THE GLOBAL VILLAGE PLAYGROUND: A QUALITATIVE CASE STUDY OF DESIGNING AN ARG AS A CAPSTONE LEARNING EXPERIENCE

Mary Jo Dondlinger, B.A., M.A.

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APPROVED:

Scott J. Warren, Major Professor
Kathleen Whitson, Minor Professor
Cathleen Norris, Committee Member
Jeff Allen, Interim Chair of the Department of Learning Technologies
Herman L. Totten, Dean of the College of Information
Michael Monticino, Interim Dean of the Robert B. Toulouse School of Graduate

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The Global Village Playground (GVP) was a capstone learning experience designed to address institutional assessment needs while providing an integrated, contextualized, and authentic learning experience for students. In the GVP, students work on simulated and real-world problems as a design team tasked with developing an alternate reality game that makes an impact on the United Nations Millennium Development Goals. The purpose of this study was to evaluate the effectiveness of the design of the GVP as a capstone experience. The research design follows a qualitative case study approach to gather and analyze data collected from the instructors and students participating in the pilot implementation of the GVP. Results of the study show predominantly favorable reactions to various aspects of the course and its design. Students reported to have learned the most through interactions with peers and through applying and integrating knowledge in developing the alternate reality game that was the central problem scenario for the course. What students demonstrated to have learned included knowledge construction, social responsibility, open-mindedness, big picture thinking, and an understanding of their relationship to the larger society and world in which they live. Challenges that resulted from the design included the amount of necessary to build consensus and then develop an overarching game concept, the tension between guided and directed instruction, and the need to foster greater interdependence among students while encouraging them to become more self-directed.

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CHAPTER 1

INTRODUCTION

In the information age, the need to develop in learners the higher order thinking skills that translate into real-world problem-solving ability is more urgent than ever before (Secretary's Commission on Achieving Necessary Skills, 1991; The Safflund Institute, 2007). As early as 1991, the Secretary of Labor's Commission on Achieving Necessary Skills found that basic skills in reading, writing, and mathematics were the "irreducible minimum for anyone who wants to get even a low-skill job" but those skills were not a guarantee to either a career or access to higher education. Employer surveys continue to emphasize "thinking skills . . . [that] permit workers to analyze, synthesize, and evaluate complexity" are requisite to success in the global workplace (p. 14).

As global economic pressures mount, so does the need to produce a competitive and talented workforce. Additionally, the accountability movement in American education is driving educational institutions at all levels to examine what learning should occur at their institutions, devise means to measure that learning, and seek to continually improve the processes that have an impact on this learning (U.S. Department of Education, 2002). Data from a recent national survey initiated by the American Association of Colleges & Universities indicates that employers are dissatisfied

with assessment test-scores, grade-point-averages, institution ratings, and other numerically quantified scores of completer success. Instead, they call for "faculty-evaluated internships and community-learning experiences" as well as "essay tests, electronic portfolios of student work, and comprehensive senior projects" which provide means for students to develop "real-world skills" as well as demonstrable products of student performance in problem-solving and readiness for the workplace (Peter D. Hart Research Associates, 2008, p. 1). More specifically, the employers surveyed called for undergraduate learning experiences that foster the following:

- Engagement with big questions
- Critical and creative thinking about complex problems
- Active involvement in diverse communities and real world challenges
- Application of knowledge and skills in diverse settings and innovative ways (Peter D. Hart Research Associates, 2008)

In light of this report, the focus of instruction needs to become one that allows large-scale problem solving and compels a deliverable product that can then be evaluated by agencies outside of academia.

In his recent book, *A Whole New Mind*, Daniel H. Pink (2006) compellingly argues that competitive success in the conceptual age requires a new mindset, one infused with creative or artistic thinking.

> The past few decades have belonged to a certain kind of person with a certain kind of mind—computer programmers who could crank code, lawyers who could craft contracts, MBAs who could crunch numbers. But the keys to the kingdom are changing hands. The future belongs to a very different kind of person with a very different kind of mind—creators and

> empathizers, pattern recognizers, and meaning makers. These people—artists, inventors, designers, storytellers, caregivers, consolers, big picture thinkers—will now reap society's richest rewards. (Pink, 2006, p. 1)

While the sequential, detail- and text-oriented thinking vital to the occupations of the information age is still important, Pink asserts that simultaneous, big picture, context-oriented thinking is requisite to success in the conceptual age. Thus, creating a problem-solving experience wherein students engage in the process of *designing* is a potential means to foster this way of thinking.

However, as a recent National Science Foundation (NSF) sponsored report suggests, educational systems continually have to do more with less. Although employers are demanding these additional skills, learning institutions have to instill those skills without adding additional credit hours or courses to their programs (Safflund Institute, 2007). The means to achieving this end then is through changing instructional strategies in existing courses, and providing that vital added value through communications technologies, simulations, and other forms of digital media.

In community colleges, assessment of student learning outcomes takes place at the program level for career and technical programs and at the department or discipline level for an academic curriculum. However, enrollment at community colleges in general education curricula for the purpose of transfer to a four-year university has increased dramatically over the past decade and a half (Blom, 2001; Hoachlander, Sikora, & Horn, 2003; Sturtz, 2006). Along with these increases are parallel pressures to assess student learning in general

education programs at an institutional level rather than at the department or discipline levels at which it has been assessed in the past (Southern Association of Colleges and Schools, 2007). In career and technical programs, which are largely performance-based, measuring student attainment of learning outcomes is not as difficult as it can be in academic programs which are based on intellectual competencies: the distinction being between observable performance and unobservable thinking patterns. Moreover, career and technical programs usually culminate in a summative learning experience such as an internship, practicum, service learning project, or problem-based capstone course. Such program capstones provide not only a summative application of the knowledge and skills attained throughout a program, but also a venue through which to assess the effectiveness of the program. However, another difficulty in assessing student learning in academic transfer or general education curricula is that such programs neither require students to complete the curriculum in any particular order nor culminate in a capstone experience at the end. While courses in some disciplines are sequenced by prerequisites (e.g. English, math, and science), the curriculum as a whole is not sequenced, making it difficult to identify a course or set of courses that could be designated as capstones.

Statement of the Problem

The Texas Higher Education Coordinating Board (THECB) has designated core perspectives, the recommended learning goals of the core curriculum (Texas Higher Education Coordinating Board, 1999). The task at hand for a

large, urban, community college in the southwest is to find a means to measure it. To this end, the college assembled an Institutional Capstone Committee (ICC) with a five-year timeline for developing an institutionalized means of assessing attainment of the THECB core perspectives in students who complete the core curriculum at the college.

The ICC determined that an electronic portfolio to be evaluated by members of that committee would serve this purpose. The use of portfolios to assess student learning outcomes that result from engagement in courses as well as entire programs of study has become a popular approach (Barrett, 2007; Juniewicz, 2003). However, the proposed portfolio presents a number of challenges rather than solutions to the issue at hand: assessing attainment of core perspectives in order to improve instructional processes.

Assessment vs. Experience

The proposed portfolio is a capstone *assessment* rather than a capstone *experience*. It artificially layers an additional product on top of student coursework, rather than creating a capstone experience*,* integrating the learning from the multiple disciplines that comprise the core curriculum. The college could compel completion of the portfolio as a requirement for graduation; however, research has shown that for a portfolio assessment to be effective, the means by which it is implemented must provide scaffolding and feedback to learners throughout the portfolio creation process (Segers, Gijbels, & Thurlings, 2008; Van Tartwijk, Driessen, Van Der Vleuten, & Stokking, 2007). In other words, a

means to provide this scaffolding and feedback or to integrate the assessment into student experience must be developed as well.

Validity of Results

Moreover, if the portfolio is implemented solely as mandated requirement for graduation, it is not likely to yield the desired results. On the one hand, students not wishing to take on this additional academic task could instead complete the core curriculum at another institution where there is no such mandate, an option readily available in a large, multi-college district. On the other hand, students could opt not to complete the transfer core in its entirety, and simply complete as many courses as possible within the institutional mandate and then transfer directly to the university. Thus, those students who chose to complete the portfolio would not likely constitute a representative sample of core completers. Rather, they would represent a group that either is not aware that other options exist or that atypically rises to the challenge of additional work.

Core Perspectives and Quality Improvement

While the items to be included in the portfolio address some aspects of some of the THECB core perspectives, they do not fully address all of them. For example, samples of student writing from a given sociology course might demonstrate the second perspective, “stimulate a capacity to discuss and reflect upon individual, political, economic, and social aspects of life in order to understand ways in which to be a responsible member of society“ (Texas Higher

Education Coordinating Board, 1999), it does not necessarily do so. Moreover, the goal of such an assessment is to measure both the achievement of outcomes and to identify areas of weakness so that they can be improved. If better designed, the portfolio could help identify which perspectives students are not attaining well, but it does not illuminate what areas in the core curriculum need further improvement.

Solution

One approach to addressing these issues is to develop a problem-based, capstone experience that allows students to put knowledge gained across the core curriculum to work as they develop solutions to problems (Albanese & Mitchell, 1993). The Global Village Playground (GVP) was a capstone learning experience designed to address these institutional assessment needs while providing a more integrated, contextualized, and authentic learning experience for students than the creation of a portfolio alone. In the GVP, students work on simulated and real-world problems as a design team tasked with developing an alternate reality game (ARG, see definition in Definition of Terms) (Martin & Chatfield, 2006) that makes an impact on the United Nations Millennium Development Goals (United Nations, 2005). This design project was intended to simulate a real-world work scenario in which students collaborate to create a deliverable product that meets the specifications of a client agency. The scenario compels students to interact with authentic work problems, such as communicating effectively with members of small and large groups, managing a

project timeline, and solving problems collaboratively. It also requires students to engage with global issues and devise strategies that will address them, central goals of the core perspectives (Texas Higher Education Coordinating Board, 1999), as well as the conceptual age thinking described briefly above (Pink, 2006).

Purpose of the Study

The underlying premise of the GVP as an instructional design solution is that immersing community college students nearing completion of the general academic transfer program in a large-scale, collaborative design project as a capstone experience will have a perceived impact on their attainment of the THECB core perspectives (Texas Higher Education Coordinating Board, 1999). The purpose of this study was to evaluate the effectiveness of the design of the GVP as a capstone experience. The research design follows a qualitative case study approach to gather and analyze data collected from the instructors and students participating in the pilot implementation of the GVP. Although the GVP was designed to provide a means to evaluate the academic transfer studies program as a whole, this study focused specifically on evaluating the design of the GVP, the effectiveness of the problem-based instructional methods, and the tensions that arise from implementing them.

Research Questions

The effectiveness of many educational innovations is evaluated by student achievement of the learning outcomes targeted by the instructional design intervention. This study does not ignore that precedent or its urgency. However, it follows a design-based research approach, focusing first on evaluating the pilot implementation in order to improve the design prior to a more general evaluation of its impact on student achievement. More specifically, this study addresses the following research questions:

1. What are student and instructor reactions to the course/course design?
2. What aspects of the design were most conducive to student learning?
3. To what extent did the course promote attainment of the overarching program objectives (core perspectives) and/or advance conceptual age thinking?
4. What challenges or tensions arose from the design?

While this study is not intended as an evaluation of the entire academic transfer program, it should inform institutional stakeholders about the viability of this particular capstone as a means to that end.

