in a single 16-week academic semester). Although we already had a preliminary narrative script to employ, the script required major adjustments to better fit the virtual environment presented in the game-world. Our graphical portrayal of Veritas University, the fictional location in which the scenarios of the game take place, was therefore an important step in our move to create a more immersive experience for the players of *ethicsgame.com*. We created several different 2D interactive environments such as a courtyard, professors' offices, a library café, residence halls, and interior dorm rooms. Our aim was to make the university setting as familiar as possible in order to encourage players' identification with their avatars and create an environment in which projective identity could function.

Setting the Context

VU begins with the game's primary narrator, Rian, explaining the gameplay instructions to the player (see Figure 1). The player takes on the role of a new student in the university. An initial scenario is explained in which the player's roommate, Mark, has been sharing his computer with the player throughout the semester. After using his computer to write a term paper, the player discovers that Mark has taken significant portions of the player's work and turned it in to another professor for another course. The player then proceeds through various interactive screens to identify the ethical problem, find stakeholders, determine duties and obligations to those stakeholders, and then make an eventual decision based on all available information. Along the way, the player interacts with various environments in a 2d fashion by clicking on characters and objects to gain additional information that may or may not be relevant to the task at hand. Navigation is accomplished by clicking navigational arrows to move through corridors and enter structures such as university buildings and residence halls. A central

Figure 1. Game Introduction with Rian, the Narrator and Guide

Figure 2. Courtyard in Veritas University



courtyard location (see Figure 2) allows the player to explore various parts of Veritas University.

After exploring the campus and gathering information, the player is prompted with an interactive form in which she must answer questions correctly to continue. If an incorrect answer is provided, she is debriefed accordingly as to why she chose the wrong option; in this case, the correct answer is revealed (Figure 3). In a basic type of ethical dilemma such as this, correct and incorrect answers were possible to gauge. While initial questions were relatively straightforward, questions later in the game were more nuanced and often required players to choose multiple answers or use a continuum to assess information contextually based on the stakeholders involved in a given situation.

Additional Design Mechanics

To assist the player throughout the game, we introduced virtual characters and interactive objects into our design. In the original textual scenarios, much information necessary to the player was built into an *Ethics Guide*, an online reference that could be accessed throughout the game. In *VU*, we included a mechanism to access the *Ethics Guide* information and a means for note taking (see Figure 4) as part of the player's toolset, but we also included a virtual ethics professor named Alice Tanner (see Figure 5) who guides the player in a more natural way, without breaking the flow of the narrative scenario. Professor Tanner appears throughout the game in instances where the player needs additional information about strategies for

Figure 3. Feedback for Incorrect Answer

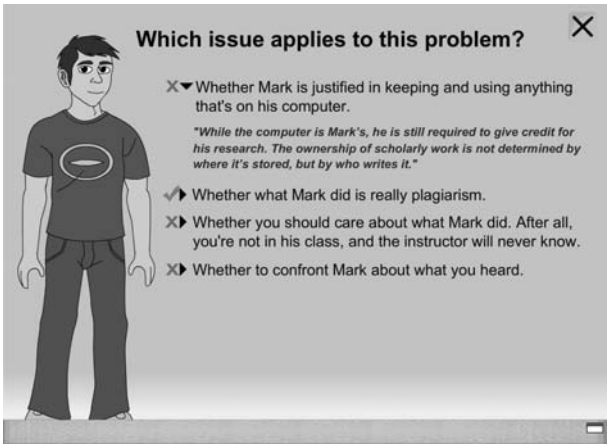
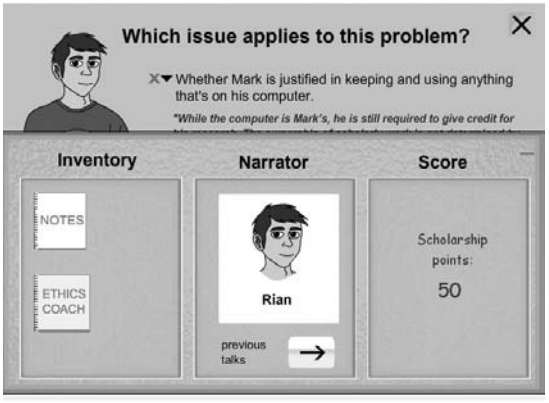


Figure 4. Game Toolbar



problem solving according to particular heuristics, such as a "rights and responsibilities approach." Similarly, we used scholarship points (also shown in the toolbar in Figure 4) to tally the player's score. This score is determined by the number of correct answers, the extent to which available information is consulted, and the player's ability to screen out irrelevant and incorrect answers. Professor Tanner also contributes a copy of the *Ethics Guide* early in the game that can assist with the player's decision making. It is the same information that is present in the original textual version, but in this case it has narrative significance as an authored document from a character in the game.

After visiting with Professor Tanner, Rian leads the player through step-by-step analyses of the ethical issues, which in the first scenario involve the aforementioned plagiarism dilemma and in the second scenario involve dorm room etiquette and one's duties to a roommate in terms of privacy and the right to a good night's sleep. In several instances, the player is instructed to research concepts or terms in the Ethics Guide *to explore certain information in more detail.*

Figure 5. Professor Tanner

Lessons Learned

Because we began the development of VU *with an initial story and a set of ethical dilemmas in narrative format, our primary challenges were in regards to making the scenarios more interactive. For this reason, we added additional virtual locations to explore, translated information from documents into character dialog, used voiceovers for speech animations, and developed an artistic style to make the university seem more lifelike. In the end, however, the game was not as engaging as we had hoped it would be, largely due to its reliance on menu-driven forms and the detailed assessment that was not hidden from the user. It proved quite difficult to translate the amount of information contained on the assessment forms into natural, lifelike interactions with the inhabitants of Veritas University. Assessment forms also served as breaks in presence that reminded the player she was expected to be learning about ethics rather than simply exploring a virtual world and becoming immersed in the dilemma. In fact, many of these forms would entirely halt progress in the game until the player provided an acceptable answer or number of answers; some of these forms required a fair amount of thinking from the player (e.g.,Figure 6). This was both a positive feature, in that it encouraged reflection, and a negative feature, in that it reduced the immersion of the game-world. Another problem we encountered that we did not realize until later was that Rian the guide would sometimes recite dialog that would have been more appropriate for Professor Tanner; when Rian showed an in-depth knowledge of ethical topics it sometimes accented the artificiality of his character. Prompts from Rian to consult with Professor Tanner or open the* Ethics Guide *for more information were less intrusive in terms of breaking the player's immersion (seeFigure 7).*

Game Ending and Next Steps

The plagiarism scenario ends by asking the player to make a final decision: either confront the roommate and allow him to explain what happened or turn himself in on his own, or bypass this conversation and report the roommate to his professor. The game then directs the player to a final debriefing with Professor Tanner (seeFigure 8), and then awards her with a final conversation and potential virtual scholarship given by an authority figure, Dean Nelson. The overnight guest scenario mirrors the same format, but with different content, different references to the Ethics Guide *materials, and different object interactions. Players receive various types of awards depending on the scholarship points total at the end of the game. Too low a score leads the Dean to admonish the player and*

Figure 6. Choosing Primary Stakeholders

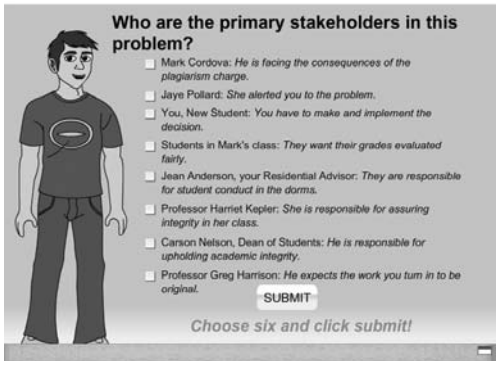


Figure 7. Vocabulary Prompts

encourage her to try playing through the game again with more attention to detail.

Additional data on VU *is still being collected and analyzed by the* Ethicsgame.com *business team; further modifications by our design team are likely to occur in the future. As a precursor to the more ambitious ethics game project,* VU *served a major role in helping us consider more engaging ways for the player to interact with virtual environments with ethical implications. With this game, however, it was clear that a deeply immersive environment with the potential to fully engage a player's sense of self and make her pay close attention to her implicit moral reasoning processes was not yet present.*

For our next project, we strove to create a more immersive and interactive experience with several variations. First, we wanted to use a fantasy environment to make the experience more novel and interesting. Second, we wanted to allow the player to customize her avatar so as to encourage identification with that avatar and foster the projective identity hypothesized by Gee (2007). Finally, and most significantly, we wanted to focus on gameplay mechanics to create a game that was fun to play and less dependent on preexisting ethical scenarios and form-driven assessment. While plagiarism and dormitory etiquette are issues many members of our student audience will face at one time or another in their lives, there are numerous other types of scenarios that can also be used as virtual pedagogical tools to prompt ethical discussions or promote awareness of real world events.