Definition Of Terms

Alternate reality game (ARG): a relatively new genre of multi-player online games, the ARG distributes game challenges among a variety of online media, as opposed to game formats that make use of a single, stand alone game world. For example, game play might begin with examination

of a web site that directs players to a YouTube video, which in turn takes them to an online news article. Each of these sites requires the player to piece together parts of an overarching narrative puzzle that moves from place to the next. Because they make use of spaces created specifically for the game as well as “real” phenonmena (such as the news article mentioned above), ARGs blur the boundaries between reality and fiction, creating realities that are alternate to but not entirely separate from every life.

Augmented reality game: Similar to alternate reality games, augmented reality games distribute the game space among a variety of media. However, augmented reality games differ in that they include on-the-ground settings in the play space in addition to virtual sites.

Case study: A research design that investigates a single, bounded instance of a phenomenon in its entirety. Case study research designs typically include qualitative methods of data collection and analysis but may use mixed methods approaches, blending qualitative with quantitative measures.

Game: A game is an interactive system characterized by an artificial conflict or win scenario that is bounded by rules and a quantifiable outcome (Salen & Zimmerman, 2004). In order to attain a “win,” players must follow the rules as they overcome obstacles in pursuit of game goals.

Implementation: The enactment or execution of an instructional design for a specified period of time.

Problem-based learning (PBL): An instructional methodology within the social constructivist learning paradigm, the central component of problem-based learning is an authentic, ill-structured problem which is posed to groups of learners who develop a socially negotiated problem solution. In PBL environments, the instructor's role is to facilitate the problem-solving process, guide learners to resources, and enable knowledge construction by posing cognitively-challenging questions rather than providing definitive answers.

Limitations of This Study

This study does pose limitations to conclusions that may be drawn from it and applied to the body of knowledge regarding teaching and learning. First, the author and researcher for this study was also the primary designer of the instructional design solution, the Global Village Playground, as well as one of the two instructors who taught the course. These multiple roles provide additional insight into the research questions, but they also compromise claims to objective distance from the case under study.

The number of participants in the study also limits the assertions that can be made from it. Although eight students enrolled in the course, only six completed the class. Two students withdrew around the fourth week of the semester. Moreover, the course was designed as a capstone for the academic transfer program at the college of implementation. However, three of six participants were technical program students in the Interactive Simulation and

Game Design program (ISGT). Consequently, those participants had not been exposed to the full range of general education courses that other participants had experienced.

Additionally, this study does not intend to “control for” prior knowledge and skills attained throughout the array of general education courses, in order to make claims about what learning occurred in this course. The nature of a capstone course requires that learners integrate and build upon prior knowledge. At best, conclusions can be drawn about what learning goals the institution might need to place more instructional emphasis on in all courses; however, the methods of data collection and analysis for this research design to not lend themselves to such conclusions.

Finally, because this research design does not compare the GVP with other capstone course designs, the results cannot support claims that this specific design scenario is the best or the only means to engage students in a meaningful capstone experience. Conclusions will be limited to assertions regarding the relative success or failure of problem or project based methods as the foundation for meaningful capstone experiences.

Overview of the Dissertation

The next chapter reviews the relevant literature on designing games for learning. An understanding of what makes an effective educational game is imperative to understanding the knowledge and skills required and acquired in the process of designing one. The review also explores the learning theories

supporting the use of games for instruction and the learning outcomes that have been attributed to digital learning games. Finally, it examines an emerging digital game genre, the alternate reality game (ARG), and the relatively nascent research on learning by designing digital games.

The third chapter provides a description of the GVP capstone design, beginning with the front-end analysis of the learning outcomes, the alignment of those outcomes with the problem scenario, and the selection of course content based on this specific problem scenario. The chapter also details the collaborative process employed in developing course materials and the resulting course design, which differed somewhat from the original intentions of the primary instructional designer.

The fourth chapter explains the research methods used to evaluate the design, including the primary means of data collection and analysis as well as their appropriateness for this study. The fifth chapter presents the results of the study, aligning assertions grounded in the data with the research questions that framed this evaluation. The final chapter explores the implications of the results and discusses directions for future research.

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of the Global Village Playground (GVP) design was to immerse community college students who are nearing completion of the academic core curriculum in a large-scale, collaborative design project as a capstone experience, which situates them in the role of game designers, developing an alternate reality game (ARG) that makes an impact on the United Nations Millennium Development Goals (UN MDGs), the "big questions" with which this design engages learners. The use of games to promote learning is not a new instructional strategy (Aguilera & Mendiz, 2003); however, the surge of interest in digital games and simulations for learning recently stems in part from their ability to captivate players to voluntarily engage in game play for hours on end. Coupled with this high level of engagement, digital learning games are also thought to situate learning in contexts that better reflect the real world and to immerse players in challenging learning experiences. But what characteristics make a digital game engaging? What can players learn from digital games? What learning theories support the use of games for learning? And finally, can learners acquire similar or additional knowledge, skills, and abilities by designing digital games that they do from playing them? In order to address the research

questions for this study, these questions and the research literature that offers answers to them first need to be explored.

Characteristics of Effective Digital Games

Much research has examined the motivating quality of video games; however, not all researchers entirely agree on the source of this motivation. Some attribute the compelling nature of games to their narrative context (Dickey, 2005; Fisch, 2005; Waraich, 2004), others find that motivation is linked to goals and rewards within the game itself or intrinsic to the act of playing (Amory, Naicker, Vincent, & Adams, 1999; Denis & Jouvelot, 2005; Dickey, 2006; Jennings, 2001). Nevertheless, all find that motivation to play is a significant characteristic of educational video games and that effective game design considers both intrinsic and extrinsic rewards for play. Denis and Jouvelot (2005) distinguish between the two and their absence as follows:

> Intrinsic motivation pushes us to act freely, on our own, for the sake of it; extrinsic motivation pulls us to act due to factors that are external to the activity itself, like reward or threat; amotivation denotes the absence of motivation. (p. 462)

These authors see motivation as the interplay between desire and pleasure—the desire to be competent and the pleasure one feels when one is. They argue that competence, autonomy, and relatedness are factors that affect motivation. "Motivation also leads to the activation of efficient cognitive strategies for long-

term memory issues like monitoring, elaborating or organizing information. On the opposite side, resignation and amotivation have negative results on memorization and personal development" (p. 463).

Amory, Naicker, Vincent, & Adams (1999) examined four different game types and analyzed elements that players liked most. In this study, students rated a number of game qualities including the "the fun aspect, sounds and graphics, type of game, game story and use of technology"; "the importance of some skills [logic, memory, visualisation, and mathematics, reflexes, and problem solving]"; "whether the game was easy to play, addictive, too long, challenging, confusing, too difficult, illogical, difficult to play or manoeuvre and if their performance increased with continuous play" (p. 314). Adventure and strategy games were found to be the most stimulating and rated the highest, a finding which suggests that players preferred or were more motivated to play games with objectives that require higher order thinking skills, including visualization strategies that nurture creative problem solving and decision-making. (p. 317).

On a similar note, Dickey (2006) argues that a narrative context that promotes "challenge, fantasy, and curiosity" and that provides feedback for players is one that promotes intrinsic motivation for play (p. 2). She also finds that "Strategies of design that lead to engagement may include role-playing, narrative arcs, challenges, and interactive choices within the game as well as interaction with other players" (p. 1). In another study, Waraich (2004) agrees

that narrative is essential to motivation but cautions that “intrinsic rewards are based on a high congruence between the material being taught and the motivational techniques used” (p. 98). Dissonance between the two can decrease learning.

Narrative Context

Disagreement on the source of motivation aside, a general consensus that narrative context is an important element of effective digital game design does exist. Several studies support this finding and deal most prominently with narrative as a significant design element. In two studies on game-like environments for learning, Michele Dickey (2006) finds that 3-D learning environments not only provide a narrative context for situating and contextualizing learning, they also enable an understanding of spatial relationships rather than linear ones. In an article on the design of Murder on Grimm Isle, a game created to cultivate argumentative writing skills, Dickey (2006) concludes that spatial and narrative contexts offer learners “a cognitive framework for problem-solving because the narrative storyline in games provides an environment in which players can identify and construct causal patterns which integrates what is known (backstory, environment, rules, etc.) with that which is conjectural yet plausible within the context of the story“ (p. 2). She presents similar findings in case studies of two 3-D environments for courses in business computing and 3-D modeling, arguing that contextual elements such as a first person symbolic perspective and 3-dimensional representations of space

increase learners' sense of presence and consequently their interaction and collaboration. "This [narrative] context builds on learners' real-world knowledge by providing a visual metaphor, or perhaps more aptly stated, a visual narrative of the course content" (Dickey, 2005, p. 444).

In a study of a variety of design elements on game environments for instruction in computer science architecture, Waraich (2004) focuses mainly on narrative. This empirical study analyzed the role of both narrative context and game goals as features for motivating and conceptualizing learning in a 2-D ILE (interactive learning environment). The mixed methods design of the study revealed quantifiable knowledge gains in the ILE over traditional instruction. Waraich concludes that "For any learning task to be meaningful to the learner they must have both a sufficient context for the learning and motivation to perform the tasks that will help them to learn. We believe that game based learning environments that incorporate a strong narrative can meet these requirements if the learning tasks are appropriately designed and tightly coupled with the narrative" (p. 98).

In what is largely a theoretical discussion rather than a research study, Fisch (2005) makes a similar observation. Although narrative context does motivate learning, for an educational game to be effective, the learning content must align with the narrative plotline. According to Fisch's analysis, "research on lectures and textbook readings has suggested that seductive details do not work; children exposed to such material tend to remember the appealing elements but

not the intended educational content" (p. 57). He finds that a "far more powerful approach is to place the educational content at the heart of engaging game play, so that children employ the targeted academic skills and knowledge as an integral part of playing the game" (p.58). Fisch also maintains that selecting appropriate media as well as providing feedback and scaffolding within and outside of the game are essential to effective educational game design.

Goals and Rules

Another significant element of effective video game design is a system of objectives, goals, and rules of play (Salen & Zimmerman, 2004; Waraich, 2004; Zagal, Nussbaum, & Rosas, 2000). Although they are integrated within a narrative context, goals and rules are not subordinate to context; they are equally important elements of it. In an overview of initiatives in educational games, Jenkins, Klopfer, Squire, and Tan (2003) describe the design and testing of three video game prototypes: Supercharged!, a game on electromagnetism; Environmental Detectives, an environmental science game; and Revolution, a game for American history. Each has a narrative structure that students follow to determine their objectives or goals. Playing the role of a charged particle in Supercharged!, a scientist in Environmental Detectives, and a soldier, revolutionary, or townsperson in Revolution, each game has distinct objectives and a variety of rules frame the play. For example, the laws of electromagnetism provide the rules in Supercharged! Players must master the rules of the game to accomplish their objectives.

Swartout and van Lent (2003) further elaborate on goals in effective video games, finding that goals of different levels help motivate learners to continue play. “Game designers often seek to keep players engaged by creating three levels of goals: short-term (collect the magic keys), lasting, perhaps, seconds; medium-term (open the enchanted safe), lasting minutes; and finally, long-term (save the world), lasting the length of the game” and that the “interplay of these levels, with the support of the environment, is crafted to draw players into the storyline of the game” (p.34). This design concept is similar to Gee’s (2003) achievement principle which states that “for learners of all levels of skill there are instrinsic rewards from the beginning, customized to each learner’s level, effort, and growing mastery and signaling the learner’s ongoing achievement” (p. 67).