Figure 8. Final Debriefing with Professor Tanner

Game 2: Knights of Astrus

Overview

For our second game, we still wanted our players to have enduring relationships with their avatars and the game-world, but we also wanted to make the gameplay experience memorable and exciting. We wanted players to feel as though they were really playing a game rather than participating in a training simulation. The real and virtual would still be connected, but in this case, they would be mediated by a game with a focus on fantasy and role-playing. To help accomplish this, we began by placing the player in a science fiction-based environment with a tough problem to solve. *Knights of Astrus (KoA)* begins with a short cinematic sequence showing a space craft crashing into a gulch on an alien planet. Minimal exposition is given to the player as we want her to explore the alien terrain and its surrounding city to learn as much as possible about the environment on her own. We decided to implement a basic character customization function so as to give the player some sense of ownership and identification with her chosen character. While it only includes a few options for each facet, the customization system allows players to choose a gender and several different hairstyles and skin tones.

Creating the Environment

After watching the opening cinematic and configuring her character, the player is immediately placed in a playable environment. In contrast to *VU*, *KoA* uses a combination of both third-person perspectives for general area explorations and first-person perspectives for interior explorations and dialogue segments. Although the first level functions as a tutorial for the overall game, the player is not advised of this and instead learns the game mechanics as she navigates the gulch (using the familiar adventure gaming movement keyset made up of the letters W, A, S, and D), explores the buildings in the area, adds items to her inventory, and accesses the quest log. She is immediately advised of the lack of water on the planet, a fact that will have some bearing on her encounters with NPCs and the ethical dilemmas she will face later in the game.

Setting the Context

There are several ethical problems embedded in the gameplay experience of *KoA*. Because of our desire to place players in uncomfortable, but engaging, problem solving roles, we chose to include combat and conflict of various flavors. In the tutorial level, the player learns the combat

system by being forced to fight some guards who are questioning the player's presence on the planet. Unlike many enemies in role-playing games (RPGs), however, these guards have personalities and histories which are revealed through conversation. One guard is a bully; the other is being bullied. The player must decide what to do after the combat is finished. She can choose to kill the guards, tie them up and leave them, or let them both go. The fact that the player must choose the same fate for both NPCs is unsettling to the player and helps to set the tone that there are not always ideal solutions to the dilemmas one faces in the real world. In addition, later encounters in the game reveal the consequences of the player's prior decisions. Many of the ethical choices are made during conversation points in the game. Players are also able to hack into various computer consoles and electronic devices; the decision to hack opens a puzzle-like mini-game that increases in complexity depending on the strength of the device's security or the current level and its difficulty. We borrowed this mechanic from the commercial game *Fallout 3* (Bethesda Game Studios, 2008) and included it to vary the gameplay experience by introducing a variety of puzzles and challenges.

There are a variety of other ethical dilemmas embedded in the game, from seemingly minor incidents involving only a character or two to major problems that affect the entire game-world. In one scenario, the player comes across an animal trapped in a mechanical device and must decide whether to free the animal or leave it to perish. In another, the player explores a town and is offered a quest to steal a vase from a citizen or to help that citizen by performing a task and receiving the vase as a reward. The quest itself involves another decision; it turns out the citizen runs a dog-fighting ring from his basement, but the dogs have gotten loose and cannot be contained. Do you kill the wild dogs, at the NPC's request, or do you choose to set them free and risk being injured in battle?

Additional Design Mechanics

Additional design mechanics in *KoA* depend upon the specific context of particular scenarios. For example, at one point in the game, the player must enter an underground prison and free an NPC character who is also a member of the resistance movement on the planet, the Knights of Astrus. It turns out the planet is running out of water and the resistance movement believes the government is deliberately keeping water from the people. To free the agent who has information critical to the resistance, the player enters a prison only to find that the structure is collapsing. The player must take advantage of emergency escape pods (which require 8 humans to deploy and contain a maximum of 12 seats) to flee the premises. She can choose to rescue the other prisoners, or leave them to their fate. In addition, to complicate matters further, one of the prisoners is elderly and has a stroke just when the first pod fills to capacity. Do you choose to give up your seat to the elderly prisoner and hope the other pod fills, or do you leave him behind to wait and face an almost certain death?