Interactivity and Multisensory Cues

Interaction between the player (or players) and the game environment is another game element embedded in the narrative context and game objectives. Effective games weave objects and characters into a game environment that provide feedback and hint structures for successful game play (Fisch, 2005). Moreover, the degree of user control over the game environment further constitutes the level of interactivity. Swartout and van Lent (2003) deem that the best games are “highly interactive, deliberately generating tension between the degree of control the story imposes and the player’s freedom of interaction” (p. 34), reasoning that in games with complete freedom of interaction, the playing experience can be boring and unchallenging. On the other hand, when the

plotline imposes too much control, the player becomes a passive observer rather than an active participant. Providing a balance to these extremes by "cleverly exploiting the narrative to shape the players' experience," effective game design gives players "the perception they have free will, even though at any time their options are actually quite limited" (p. 34). James Paul Gee (2003) calls this concept the regime of competence principle which states that the player/learner "gets ample opportunity to operate within, but at the outer edge of, his or her resources, so that at those points things are felt as challenging but not 'undoable'" (p. 71).

In an overview of the design process and the various elements of multiplayer games, including rules and goals, props and tools, Zagal, Nussbaum, and Rosas (2000) also examine the role of interactivity as a critical element in effective games, proposing that game designers should consider the extent to which the game rules, props, and tools affect stimulated and natural social interaction. "Stimulated (or forced) social interaction occurs when the rules of a game encourage the players to interact socially" while "natural social interaction occurs when the players spontaneously decide to interact. The game rules do not enforce this type of activity; it just happens" (p. 451). Such interactions might depend on cooperation, competition, or a combination of both. They might also require synchronicity or coordination, types of interactions, which are determined by player composition in the game. The article also includes a model for analyzing player composition and social interaction in game design.

A study by Salzman, Loftin, Dede, and McGlynn (1996) further confirms that multisensory cues are a significant component of successful game-like environments. These researchers conclude that "multisensory cues can engage learners, direct their attention to important behaviors and relationships, help them understand new sensory perspectives, prevent errors through feedback cues, and enhance ease of use" (p. 2). While learning outcomes afforded by gaming media will be discussed in greater depth later in this review, another significant finding in this study is that multisensory interactions "can help learners understand complex phenomena," particularly for students with "severely limited or inaccurate mental models of science concepts" (p. 2).

Learning Outcomes Attributed To Educational Games

21st Century Skills

In a historical review of the research on video game design, Aguilera and Mendiz (2003) maintain that "arguments in favor of the cognitive importance of video games are based on a number of studies indicating that many video games are conducive to the development of specific skills: attention, spatial concentration, problem-solving, decision-making, collaborative work, creativity, and, of course, ICT skills" (p. 8). Many of these skills are earmarked as those necessary to successfully participate in the global, knowledge based economy of the 21st century. Employing rather cursory case studies of specific games and anecdotal comments from young video game players as evidence of his

assertions, Marc Prensky (2006) contrasts the nature of digital immigrants (those who have recently migrated to the use of digital technology) to that of digital natives (those who have grown up with it). Although Prensky is not an educational researcher, he is a widely acclaimed speaker and writer on how complex video games teach digital natives in ways not offered by traditional instruction. The most significant of his ideas are his description of complex videos games and the 21st century skills that game play can impart.

Schrier (2006) designed an augmented reality game (see definition in Chapter 1) designed specifically to foster 21st century skills, including "interpretation, multimodal thinking, problem solving, information management, teamwork, flexibility, civic engagement, and the acceptance of diverse perspectives." The research design employed a mixed-methods approach which included pre- and post attitudinal surveys, interviews, and video taped learning sessions and yielded results which suggest that problem-based learning augmented with game-like design features can indeed encourage the development of these skills. Since the Schrier's research did not employ an experimental design comparing the augmented reality treatment to a control group, generalizations about learning gains in such the game-like environment over a traditional classroom were not supported by this study.

Deduction and Hypothesis Testing

The results of a variety of studies suggest that video games and game-like environments are conducive to deductive reasoning and hypothesis testing (Aguilera & Mendiz, 2003; Gee, 2003; Jenkins et al., 2003; Klopfer & Yoon, 2005; Lunce, 2006; Salzman, Dede, & Loftin, 1999). In a qualitative analysis of both what and how students learned playing Civilization III in a interdisciplinary history, humanities, and social studies course Barab and Squire (2004) found that game play promoted deep learning, hypothesis testing, strategizing, and appropriating content (history) as a tool for play. Squire, Barnett, Grant and Higginbotham (2004) established that students in an experimental group who played the simulation-game, Supercharged!, better mastered the abstract and conceptual knowledge related to electromagnetism than those in the control group who learned through guided discovery-based science methods. The researchers attribute these learning gains to replay for testing new hypotheses afforded by the simulation game.

Complex Concepts and Abstract Thinking

Other studies build on the findings of Squire, Barnett, Grant, and Higginbotham concerning mastery of abstract and conceptual knowledge through game play (Aguilera & Mendiz, 2003; Gee, 2003; Lunce, 2006; Prensky, 2006). Writing about technology in general rather than games specifically, Kelly (2005) argues that technology applications including video games promote mastery of complex concepts. In a qualitative case study of the game-like computer-

modeling environment, StarLogo, Klopfer and Yoon (2005) discovered that students who “struggle with understanding the dynamics of complex systems” were able to better comprehend these systems after working with StarLogo.

Visual and Spatial Processing

Because most complex video games are situated in 2- or 3-dimensional environments, it is no surprise that research has found increased spatial development in video game players. According to Aguilera and Mendiz (2003), “adolescents with medium- or long-term experience playing video games show greater visual capacity, motor activity, and spatial abilities-reflexes and responses” (p. 6). Using game engines to render and then explore the effects of architectural designs, Burrow and More (2005) observed that the capabilities of game-engines “allow participants to experience the spatial design in ways that are not predetermined by the designer” (p. 35). The objective of their project was to explore the relationship between architectural design elements and atmosphere, analyzing both the atmosphere produced by the architectural design and the impact of atmosphere on the design. Burrow and More argue that this focus “emphasizes critical thinking on the nature of space and its representation, from the visual and sonic through lighting, textures, and sound, to the nature of the movement through space, and its interactivity” (p. 38).

Learning Theories Supporting Digital Games for Instruction

Situated Cognition

In a symposium on learning theories for the analysis of educational video games, Halverson, Shaffer, Squire, and Steinkuehler (2006) assert that situated cognition provides a meaningful framework for the study of games, given their ability to situate learning in an authentic context and engage players in a community of practice. According to these and other scholars, the authentic, situated context affords greater content mastery and transfer of learning to real world settings than traditional classroom learning (Aldrich, 2003; Dickey, 2005, 2006; Heinich, Molenda, Russell, & Smaldino, 1999; Klopfer & Yoon, 2005; Pearce, 1997; Schrier, 2006). According to Lave and Wenger (1991) and Bransford et al (2003), situating learning in relevant environmental contexts provides learners with cognitive scaffolds that are expected to increase levels of learning, engagement, and transfer to future work. Methods that anchor instruction to meaningful and authentic contexts have been found to better allow learners to understand and transfer complex concepts than instructional methods which neglect to convey how, when, and where a concept can be applied in future situations that the learner might encounter (Cognition and Technology Group at Vanderbilt, 1990, 1993). Such methods are also thought to immerse learners in a community of practice, wherein they perform the roles of a practitioner rather than a learner—functioning, for example, as a scientist rather than a student in order to solve scientific problems, as opposed to the often

decontextualized student challenges of completing an assignment or passing a test (Brush & Saye, 2001). Indeed, technological advances in computer-generated media have allowed the creation of immersive virtual environments that graphically represent reality more closely than ever and to pre-program these environments for almost instantaneous feedback based on parameters observed in reality. This learning affordance (Gibson, 1977) allows users to manipulate variables, adjust their actions or behaviors, and experiment with various processes or procedures.

Constructivism

Several researchers find that learning with well-designed video games adheres to constructivist principles (Dede, Nelson, Ketelhut, Clarke, & Bowman, 2004; Dickey, 2005, 2006; Gee, 2003; Schrier, 2006). In an article describing the multi-user virtual world, SciCtr, Margaret Corbit (2005) underscores the merits of a constructivist approach for analyzing game-like environments. In SciCtr, students create virtual science worlds, such as a rainforest or a desert, that other learners can visit and explore. According to Corbit, these worlds, the paths to navigate through them, and content embedded in them are constructed by the developer/learner through meticulous research and thoughtful design. Dede, Nelson, Ketelhut, Clarke, and Bowman (2004) outline both constructivist and situated learning design principles present in effective video games including GST (guided social constructivist design), EMC (expert modeling and coaching) and LPP (legitimate peripheral participation). These authors employ such

principles in evaluating game design and apply their findings to future iterations of the design.

Problem-Based Learning

A subset of constructivist learning theory, problem-based learning (PBL) approaches can also provide a useful framework for understanding the value of games for learning. The central feature of PBL environments is an authentic, ill-structured problem, which is posed to groups of learners who develop a socially negotiated problem solution. This approach framed the designs and research related to River City and Taiga, learning game designs for science inquiry, both of which document learning gains over other more traditional approaches to instruction (Barab & Squire, 2004; Nelson, Ketelhut, Clarke, Bowman, & Dede, 2005). The PBL approach was also applied in Murder on Grimm Isle and Anytown, game-like environments designed to further writing practice (Dickey, 2006; Warren, Stein, Dondlinger, & Barab, 2009). As cited earlier, Dickey (2006) finds that the "narrative in games provides a cognitive framework for problem-solving" (p. 2). According to Warren (2006), the narrative in combination with additional scaffolding from non-player characters serving as pedagogical agents facilitate the problem-solving process and guide learners' knowledge construction. PBL was the underlying learning theory that drove the design of The Door, an alternate reality game (ARG) for a post-secondary computer applications course (Warren & Dondlinger, 2008a). While the research on this design is discussed in more detail later, what is unique about The Door,

compared to other learning game designs reviewed here, is the application of PBL and game elements for learning at the post-secondary level. The majority of the literature on games for learning studies their impact in K-12 settings.

Constructionism

Designing and developing video games, rather than playing them, applies a contructionist approach to learning with games (Robertson & Good, 2005; Robertson et al., 2004). El-Nasr and Smith (2006) view game modding—the development of new modules in an existing game using toolkits packaged with the game—as a constructivist method of learning. The constructionist approach to learning involves two activities: "the mental construction of knowledge that occurs with world experiences" and the creation of "products that are personally meaningful" (p. 2). The theory proposes that whatever the product, a birdhouse, computer program, or robot, the "design and implementation of products are meaningful to those creating them and that learning becomes active and self-directed through the construction of artifacts" (p. 2). Steiner, Kaplan, & Moulthrop (2006) concur with this view and contend that when "working to develop designs, test technology, and suggest revisions, children as design partners improve the technologies they consume as well as gain educational benefits from the experience" (p. 137). Burrow and More (2005) apply constructionist techniques in an architecture course by having students render their designs with a game-engine thereby exploring spatial relationships as well

as atmosphere, lighting, and other environmental conditions in a 3-dimensional simulation of their architectural designs.

Alternate Reality Games

While the research literature indicates promising results in terms of the educational merit of designing a digital game, developing the fully integrated, stand-alone simulation or game worlds typical of contemporary video games is costly and time consuming. Moreover, it requires a great deal of technical proficiency with game-engines, modeling tools, and other high-end computer software. However, a fairly new genre of game, the alternate reality game or ARG, distributes game challenges, tasks, and rewards across a variety of media, both digital and real. Harnessing media with intuitive usability, such as MySpace, web logs, podcasts, and YouTube, an ARG leverages tools that digital age learners use as part of their daily lives. Thus, development of the game design requires little technical proficiency and imposes minimal expense to financially strapped students, instructors, and educational institutions at any level.

What is an ARG? As described by the International Game Developers Association (Martin & Chatfield, 2006), “Alternate Reality Games take the substance of everyday life and weave it into narratives that layer additional meaning, depth, and interaction upon the real world” (p. 6). CNET staff writer, John Borland (2005), depicts them as “an obsession-inspiring genre that blends real-life treasure hunting, interactive storytelling, video games and online community” (para. 4). Thus, an ARG provides players with an immersive digital

experience that arguably better simulates the reality of information distribution (Baudrillard, 1994) than closed system games modeled on discrete parameters for the purpose of focused instructional goals. This is not to say that such media are unworthy as instructional products, but merely to point out that ARGs simulate information distribution and the skills necessary to seek, locate and evaluate that information in a highly meaningful way. Controlled by the narrative storyline, players are given new clues and directed to increasingly complex puzzles as the game progresses. Moreover, these games compel players to seek resources in a variety of places, evaluate the relevance of those resources, and apply them to solving the task at hand. Such skills are invaluable in a knowledge-based and information-saturated workplace, which requires not only the ability to find information, but also to evaluate its validity, authority, and applicability (Peter D. Hart Research Associates, 2008).

Although the ARG as a game genre has emerged quite recently, Web sites such as unfiction.com and ARGNet have links to several past and current ARGs, such as Cathy's Book and iamtryingtobelieve.com. Some ARGs have served a marketing function, such as ilovebees.com that supported the release of Microsoft's Halo 2 video game. Others have an educational focus; Hexagon Challenge and Never Rest Game are billed as instructional ARGs and claim to "address decision-making skills, after-action report generation, and adaptation to performance" (Bogost, 2007). Yet others, while not explicitly educational, deal with social, economic, or environmental justice and aim "to change the way

people think, and feel, and live" (Strickland, 2007). Jane McGonigal, who masterminds ARGs for their capacity to construct "collective intelligence," maintains that the purpose of her 2007 ARG, World Without Oil, was to "play our way to a set of ideas about how to manage that crisis [a dramatic decrease in oil availability]" (cited in Strickland, 2007, p. 1). McGonigal observed that players not only generated strategies for coping with a peak oil crisis, they also changed their real world behavior: planting trees or converting their cars to run on biodiesel (Strickland, 2007). Thus, the simulated problem presented through the ARG yielded practical solutions and prompted real world applications of the knowledge constructed in the simulated play space.

Furthermore, recent research on the use of The Door ARG to transform a large enrollment class at a university in Texas met with favorable results including statistically significant gains on posttest achievement when compared with existing computer aided instruction ($t(63)=3.898$, $p=.0001$) (Warren & Dondlinger, 2008c). Perhaps more significant, however, was the sense of power that students reported to have gained from their experience with The Door ARG (Warren, Dondlinger, & McLeod, 2008). Although they reported a great deal of frustration with this learner-directed instructional design, they also marveled at how much they learned, particularly the resourcefulness to seek out answers and solutions to problems since neither were served up to them via the closed-system learning management system (LMS) to which they were accustomed or

from the instructor who consistently redirected them to their peers and to other resources for answers to their questions (Warren, Dondlinger et al., 2008).

Learning By Designing Digital Games

Despite its success in terms of empowering learners to be full participants in their learning experiences, The Door ARG as a course redesign project was created by instructional design faculty and revised based on student feedback. Indeed, the most common approach to creating educational games is to *design for* learners to play by including imposed instructional goals that result from professional analysis (Dondlinger, 2007). The *design for* approach has been employed by many designers of instructional game spaces (Hays, 2005; Squire, 2006; Warren & Dondlinger, 2008b). However, some learning game designers have progressed to a second stage wherein the learners become co-participants through regular feedback to the designers, an approach in which the space and activities are *designed with* the learners as revision to the product takes place (Barab, Warren, & Ingram-Goble, 2008). Designers of The Door implemented this strategy. While more responsive to learners needs than the designed for approach, it does not center the learner as the core designer of the learning and play activities in the simulated space. For example, The Door attempted to be responsive to learner feedback through the iterative nature of the design based research process (Barab & Squire, 2004) by incorporating the daily, formative, and summative feedback that the researchers collected each semester over two

years into revisions of the game. While useful for improving the experience over time, this was not efficient for developing the simulation game curriculum. Further, it did not employ the students as designers of the experience. Based on the qualitative data from the study, designers and students perceived that this disenfranchised them from what the designers now view as a necessary participatory role in the design and development process and that would have provided them with important buy-in (Warren, Dondlinger, & Whitworth, 2007).

However, another approach exists. This approach has students themselves design and employ technological tools as a means of engaging others in the problem-solving process in which the problem is the development of the game itself, a method supported by the research of Kolodner (2002) with the Learning by Design approach to problem-based learning; it also supports Squire et al's (2005) proposal that instructional designers should move learners from the role of user to that of designer of the learning experience itself. However, since developing the 3-D worlds typical of many simulations and games is costly, time-consuming, and technically complicated, a much more viable alternative is to engage students in the production of an alternate reality game.

While the research on learners designing games as part of their learning program has yet to be instituted widely, a few studies have indicated that the *process* of designing games or simulations can encourage higher order thinking (McLester, 2005; Robertson & Good, 2005; Robertson et al., 2004; Steiner et al., 2006). According to El-Nasr & Smith (2006), "during the design process, skills

such as analysis, synthesis, evaluation, and revision must be used, providing opportunities for learning content and metacognitive skills such as planning and monitoring" (p. 2). Such a strategy combines elements of both constructionist and constructivist approaches, as well as problem-based and situated learning models. Further, the literature from a design based learning and research approach to the development of other forms of learning environments ranging from the use of multi-user virtual environments (MUVE) has shown promise for objective achievement in the areas of science education (Barab et al., 2007; Dede, Ketelhut, & Ruess, 2006; Liu, 2003), writing practice (Warren, Barab, & Dondlinger, 2008), and blended forms of instruction that leverage simulation games to target general computer skill literacy (Warren & Dondlinger, 2008a).

Summary

The proposed instructional design solution, The Global Village Playground (GVP), intends to examine how a game *designed by students* can be accomplished. This project engages sophomore students at a large, urban community college in an institutional capstone experience through which learners design and develop an ARG based on the theme of global sustainability and centered on the United Nations Millennium Development Goals (United Nations, 2005). Facilitated by a team of faculty, administrators, and community leaders, students work together to create a coherent game narrative, research content, organize activities, and develop the distributed game "world."

CHAPTER 3

DESIGN METHODOLOGY

Introduction

Games and simulations require specific design processes that take advantage of the technological systems (e.g., the Unreal 3 game engine) and the learning principles to be imparted through play (i.e. attention, perception, and memory in the simulated context). The design of the Global Village Playground (GVP) as a course centered on the process of designing a game followed a similar process. In this case, the course design process was driven by consideration of the activities involved in the process of designing a game, which includes a phase of analysis or planning, followed by a design phase, and then development of the game itself. While articulated here as a linear process, like most creative processes each phase is much more circular or iterative in nature than a written account of the process can express. In general, the process began with an analysis of the learning objectives to be accomplished by the design, followed by the design of the course itself, and finally development of the course activities and means of assessing student attainment of the course objectives (Heinich et al., 1999). However, in the process of developing instructional activities, the shape of the overall instructional design concept changed rather substantially, which then reshaped the instructional activities in development.

Each in turn were adapted and refined during the implementation of the course, further blurring the distinctions among the various phases of the process: analysis, design, development, and implementation. Thus, while each phase was neither finite nor discrete, they are necessarily presented here in a sequential fashion that belies their overlapping and mutually inclusive nature. The remainder of this chapter details the elements of this design concept, including the learning objectives, underlying design theory, alignment of objectives with academic content, development of the instructional activities, and means of assessment.

Learning Communities

As with many instructional design frameworks, this began with an analysis of the needs of the students, who would be served by the design and development of the learning product. Although the primary impetus for creating this capstone course emerged from the need to provide evidence to the state that completers of the academic core curriculum attained the state-recommended core perspectives, integrating those learning goals into a meaningful experience for students through which they could earn course credit, a mandated assessment product (a final portfolio) added on top of their coursework, was a learner-centered imperative to the designer. However, since the general education courses that comprise the academic transfer program are not sequenced, students in their final semester might have any combination of the required courses remaining to complete. Consequently, the capstone course could not summarily replace any single core course requirement; it needed to

provide participating students the option to obtain credit for a variety of core courses.

Like many community colleges, this institution already had an existing integrated learning initiative, or learning community program, that could provide the means to offer a capstone experience rather than a mere capstone assessment. The term, *learning community*, refers to a variety of different conceptions in different contexts. However, a Learning Community in community colleges typically refers to a team-taught course that combines two or more courses from different disciplines into one, integrated and themed learning experience. For example, the learning community, Romantic Music and Literature, combines music theory and English so that students "explore connections between the Romantic revolutionary movement in the works of several British poets and in that of selected musical composers," while students in Bye, Bye, Miss American Pie "study the political, social, and literary impact of popular songs from Bill Haley to Kanye West" to receive credit for English and government (Richland College, 2009b).

Learning communities benefit students in a number of ways. First, they make the connections between two or more disparate disciplines more transparent for students. Rather than struggling to make those connections themselves individually, students in a learning community explore and construct those connections together. Secondly, instead of managing course materials, assignments, and deadlines for separate courses, students get an "all-inclusive

package" of sorts. Most significantly, students are better able to develop a community of learners in such a course. Instead of spending three hours a week in one course with the students enrolled in it and another three hours a week with a different group of students in another course, students spend six hours a week with the same group, more deeply exploring the content of both courses and the connections between them.

Learning community courses have been found to have a positive impact on student retention and success, particularly for entering students. Initiatives at Cuyahoga Community College and Valencia Community College linking developmental studies with college level courses in learning communities have documented increases in success and retention (Lincoln, 2009). A study tracking student progress at thirteen community colleges found that low-income, academically unprepared freshmen who were placed in learning communities were "significantly more likely to persist to sophomore year" than those who were not (McHugh Engstrom & Tinto, 2008). While this research has focused on the impact of learning communities for entering students, this integrated approach can also provide a means to create a capstone experience in which student efforts are focused on a large-scale project aimed at promoting the higher-order outcomes identified as necessary to students' future success:

- Engagement with big questions
- Critical and creative thinking about complex problems
- Active involvement in diverse communities and real world challenges
- Application of knowledge and skills in diverse settings and innovative ways (Peter D. Hart Research Associates, 2008).

The student project along with other individual products, such as portfolios, could also be used to assess attainment of the broader program or institutional learning outcomes.

Identification of the Learning Objectives

Conceptual Age Thinking

In addition to the knowledge and skills identified in the AAC&U (American Association of Colleges and Universities) report cited above, the central problem scenario, designing an ARG, was informed by Pink's (2006) call for "a whole new mind," ways of thinking valued in what he designates the conceptual age. Pink distinguishes the conceptual age from the information age, identifying the principal occupations and characteristic thinking patterns of each. The information age was dominated by "computer programmers who could crank code, lawyers who could craft contracts, MBAs who could crunch numbers" (Pink, 2006, p. 1). These occupations require left-brained, sequential patterns of thinking, specializing in text and attention to details. Those who were more right-brained and simultaneous, who specialize in context and see the big picture, weren't as necessary in the information age job market. However, Pink argues that the conceptual age will belong to "creators and empathizers, pattern recognizers, and meaning makers . . . artists, inventors, designers, storytellers, caregivers, consolers, big picture thinkers" (Pink, 2006, p. 1). Left-brained thinkers will still be needed, but in a global marketplace, those who can *add value* to an enterprise will be those with a flair for design or the personal touch

that sets an organization's products or services apart from others. As Pink puts it, "mere survival today depends on being able to do something that overseas knowledge workers can't do cheaper, that powerful computers can't do faster, and that satisfies one of the nonmaterial, transcendent desires of an abundant age" (p. 51).