After the escape sequence, guards emerge and the player is captured in the gulch. After being interrogated for a bit, the guards suddenly leave, and it becomes apparent that a bomb threat has occurred. In fact, it turns out that the resistance has made the bomb threat and that the Knights of Astrus are more fanatical than originally thought. In this scenario, the player finds herself free again and has to deal with the bombs somehow. She does not have much time to decide. With the help of a robotic augmentation system obtained earlier in the game, she can rescue a larger group of adults in an office building or a smaller group of children in another location (multiple bombs are spread out across the city). Or, she can just shield herself and let the bombs go off if she feels it is not her place to decide the value of other lives and she does not wish to put herself at risk with potential injuries from the bombs. The augmentation device projects

a shield around the player and some number of additional citizens, but its range is limited, which leads to the dilemma.

Lessons Learned

With this project, we found that a more complex gameplay mechanic still needed to be combined with planned checkpoints to ensure players encountered and completed the various dilemmas. We chose to focus on the storyline as a gating mechanism for moving the player through the environment. As with many branching storylines found in commercial games, the overall story of *KoA* is gated so that a single ending is eventually revealed. Regardless of how noble or heinous a player's actions are throughout the game, she is eventually rewarded for completing the game by having her ship repaired and being allowed to leave the planet. While there is a single ending, the way in which the player obtains the various parts is quite different depending on her in-game decisions and behaviors. These varying decisions and behaviors will serve as catalysts for the discussion of real world issues and ethical dilemmas as we move into the formal testing and assessment phase of this project.

Game Ending and Next Steps

The last major scenario, which ends the current version of the game, occurs after the bombs explode and the ground collapses in part of the city. The player falls beneath the ground and ends up exploring some catacombs. Eventually, she finds an underground lake, an important discovery in a world with water problems! The lack of a reliable water supply has contributed to the stress of the city's inhabitants throughout the game, and in the end, it is the player who decides what is to be done with the water. She can choose to tell the government, who has supposedly been repressing the citizens (e.g., imposing a curfew) and using military force, the resistance (who, in the prior scenario, revealed themselves to be fanatical killers), or the townsfolk, who may very well destroy each other in the fight to reach the water. A fourth option is for the player to simply pass the responsibility off on an NPC character, Bill Ten Thunders, who has earlier revealed himself to be a mentor character. He is also the mechanic who will eventually help you fix your ship.

To support replayability and long-term player involvement, we also designed this second project as a platform for students to develop their own scenarios using customizable tools within the game. To this end, we designed the game specifically with customization in mind to allow for other types of user-generated content to be added by students who wanted to "mod" the game. We anticipate that the map editor will also be used later in the development of the project as part of a toolset for user-defined content, or customizable levels in which players can create their own terrains, upload their own dialog trees, and ultimately develop their own ethical dilemmas using this toolset.

An analysis of the dilemmas used in *KoA* shows that various types of classical ethical conundrums are being considered in the game (e.g., the lifeboat dilemma; see Cohen, 2007). We believe these could be improved further by making the choices more difficult and impactful with consequences linked to future events occurring in the game. Many of these initial scenarios may end up serving as placeholders for more sophisticated scenarios that will be added after additional consultation with our ethics subject matter expert and playtesting groups.

GUIDELINES FOR FUTURE DEVELOPERS

In this final section we provide a brief summary of our lessons learned from these projects. Much of what we learned during the previous two years will be relevant to other ethics game developers.

Table 1. Guideline for developing applied ethics games

Define Learning Objectives	**Carefully articulate and consider the nature of learning objectives**
Strive for Balance	Identify an appropriate balance between learning content and player enjoyment
Playtest Frequently	Provide sufficient time to playtest the game throughout its development and playtest as early as possible
Include Detailed Assessment	Carefully consider the most appropriate methods for learning assessment and feedback
Build Opportunities for Projective Identity	Develop game characteristics to support connections between real and virtual identities
Consider Unique Content Creation	When appropriate, provide opportunities for user-created content

Rather than focusing on technological workflow procedures, we instead offer what we found to be the six most important lessons learned taken from these development experiences.

Consider Your Learning Objectives. First, before starting development on the game, and even before beginning scripting of the ethical learning content, carefully consider the types of learning objectives you want your players to meet. When planning *KoA*, we initially thought it would be useful for players to learn about different ethical models (e.g., egoism, altruism, or utilitarianism) and then to be debriefed on how their actions correlated to these models. After initial meetings with our philosophy subject matter experts, however, we adjusted *KoA* so that the game was more open-ended and simply allowed the player to make decisions. We then asked the player why she chose to behave in this fashion by incorporating a game journal that doubled as an assessment tool. In this way, we were learning about the player and her values while she was learning about the consequences of her decision making in the simulated world.