Pink designates these qualities as high concept and high touch. High concept involves "the ability to create artistic and emotional beauty, to detect patterns and opportunities, to craft a satisfying narrative, and to combine seemingly unrelated ideas into a novel invention" (p. 52). It's no longer enough to offer something that's merely functional and reasonably priced. What sets a product or service apart is a unique design or even a story behind the product or service being offered--in short, a *concept* rather than thing itself. High touch involves "the ability to empathize, to understand the subtleties of human interaction, to find joy in one's self and to elicit it in others, and to stretch beyond the quotidian, in pursuit of purpose and meaning" (p. 52). The attention to customer satisfaction that rules the marketplace today is evidence of this quality. Those that can identify and cater to human needs, sometimes a niche need, are those that are most competitive.

Thus, while problem-based learning has shown great promise as an instructional methodology for fostering higher-order critical thinking skills (Albanese & Mitchell, 1993), the goals of the GVP were not problem-solving alone. In order to engage learners in conceptual age patterns of thinking, the

central problem scenario was a *design problem*: designing and developing an ARG. Immersing students in such a design problem was expected to engage them in both critical and conceptual age thinking.

Institutional Goals

In the case of the Global Village Playground (GVP), a primary impetus for creating this capstone course emerged from the need to provide evidence to the state that completers of the academic core curriculum also attained the state-recommended core perspectives (Texas Higher Education Coordinating Board, 1999). These core perspectives consequently became the learning objectives targeted by the design:

1. Establish broad and multiple perspectives on the individual in relationship to the larger society and world in which he or she lives, and to understand the responsibilities of living in a culturally and ethnically diversified world;
2. Stimulate a capacity to discuss and reflect upon individual, political, economic, and social aspects of life in order to understand ways in which to be a responsible member of society;
3. Recognize the importance of maintaining health and wellness;
4. Develop a capacity to use knowledge of how technology and science affect their lives;
5. Develop personal values for ethical behavior;
6. Develop the ability to make aesthetic judgments;
7. Use logical reasoning in problem solving; and
8. Integrate knowledge and understand the interrelationships of the scholarly disciplines.

These perspectives are not the narrowly focused, cognitive outcomes typically measured by objective and/or standardized tests. Additionally, they include the affective values and attitudes vital to developing a global citizenry, perspectives sought by business and industry in an increasingly global marketplace. One of the core competencies identified by business leaders in the previously cited AAC&U sponsored study was “global knowledge;” this competency was immediately followed by skills in self-direction and in writing (Hart Research Associates, 2008). The GVP project contextualizes these competencies as the central activities of the design process to affect measurable performance of these vital skills.

Efforts at the college to address the need to assess these intellectual competencies in the past had yielded proposed “capstone” assessments, such as an electronic portfolio of student work. The use of portfolios to assess student learning outcomes that result from engagement in courses as well as entire programs of study has become a popular approach (Barrett, 2007; Juniewicz, 2003; Pullman, 2002). However, in this case, the approach provided only an assessment, artificially layering an additional product on top of student coursework, rather than creating a capstone experience*,* integrating the learning from the multiple disciplines that comprise the core curriculum. For a portfolio assessment to be effective, the means by which it is implemented must provide scaffolding and feedback to learners throughout the portfolio creation process (Segers et al., 2008; Van Tartwijk et al., 2007). Such considerations drove both

the rationale for creating a capstone experience as well as the learning outcomes assessed through The Global Village Playground design effort.

Alignment of Objectives with Instruction

Project Content

Given that the learning objectives were broad intellectual competencies related to global perspectives and higher order thinking, the GVP project content needed to compel learners to engage with global issues. The social constructivist (Duffy & Cunningham, 1996) and problem-based (Barrows, 1986) approaches upon which the course was methodologically based would address the higher order thinking skills by engaging learners in devising a solution to a large-scale, ill-structured problem, namely the development of an ARG. However, learner development of global perspectives would not be fostered by method alone; the content of the game they were to develop needed to center on global issues. In 2000, the United Nations (2005) proposed eight goals for the new millennium and challenged the world to meet these goals by the year 2015. The eight Millennium Development Goals aim to achieve the following:

1. Eradicate extreme poverty & hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

Since these goals align well with several of the core perspectives that are the learning objectives of the course, these goals were selected to constitute both the content and the problems to be solved by this student-designed ARG. In other words, students were to ensure that the game's narrative, challenges, and rewards align with these overarching goals. For example, a game challenge might compel player guilds to collect cans of food and take them to a designated person at a specified food bank who then gives the players their next game clue.

Instructional Activities

Traditional learning game development is driven by the creative process of professional instructional designers (Crawford, 2003; Salen & Zimmerman, 2004); in contrast, the instructional activities for a designed-by-students ARG are driven by the design process and are mainly student led. This process involves creating a coherent game narrative, researching necessary informational and contextual content, structuring the game challenges and rewards, as well as developing the distributed game world. In the case of the GVP *project*, the process would require students to perform the following:

- Devise collaborative solutions to global problems
- Deploy research, productivity, and creativity skills and tools
- Create written design documents, such as narrative outlines, character profiles, research reports
- Deliver presentations to share information, pitch ideas, evaluate progress
- Communicate effectively in small and large groups of diverse membership

- Construct game spaces using a variety of technologies

The design process used for this project was divided into three general phases: Analysis, Design, and Development. The objectives for each phase and the activities that correspond to each are outlined in Table 3.1.

Table 3.1

Objectives and Activities within the Framework of the Design Process

Analysis	**Phase**	**Design**	**Phase**	**Development**	**Phase**
Objectives	*Activities*	*Objectives*	*Activities*	*Objectives*	*Activities*
Explore UN* MDGs** and identify places in the world to potentially impact them	Research and discussion	Evaluate solutions and information gathered in analysis phase and select best alternatives	Achieve consensus through social negotiation	Assess design phase progress and products; evaluate individual progress	Discussion, metacognitive reflection
Devise culturally viable solutions to problems that underlie UN MDGs	Research, discussion, oral & written presentations	Create game tasks/ challenges and rewads for task completion	Oral presentations, written design documents	Devise quantifiable outcomes (win scenarios) for game tasks and develop means to track player progress	Create database and/or spreadsheet tools to track player progress and measure impact of game on MDGs
Identify elements of compelling narrative	Reading, oral and written presentations	Generate overarching game narrative, construct characters, develop "setting"	Storyboard presentations, written design documents	Develop game narrative and character personas	Set up blogs, social networking spaces, digital videos, e-mail accounts
Explore media (text, audio, visuals, etc), technological tools, and their affordances	Research and discussion	Select best tools to convey story, disseminate challenges, embed clues	Written design documents	Construct interactive game spaces, puzzles/challenges	Create dedicated websites, discussion boards, wikis

* United Nations
** Millennium Development Goals

This table is necessarily oversimplified for illustrative purposes, but it serves to demonstrate how the instructional activities are driven by the objectives of the design process. The activities involved in this process subsequently drove the selection of courses from the transfer program curriculum that formed this integrated learning community experience.

Selection of Courses

Identification of courses for which students could earn credit proceeded from an analysis of the tasks that students would perform throughout the process of designing and developing an ARG (Annett, Duncan, Stammers, & Gray, 1971; Kirwan & Ainsworth, 1992). This task analysis led to the identification of five subject areas from the program curriculum upon which the capstone could be based: composition, literary studies, speech communications, humanities, and computer applications. Descriptions of these tasks or activities and their relationship to these areas of study follow.

Composition

The process of designing a game of any genre involves the production of design documents, which provide a record of the game's narrative structure, levels of play, artistic assets, and other technical features. Production of these documents engages designers' writing skills, including consideration of purpose, audience, unity, and coherence, the fundamental elements of written composition. Moreover, since the intention of this game was to address social

issues, such as poverty, health, or gender equity (the UN MDGs), student-designers would need to research potential causes of these issues in their socio-cultural contexts: AIDS in Malawi or malaria in Burundi, for example. Research and documentation are principal competencies in postsecondary English composition courses.

Literary Studies

Because the project scenario involves development of a narrative to contextualize the ARG, student-designers explore various dimensions of literary analysis, including narrative composition, character development, setting, and plot organization. Students not only read literary works, they also create an interactive narrative similar to those found in simulation games like America's Army. Creating the game narrative requires student-designers to synthesize literary pieces with other communications media, make connections between literature and life, and evaluate constructs of reality and fiction. For example, after reading and discussing various literary works and identifying the elements of a compelling narrative, students create the overarching narrative plotline of the game including where game clues or puzzles will be stashed and revealed. Clues might well be embedded in existing narratives, such as the trajectory of Huckleberry Finn's raft down the mighty Mississippi or the species of Faulkner's "Rose for Emily." Student-designers also study archetypal literary characters, such as the evil mastermind, the valiant hero, the comic foil, or the wise fool (Campbell, 1972; Jung, 1958), as they develop characters to further the plotline.

Speech Communications

Design and development of a collaborative project such as an ARG requires extensive use of communication, formal and informal, small and large group, in-class and online. Students generate ideas from small group brainstorming sessions and pitch them to the rest of the design team (persuasive presentations), research content and inform the class about it (expository presentations), and prepare visual media that allows their audience to better understand the ideas and concepts conveyed. For example, after developing an idea in a small group, students pitch a storyboard mockup of an overarching narrative, including profiles of characters and setting and how both might be connected to potential game challenges and rewards. Likewise, after researching gender inequality in a region of the world, the group presents to rest of class how the gender gap might be bridged in way that works within that culture without further aggravating gender inequalities.

Humanities

In addition to literary or written materials, an ARG makes use of visual and auditory media such as music, art, graphics, and even performance. Moreover, since students must tie the game narrative (plot, tasks, and rewards) to the UN Millennium Development Goals, the course involves the study of cultural production (art, music, literature, drama) from a diverse array of continents, nations, and cultures. For example, much like the popular novel, *The DaVinci*

Code, employed classical paintings and accompanying hints via secret messages and documents about what the paintings revealed, students might likewise post a series of visual artifacts relating to child mortality on an obscure South Atlantic island to a blog maintained by a fictional international correspondent whose comments about the images hint at what players should infer from them and what actions they are to take in response to their inferences.

Computer Applications

Students use productivity applications such as Microsoft's™ Office suite to prepare documents, present ideas, and organize course and simulation-game materials. They leverage communication/collaboration technologies to share documents, generate ideas, and search for information. They also develop the game space, distributed across the Internet, with Web 2.0 tools, such as web logs, podcasts, social networking sites like MySpace, interactive and static web pages, and even the 3-D digital world, Linden Labs' *Second Life*. For example, the television show *Lost* has an accompanying alternate reality game called The Lost Experience that provides players with multiple videos uploaded to web sites for fictional airlines, companies like TheHansoFoundation.org, and related campaigns from fictional characters. Through these game media, players investigate what really happened to Oceanic Flight 815. The videos have been reposted to real YouTube spaces with links to social networking sites and message boards such as the creative design team's Web site, thefuselage.com. Such spaces are centered on deciphering the clues embedded within the videos

and images on related sites and support players in their goal of unraveling the mystery that surrounds the show. In player created spaces, players discuss and build digital homages to the show's setting in the virtual world, and some even role-play the individual characters.

Means of Assessment

In a framework driven by the process of designing an ARG, assessment of student learning outcomes at various levels occurs in unique ways. Hickey, Zuiker, Taasoobshirazi, Shafer, & Michael (2006) identify five levels of assessment (immediate, close, proximal, distal, and remote), their primary orientation, and relevant timescales in order to differentiate how they ideally should be assessed given the domain knowledge they represent. The authors show that shifting the summative function of measuring individual student knowledge gains at the distal and proximal levels to a more formative function increases distal and remote level standardized assessment scores. Their argument is that socio-cultural practices at the classroom level of assessment—that is, the immediate, close, and proximal levels--can have an impact on distal and remote assessments when they function formatively for the benefit of students, as opposed to benefiting the teacher. Indeed, the guiding hypothesis of these authors' work is that "focusing on directly collective participation at the immediate and close levels (and in practice, ignoring individual knowledge acquisition) will have a greater *indirect* impact on individual knowledge at the

proximal level and beyond, compared to formative assessment practices that focus more directly on individual knowledge" (Hickey et al., 2006, p. 188).

Although the GVP is not focused on standardized assessments, a key feature of its design is that it shifts state-mandated learning outcomes for a post-secondary general education program (the core perspectives) to a classroom context wherein the objectives of the course are those of the entire program: the set of general education courses that comprise a community college's academic transfer curriculum. What this shift of program-level outcomes to the course-level does is to shift measures of course learning outcomes from distal to proximal-level. Thus, what are summative assessments at the course-level (a presentation given for evaluation of speech outcomes or a research paper composed for a humanities course) can function in a more formative manner because they are contextualized as products in the process of engaging in a large-scale design problem. Thus, they become situative, socio-cultural practices inherent to the process of designing a product, rather than summative assessments of individual knowledge or ability in giving speeches or composing research papers.

Contextualizing these assessment products (student presentations and written compositions) as the central activities of the design process, the principal designer of the GVP hoped to promote attainment of course-level competencies (such as writing, speaking, and listening) as well as the state core perspectives when those artifacts were assembled into student portfolios. The institution might also evaluate a product of "collective participation," the ARG itself and the design

documents, which would accompany it, providing an alternative way to assess program effectiveness.

Overview of Resulting Course Design

The previous sections of this chapter detail the analysis of needs and theoretical framework that supported the design of the GVP capstone experience as conceptualized by the principal designer and author of this dissertation. Following that analysis, the course was then developed collaboratively by the designer and her co-instructor. This process involved some modification to the overarching design.

A Learning Community Experience

As discussed previously, the GVP made use of the learning community approach, integrating multiple course subjects into one class. This approach gave students some enrollment options depending on what courses they had left take. Although preliminary analysis identified computer applications as a subject area for the GVP, institutional constraints precluded it as a course option for enrolling students. The computer applications course in the academic transfer curriculum includes a lab requiring a greater number of weekly contact hours than the other courses identified for this learning community. Thus, the course options were limited to composition, literature, humanities, and speech communications. Students enrolling in this capstone thus had the option of

completing it for any two of those courses depending upon what courses remained in their individual programs of study.

At this institution, ALCE (A Learning Community Experience) courses are team taught, in large part because accreditation requirements dictate that courses be taught by faculty credentialed in the discipline areas for which students will receive credit. The GVP was no exception. The principal designer is credentialed to teach all of the course subjects except speech, and thus identified a co-instructor who fulfilled this requirement. Instructional materials for the course were then developed collaboratively by the two instructors.

Hybrid Delivery Format

Given their respective workloads and schedules, the instructors chose a hybrid delivery format for the flexibility it would provide them and students. The course entailed six contact hours per week, which were divided equally into face-to-face and online instruction. The class met for three hours, one evening each week, accompanied by three hours of online coursework. Online activities included multimedia presentations of course content, interactive discussions among students, peer evaluation, and self-reflective activities. Including an online component, which required students to make use of telecommunications media for collaboration, made sense in a course aimed at fostering 21st Century skills.

The "Learn, then Apply" Approach

The co-instructor had difficulty reconciling her instructional philosophy with the central problem-scenario, designing an ARG, since she had little experience with games for learning. However, she was able to see the connections between such collaborative projects and speech communications, as well as those between literary elements and the narrative structures that underlie ARGs. However, she was uncomfortable having students explore literature and art (a central component of the humanities course) entirely through the process of designing a game. Thus, the two instructors negotiated a compromise between her epistemological need to "cover some material" and wholly contextualizing student learning within the game design scenario of the course. Following a "learn, then apply" approach, course activities were sequenced to allow some presentation of course content during the first four weeks of the semester, followed by three weeks of student exploration of additional course content, and finally an application of that content to development of the game during the last eight weeks.

The Learn Phase

During the first four weeks of the course, instructors led discussions on art and architecture, archetypes and symbols, and elements of effective narratives. The principal texts for this phase of the course included Joseph Campbell's *The Hero with a Thousand Faces* and Tom Stoppard's *Rosencrantz and Guildenstern are Dead*. Students prepared and gave presentations, as well. For example, they

developed a superhero alter-ego for themselves and gave a speech of introduction, introducing themselves by describing their “character,” an activity combining literary, speech communications, and game design features. Student teams also gave presentations on the stages in the hero’s journey that they read about in Campbell, providing examples of these stages from literature, art, and film.

The Explore Phase

During the next phase of the course, student teams worked through what came to be called the culture project. Preliminary work on this project began during the last weeks of the learn phase with students identifying the major works of literature, art, or architecture of a selected culture. They first prepared proposals justifying their selection of these works, followed by an annotated bibliography of resources regarding these works. The entire class then read the proposed literature selections, and each team gave an informative presentation to the class. The presenting team also led an online discussion about the culture explored.

The Apply Phase

The last eight weeks of the course were dedicated to applying concepts learned about archetypal narratives and symbols, as well as other cultures to the design and development of an ARG. Although this was a project involving the entire class, students broke into smaller brainstorming teams working on different

levels of the game, then pitched ideas to the rest of the class, discussed alternatives, and built consensus regarding the overall narrative and game structures. Class meetings would close with students assigning tasks to individuals to complete before the next class. Online communication tools provided a means to share ideas and document progress. The next class meeting would begin with each student giving a walk-through of what he or she had completed, followed by peer evaluation or discussion. Then the process (break out, come back together, assign tasks) was repeated.

Summary

Design of the GVP began with front-end analysis of the learning outcomes desired by employers, state agencies, and the institution where the GVP was implemented. Selection of course content, instructional methods, and the central problem-scenario were governed by these needs and supported by the research literature. The development of the course proceeded collaboratively with both course instructors, yielding a capstone learning experience that was mutually agreeable to both instructors' beliefs about teaching and learning. The next chapter describes the methods of research used to evaluate the effectiveness of this innovative instructional design.

CHAPTER 4

RESEARCH METHODOLOGY

Introduction

This study examined the Global Village Playground (GVP) in a naturalistic classroom context. Given the intricacy of the design and the blended modes of instructional delivery, the GVP is laden with a complexity that is not conducive to an experimental design that controls for discreet variables. Moreover, the primary researcher of this study was both the designer of the GVP and a co-instructor of this team-taught course. Because of these factors and the intimate size of the class, this study took a qualitative case study approach to the evaluation of the pilot implementation of the course design. This approach allowed a deeper analysis of the complexities of the design and participant experiences with them, including how well elements of the design met their learning needs or presented challenges to them. The following research questions framed the study:

1. What were student and instructor reactions to the course/course design?
2. What aspects of the design were most conducive to student learning?
3. To what extent did the course promote attainment of the overarching program objectives (core perspectives) and/or advance conceptual age thinking?
4. What challenges or tensions arose from the design?

Philosophy of Inquiry

A researcher's belief about the nature of knowledge and how it comes to be known underlie the methods of inquiry used to discover knowledge and the conclusions drawn through analysis. Consequently, it is imperative to identify the researcher's ontological and epistemological assumptions prior to proceeding with the inquiry. Ontological suppositions about "what is" and epistemological convictions regarding "how it can be known" have a direct bearing on "what it *means*," the interpretations or generalizations that are drawn from the results. Thus, these underlying perspectives must be consistent with the methods employed to seek and make sense of the phenomenon explored through research (Bernstein, 1983, 1993).

The positivist approach to studying phenomena has provided the foundation of scientific inquiry for several centuries (Denzin & Lincoln, 2003; Hollis, 1994). This approach supposes a reality outside of the human mind that can be observed, measured, and understood through the human senses. The tools employed in empiricist methods of inquiry allow a researcher to draw conclusions about this observable reality that are deemed to be objective, that is devoid of the subjective biases of the researcher (Bernstein, 1976, 1983). Depending on the degree to which confounding factors are controlled, the measured phenomenon is open to interpretations that "generalize" to other contexts. An opposing perspective, the relativist stance, presumes that no

objective reality exists outside of the human mind, or if it does, it cannot be understood objectively because it is measured and analyzed through tools of human construction, including methods of inquiry (Denzin & Lincoln, 2003, 2008; Guba & Lincoln, 1989). At a minimum, this perspective maintains that interpretations of observed phenomena are limited by the subjective biases of the researcher and to the specific context in which they were observed.

The constructivist, also called contextualist or hermeneutic perspective, finds that reality is socially constructed through negotiation among groups of people. As such, it is neither devoid of the subjective biases of the members of the group nor divorced from the socio-cultural and political context in which it is situated (Bernstein, 1983; Guba & Lincoln, 1989). Constructivist inquiry does not attempt to control for the influences of subject or context, but rather to account for them. Such methods acknowledge the influences on interpretation, but present them fully so that others may draw their own inferences about the usefulness of the observed phenomena based on their own situational contexts. According to Denzin and Lincoln (2008), “terms such as *credibility*, *transferability*, *dependability*, and *confirmability* replace the usual positivist criteria of internal and external validity, reliability, and objectivity” (p. 35). As designer, instructor, and researcher of the GVP, the constructivist perspective guided the curricular design, the methods of instruction, the process of inquiry used to evaluate it, as well as the claims made regarding its effectiveness.

Educational Evaluation

According to Gall, Gall, and Borg (2007), educational evaluation is "the process of making judgments about the merit, value, or worth of educational programs" (p. 559). These authors further find that evaluation research plays a key role in educational research and development (R&D), "an industry-based development model in which the findings of research are used to design new products and procedures, which are then systematically field-tested, evaluated, and refined until they meet specified criteria of effectiveness" (p.589). This study follows an educational R&D approach. The GVP was designed based on research findings identifying skills necessary to academic and professional success (Peter D. Hart Research Associates, 2008; Pink, 2006), as well as findings supporting the use of instructional strategies to facilitate gains in the acquisition of those skills (Albanese & Mitchell, 1993; Warren, Barab et al., 2008; Warren & Dondlinger, 2008c). This front-end analysis on the part of the principal designer involved "judgments about the merit, value and worth" of these research findings throughout the process of selecting appropriate instructional methods, materials, and technologies. Nevertheless, this designer does not view her judgments to be infallible; she seeks the perceptions of other participants in the implementation of this design in order to better judge its merits and refine the design.