Balance Fun and Learning. Second, focus on a balance between learning content and fun. While it is easy to proceed enthusiastically in either direction, it is also quite easy to throw off the critical balance between a compelling experience and an experience from which one can learn. With *VU*, despite our best efforts, the game turned out to be a little bit too heavy on ethical learning content and somewhat light on fun gameplay. With *KoA*, in some sense, the reverse was true, since the final game mechanics were more polished than the ethical scenarios players face in the game. To accomplish this critical balance, gathering feedback from one's intended audience is important. This feedback is best obtained through giving your audience direct experience with your game.

Obtain Audience Feedback. Third, playtest early and frequently during development. Playtesting means allowing your audience to experience your game even before it is fully polished. Although we did not handle the playtesting directly for *VU*, we did present early versions of *KoA* to attendees at three different conferences during the first year of development. Feedback from these sessions was very valuable in shaping our decision to scratch the first year of development and begin anew with the lessons learned from this initial feedback. If possible, incorporate playtesting early in the design process and pay close attention both to what players find enjoyable and to what they end up learning from the experience.

Assess and Evaluate. Fourth, when designing games for learning, particularly for learning complex issues such as those associated with ethics, the nature of the assessment and feedback, and their delivery, is critical. For example, assessing the learner implicitly is obviously ideal. But the computational requirements behind such forms of dynamic assessment running in the background are formidable. Similarly, optimal feedback would be

delivered in such a way that it does not interfere with immersion in the game. Working feedback into the narrative game-flow requires overcoming challenges arising from story-construction and dynamic adaptation of story structure.

Allow Players to Identify with their Avatars. Fifth, consider the role of projective identity throughout the development process. As discussed earlier in the chapter, projective identity is the term Gee (2007) uses to refer to the relationship between one's real and virtual identity as one projects her own beliefs and desires onto the virtual character. If opportunities for the player to feel closer to her virtual character are built into the gaming system, such as the player customization and player feedback mechanisms built into *KoA*, there are some interesting possibilities for sustaining the learning process and improving identification in both directions, even after the game itself has ended. Similarly, if opportunities in the real world allow players opportunities to discuss, debrief, or even defend their actions in the game, then they are re-engaging that identity and recalling their decision making process to respond to this new challenge.

Consider User-Generated Content. Finally, take advantage of opportunities for unique content creation by your players. Although we are not yet in the position to do this fully with *KoA*, the parallel development of a map editor and the modular use of eXtensible Markup Language (XML) files for item placement and dialog make user-contributed content a possibility for the future. We imagine such tools being very useful for philosophy courses in which students are encouraged to apply the content from that course into creating their own variants of ethical dilemmas. User-created content is also helpful for extending the game into other areas that might have interesting ethical scenarios to consider (e.g., industrial/organizational contexts, discrimination, or international ethics).

CONCLUSION

In this chapter, we considered the self as a connective tissue woven between real and virtual space, an important positioning if we are to argue that the self is able to be influenced in a meaningful way in a video game environment. We then considered the design experiences of two different games, one solidly grounded in existing narrative scenarios but lacking in truly game-like mechanics, and the other designed with traditional RPG mechanics in mind and augmented with opportunities for player feedback. Although both games used the same core *Adobe Flash*® technologies, the overall experience of playing *Veritas University* is quite different than playing *Knights of Astrus*, and in neither game is the experience sufficiently drawn out so as to truly draw the player in and test her moral reactions on a significant scale. Despite this problem, it is important to note that both games were designed and funded with modest budgets, limited amounts of faculty oversight, and small teams composed largely of undergraduate majors in the humanities. Neither game used a "modded" approach, however, so the amount of work done by these students was both surprising and encouraging, even if the ethical learning goals are not yet fully being met in an ideal way. From this experience, we offered six guidelines for aspiring ethics game developers that we believe are helpful for designing games that are both enjoyable for players and useful for pedagogical purposes.

A well-designed and empirically tested ethics game will do much to help educate players about different ethical models, about the impact of their decision making on others, and about the advantages and disadvantages associated with different behaviors from different moral perspectives. More importantly, though, such games may encourage the formation of communities of individuals with a common shared experience of playing that game and understanding its content. In our mind, it is these communities of players who will ultimately lead to the most interesting types of learning in this

domain, particularly if these users are encouraged to interact with one another and if these interactions are observed and studied.

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