Levels of Evaluation

Kirkpatrick (1994) identifies four levels of evaluation, which represent a sequence of ways to assess the effectiveness of instructional programs. He argues that "Each level is important. As you move from one level to the next, the process becomes more difficult and time-consuming, but it also provides more valuable information. None of the levels should be bypassed simply to get to the level that the [evaluator] is interested in" (p. 21). A description of each of these levels follows:

1. *Reaction* elicits the general reaction of the participants to the instructional program. Kirkpatrick calls this the "customer satisfaction" measure and asserts that even compulsory programs should attempt to elicit favorable reactions. If participants do react favorably, the program might well be abandoned for another that does.
2. *Learning* seeks to evaluate what and how much learning resulted from participation in an instructional program. According to Kirkpatrick, learning is "the extent to which participants change attitudes, improve knowledge, and/or increase skill" (p. 22).
3. *Behavior* is defined as "the extent to which change in behavior has occurred" as a result of participation in a program (p. 23). Kirkpatrick cautions against skipping the first two levels of evaluation and relying solely on measures of behavior change because many factors might prevent participants from performing differently even though they have

attained a change in attitude, knowledge, or skill. For example, the organizational climate might discourage the change in behavior even when learning (a change in attitude, knowledge, or skill) has occurred.

4. *Results* aims to evaluate the broader impact on an organization that an instructional program creates. For example, a program on servant leadership might be expected to yield fewer complaints about mid-level managers or an increase in morale at an organization.

While Kirkpatrick's model applies specifically to training rather than educational programs, the sequence of levels provides a meaningful way to conceptualize the evaluation of an educational R&D. The goals of each level can be adapted to the uniqueness of an educational setting. Indeed, these levels shaped the principal research questions for this study and consequently the *themes* to be explored through the inquiry. An explanation of those themes and their relationship to Kirkpatrick's levels of evaluation is provided in the next chapter.

Fourth Generation Evaluation

Guba and Lincoln's (1989) *Fourth Generation Evaluation* is a qualitative approach to educational evaluation. This comprehensive methodology seeks "*full participative* involvement, in which the stakeholders and others who may be drawn into the evaluation are welcomed as equal partners in every aspect of design, implementation, interpretation, and resulting action of an evaluation" (p. 11). The GVP emerged as a capstone experience that arose from the "claims, concerns, and issues" of institutional stakeholders in need of a means to

evaluate the effectiveness of their academic transfer program. However, comprehensively evaluating that program was neither the charge to the designer nor the purpose of this study. The designer/researcher championed what she presumed to be the student perspective in proposing an engaging capstone experience for students in lieu of an additional mandatory assessment piled on top and outside of the existing course load required for completion of this program. Although evaluation of the entire program is outside the realm of the designer/researcher's control, those in charge of that process welcomed this approach because of their dedication to meeting student needs. To a certain extent, this study is situated between an emerging evaluation of an academic transfer program and the specific, bounded case of the pilot implementation. The results may shape the approach the institution takes in evaluating the program.

Results notwithstanding, this study focused specifically on obtaining participant perceptions of their experiences in the pilot implementation. The claims, issues, and concerns of institutional, business and industry, as well as state-level stakeholders informed the design of the GVP. The purpose of this evaluation was to gather and analyze the claims, issues, and concerns of participants in the pilot concerning the effectiveness of the design: their reactions, learning, values or behaviors, and the results or challenges experienced within the course pilot. This input will help us evaluate the capstone experience itself and inform refinements to the design so that it might better meet the needs and goals of all.

Case Study Research

The research design follows a qualitative case study approach, which investigates “a contemporary *phenomenon* within its real-life *context* especially when the *boundaries* between the phenomenon and context are not clearly evident” (Yin, 2003, p. 13). In this case, the *phenomenon* is student perceptions of their learning experiences within the *context* of the pilot implementation of the GVP. Given the nature of the GVP as a capstone experience, the boundaries between student perceptions (*phenomenon*) and the GVP (*context*) will not be clearly evident. Students’ prior and concurrent learning experiences will necessarily come to bear on their perceptions as they are expected to be drawn upon in a capstone environment. Nevertheless, a case must be defined by some form of the limits or boundaries, so that it in can be explored in its totality (Stake, 1995). These boundaries might be location or setting, a specified duration of time, or an attribute that defines the participants in the study (Yin, 1993). The boundaries of this case include the duration of the semester-long implementation, all of the individuals who participated in the course, as well as the class settings, both online and on the ground.

Context of This Study

Setting

The setting for this research study was a sixteen-week course at a large, urban, community college in the southwest United States. The course was an

integrated, learning community experience wherein students elected to enroll for credit in two of four possible disciplines: speech, literature, humanities, or composition. The course design blended face-to-face class meetings with online learning and communication tools, in keeping with current practices in a global workplace wherein problems are solved and projects are developed across expansive geographical distances via various digital telecommunications media.

Institution

The institution where this course was implemented is one of seven, separately accredited colleges in a large multi-college district. Of the seven colleges, this is the largest institution with enrollments exceeding 16,000 students during the implementation semester, the highest achieved by this college. The student body is "internationally and ethnically diverse, speaking over 90 first languages," and enrollment is approximately 42% Anglo, 21% African-American, 19% Hispanic, and 15% Asian (Richland College, 2009a). The college is dedicated to providing high quality instruction and support services for students and has received state and national quality awards for their efforts. The college's vision is "to be the best place to teach, learn, and build sustainable local and world community" (Richland College, 2008). Core institutional values are integrity, mutual trust, wholeness, fairness, mindfulness, cooperation, diversity, responsible risk-taking, joy, and considerate, meaningful communication (Richland College, 2008).

Classroom

Class meetings were held in an innovatively designed classroom, dubbed a *Learn Lab*. These learning spaces make use of moveable furniture and multi-media technology designed to promote collaboration. Figure 4.1 depicts the overall configuration of this learning space. A Learn Lab features rectangular tables, which accommodate two learners to a side, arranged into pods of four tables that seat eight students. Each lab has four pods configured into an X, so that the space has no front or back. Moreover, the tables that make up each pod can be separated into smaller units accommodating four or two students.

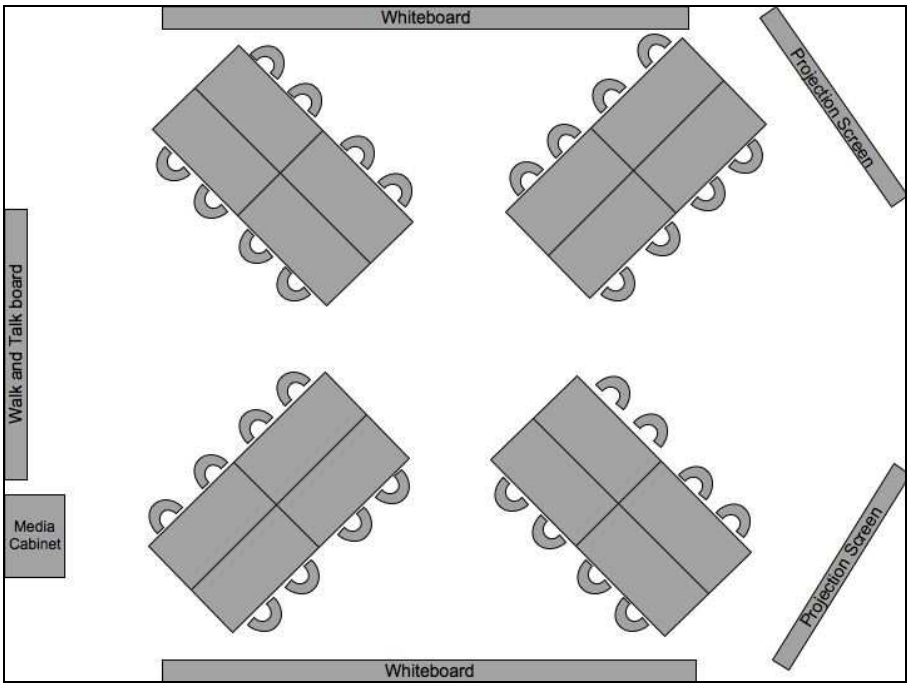

Figure 4.1. Learn Lab classroom configuration.

The room also has expansive whiteboards, complemented by mobile racks of mini-white boards. Called *huddle boards*, because learners can huddle around

them, these boards have clips that allow them to be hung for display and discussion with the rest of the class after learners have completed their “huddle.” Wide lens cameras installed above the whiteboards allow users to capture images produced on the whiteboards and huddle boards, so they may be distributed digitally. The room also features three data projectors and display screens, one of which is an interactive, multi-touch screen or *Walk and Talk* board.

Participants

Participants included the six students who completed the course, as well as the two instructors who taught the course, one of whom is the primary researcher and author of this study. Descriptions of each participant, who have been assigned pseudonyms, follow.

Karen, an education major, was a returning student in her early 40s—a factor that had a strong influence on her perceptions. “One frame of reference is that I am the eldest person in the class, with the most life experience.” She is a mother and a grandmother who frequently expressed heartfelt devotion to her family. Karen loves to travel and intends to “see as much of the planet” as she can while she’s “here on it.” In fact, she took advantage of an unanticipated opportunity to go to Prague during the semester of this study. Karen is open-minded, demonstrated a passion for learning, and was willing to take risks and just try new things. Indeed, she had “never set foot” on the campus of the institution where the GVP was offered. She attended another college in this multi-

college district but chose to travel to this institution because she was captivated by this innovative course.

Kevin, a Caucasian student in his early 20s, was poised to be the first graduate from the college's new Interactive Simulation and Game Technology program (ISGT), where he worked part-time as an assistant to the program coordinator. He was very much viewed as a leader among his peers in ISGT, two of whom were participants in the GVP. Kevin began his academic career studying metaphysics and engaged deeply in class discussions. Although Kevin is soft-spoken, he holds strong convictions. He confessed, "sometimes there [are] certain topics that I tend to shut down on because there's no way I'm going to change my view on it." Throughout the class, he did seem to challenge only his fellow ISGT peers and seemed uncomfortable taking an oppositional stance with the other participants. Kevin's primary passion is drawing. The instructors often observed him sketching ideas being discussed in class rather than taking written notes. His sketches often illuminated concepts for the other participants.

Les, a Hispanic student in his early 20s, was also an ISGT major and an artist. As he describes himself, "I'm more of an artist person…I come from a background where I just kind of design." Les was more practical than Kevin, however, and seems to ascribe this quality to family influences, "my dad's a civil engineer so I kind of grew up…discussing buildings and little technical things." Les was quieter than the other participants. Although he found that the course environment allowed them "to have our thoughts and ideas said more openly,"

Les tended to be a listener and thinker, rather than a talker. He explained in his interview, “I did listen things out. And I try to manage where I can talk and where I shouldn’t. ‘Cause you know, if I don’t have credibility on the subject what good does that [speaking] do me?” The instructors found Les to be highly engaged, but also very cautious, introspective, and courteous.

Nick, a Caucasian student in his early 30s, was an introspective participant as well. He was more vocal in class discussions than Les, but much preferred one-on-one interactions to larger group discussions. Nick developed a close friendship with Karen early in the semester. But a bad experience on a team project with another participant later soured his experience for the remainder of the semester. Nick was widely read and could converse at length on a variety of subjects and make connections between seemingly disparate phenomena with ease and clarity. He has a passion for food: how it is produced, processed, and prepared. Nick was a chef for a number of years before returning to college, preparing to transfer to a baccalaureate program. He indicated that he was recovering from substance abuse, a struggle that likely played a role in his social anxiousness and uncertainty. The class learned much from Nick, particularly about engineered food, pharmaceutical colonialism, and systemic ways of thinking.

Adam, a Caucasian student in his early 20s, was the only student other than Nick who was an academic transfer major, “going for an associate of sciences degree.” Adam was an enthusiastic participant in in-class activities.

However, he displayed many of the characteristics attributed to Generation Y (Armour, 2005, November 8). He had a great deal of difficulty self-regulating, frequently blurting out irrelevant or tangentially related comments while others were speaking and fidgeting unremittingly. These behaviors distracted and annoyed the other participants to such an extent that they virtually ostracized him from the group by the end of the semester. He didn't seem to notice this, however. His demeanor was always positive, even bubbly. He contributed terrific ideas when he was focused. Unfortunately, he was unable to follow through on them. When he made it to class, he was usually very late and rarely had prepared what had been assigned to him by either his teammates or the instructors.

Michael was the other ISGT major, and like Les and Adam was in his early 20s. The only African-American participant, Michael shared some of his cultural heritage in class discussions. He described himself as "a very strong opinionated person" who keeps his "opinion lax." He was observed to be quite accepting of others viewpoints, yet resolved in his own convictions. Michael engaged readily in class discussions. He often took a leadership role in the development of the game, drawing others back to task, and even proposing the overarching symbol or organizing metaphor for the game: The Four Horsemen of the Apocalypse. He was not as productive outside of class between class meetings. He spoke at length in his interview about his need to be more disciplined, particularly when others were relying on him to get things done.

Trina was the co-instructor for the course. She has over 30 years of experience teaching speech communications, English (both composition and literature), and psychology in the community college setting. She was actively involved in the Study Abroad and Honors programs at the college, and has won the college Excellence in Teaching award. She described her instructional role as "a real cheerleader and encourager," a role which I feel she executes with enthusiasm, insight, and deep care for students. Her instructional philosophy is quite humble: "I don't teach them anything. If the student isn't ready, I can't teach. My job is to inspire and make them receptive, and then *own* their … learning. I also see my job as helping them make connections between other disciplines." Trina did not have much experience teaching with technology, but wants to learn more. She regrets that she "didn't come along as fast with the technology because [she] had to teach another course that was a totally brand new" during the GVP semester. A testament to her willingness to take risks and experiment with new approaches, she described teaching the GVP as "jumping over a cliff into the darkness," a risk she was willing to take "to get an opportunity to teach with Mary Jo."

Mary Jo was the other instructor for the course, the primary designer of the GVP, the principal researcher for this study, and author of this dissertation. Her view of her role as an instructor is nearly identical to Trina's: encourager and enabler of learning. Mary Jo has taught English and humanities in the community college setting for over ten years. Unlike Trina, however, her experience teaching

with technology includes designing, developing, and teaching online courses, as well as integrating technology into face-to-face instruction.

Data Collection

The text of the case for this study was created using data collected from a variety of sources, a practice in keeping with Merriam's (1988) assertion that multiple sources of data inform interpretations of the case. The primary method of collection was semi-structured interviews conducted with students and instructors near the end of the implementation. In addition to the interviews, course documents, student posts and responses in online discussion boards and web logs were also collected.

- *Observations* of sessions of the course were made by the researchers who later conducted interviews with course participants. These observations served to orient the researchers to the dynamics of participants and course activities. They also provided participants with a degree of familiarity and comfort with the researchers.
- *Interviews* were conducted by non-participant researchers. All participants, including the instructors, were interviewed. Student interviews followed a semi-structured approach, which asked them to tell what they learned about each of the core perspectives and identify what they learned about them in other courses, in this particular course, and whether the course project (developing an ARG) had an impact on what they learned about each perspective.

- *Course Documents* were collected, including the course syllabus, assignment sheets, scoring rubrics, student papers, media presentations, portfolios, and game design documents.
- *Online Discussions & Weblogs* were collected and archived, capturing both student posts and responses to those posts by other students and the instructors.

As indicated above, the primary source of data for analysis was the transcript of interviews with participants. Other forms of data documented students' active involvement in the learning activities of the GVP but did not necessarily elicit their perceptions of those activities. As such, these data sources served to triangulate the interview data, and provided further grounding for assertions made about student perceptions. One follow up interview was conducted with a student participant after the data collection period had ended because analysts agreed that passages in the transcript were overtly led by the interviewer and required clarification. However, this student's responses were the only ones that the researchers found to require this member check.

Data Analysis

Interpretations derived from qualitative analysis, as with any inquiry approach, must be grounded in the data collected. Grounding assertions from within the data allows researchers to make interpretations that can be considered representative of the observed phenomena. Evidence for interpretations in this study were obtained from multiple sources, principally each participant involved

in the pilot implementation. Additional sources of data in the forms of discussion logs, web logs, course documents, and researcher observations served to triangulate the findings. In order to further assure the credibility of the interpretations, three researchers analyzed the data, identifying the emergent patterns within it, and constructing consensus regarding these interpretations.

In order to systematically analyze this data, a constant-comparison approach to interpretation was taken by the research team (Glaser & Strauss, 1967; Strauss & Corbin, 1998). The constant-comparison method began with identifying codes, a process of assigning labels or meanings to units of text. As codes were identified, the researchers compared these codes to each other, identifying similarities, differences, and patterns among them. By constantly comparing the codes to the text, the researchers continued to refine the labels of the codes and the meanings they assigned to them. As a result of this process, assertions made about the data were supported or *grounded* in the data (Miles & Huberman, 1994).

According to Strauss and Corbin (1998), coding procedures for the constant-comparison method of analysis involve three phases: open, axial, and selective coding. During *open* coding, the researchers code the textual data, capturing properties discovered in the text. They also build categories of these codes by constantly comparing the codes to the text and to each other, identifying commonalities among codes and grouping similar codes together. *Axial* coding takes a more focused pass through data. In this phase, the

researchers examine whether the codes and categories that emerged through open coding, adequately capture the essence or *axis* of the data they represent. As such, axial coding analyzes the codes and categories themselves and continues the refinement of labels as well as the generation of new categories, subcategories, and codes. By the final phase, *selective* coding, the researchers have identified the principal themes among the categories. During selective coding, examples are selected from the text that illustrate these themes and further inform comparisons or contrasts within and among them.

In this study, analysis of the data included coding the transcripts of interviews all six students and the two instructors who participated in the course. Combined, these transcripts include 1260 passages, 35,660 words, and 195,242 characters, or 91 pages of text, including interviewer questions. Participant responses were coded line by line; interviewer questions were not coded, except in instances where the interviewee responded with an affirmation or negation, such as “mmm hmm” or “not really,” of a statement offered by the interviewer. Although identification of codes and categories was guided by the “themes” or levels of evaluation (Kirkpatrick, 1994) outlined earlier in this chapter, the researchers worked in concert during *open* coding to identify emergent codes and categories within each theme and to construct a mutual understanding of the text, themes, categories, and codes. Emergent codes were constantly compared to previously identified codes, collapsed into categories representative of their

similarities, and refined as additional codes and categories emerged. This process prompted further refinement of the themes as well.

Since many passages within the text informed multiple themes, the text was segmented into four separate documents representing each theme prior to axial coding. Most of the text was duplicated in more than one theme; several passages were included in all four themes. All of the data collected from student interviews was coded at least once--in other words, in at least one theme. Data from instructor interviews was included only in the fourth theme pertaining to overall results of the evaluation. Categories and codes in this theme were generated first from student interview data, and instructor interviews were coded using those codes and categories. A few additional codes that informed the tensions and successes of student experiences with the course emerged from the instructor data and were added to the existing categories. Passages that pertained exclusively to instructors' perceptions and approaches to teaching and learning were not coded, but were used to construct the instructor descriptions given above.

All phases of the coding were completed by three researchers. Open coding was conducted in concert with at least two researchers present. This coding was cross-checked later by a third researcher when only two researchers had been present. Disagreements in the assignment of codes were discussed until consensus was achieved among the three researchers. After open coding, the researchers separately performed the axial coding. Disagreements in the

assignment of codes and the “fit” of codes or categories were discussed until consensus was achieved among all three researchers. Selective coding was conducted by the principal researcher (author) and verified by at least one other researcher.

Summary

This qualitative case study was an evaluation of an educational research and development, namely the GVP. The researcher approached this evaluation from the constructivist-interpretive inquiry approach, using a constant-comparison method to build interpretations of participant perspectives on their experiences with the GVP. In order to establish “credibility, transferability, dependability, and confirmability,” the interpretive process of coding was completed with two other researchers. Thus, the interpretive claims presented in the following chapter can be said to have been validated by multiple coders and are therefore grounded in the data collected.

CHAPTER 5

RESULTS

This chapter presents the results of the study, beginning with the coding procedures and methods used to interpret their weight or strength relative to the total text. These procedures are followed by an overview of each of the themes of analysis, which were derived from Kirkpatrick's (1994) levels of evaluation and the research questions asked in this study:

1. What were student and instructor reactions to the course design?
2. What aspects of the design were most conducive to student learning?
3. To what extent did the course promote attainment of the overarching program objectives (core perspectives) and/or advance conceptual age thinking?
4. What challenges or tensions arose from the design?

The remainder of the chapter presents the categories and codes within each theme, discussing their relative weights within the total text, theme, and category in which they're situated. So that the reader might distinguish among the labels for codes, categories, and themes more easily, *codes* are italicized, **categories** are bolded, and ***themes*** are bolded and italicized.

Analysis Procedures

After segmenting the data into the four themes, the researchers coded each theme line by line, continuing to compare the data with the codes, generating additional codes, and refining the code and category labels. A total of 1107 passages and 35,410 words comprised of 191,693 characters were coded, yielding 27 categories and 157 unique codes. The amount of text that comprises the categories within each theme is presented in Table 5.1.

Table 5.1

Amount of Text Assigned to Categories within Each Theme

Theme	Categories	Codes	Passages	Characters
Reaction	**Overall Reaction**	3	25	1892
	Prior Experiences	4	17	2019
	Technology	3	16	2416
	Course Format	3	13	2208
	Instructional Design	6	45	7750
	Instructors/Learning Environment	3	27	3216
	Peers/Other Students	3	13	1511
	Theme Totals	**25**	**156**	**21,012**
Learning	**Prior Knowledge**	3	60	11,575
	Self-Reflection	7	107	20,859
	Motivations	5	15	3100
	Instructors	3	6	776
	Course Content	7	37	8387
	Teamwork	6	89	12,669
	Game Design Scenario	7	54	13,132
	Technology	4	38	5834
	Theme Totals	**42**	**406**	**76,332**
Behavior	**Individual or Personal Values**	7	31	9138
	Respect for Others	6	55	11,851
	Social Responsibility	4	16	2849
	Open-mindedness	4	26	6491
	Knowledge Construction	5	82	16,898
	Theme Totals	**26**	**210**	**47,227**
Results	**Curriculum & Assessment**	10	60	9797
	Instructional Methods	15	104	17,694
	Course Format	8	34	4624
	Technology	7	31	5637
	Students	13	64	11,651
	Epistemology	7	30	5730
	Institution	4	12	1432
	Theme Totals	**64**	**335**	**56,565**
Text Totals	**27**	**157**	**1107**	**201,136**

In order to determine how much of the text each category represents, both the percentage of characters and the percentage of passages for each category were calculated and averaged. While the percentage of characters gives a fair depiction of how much of the entire text each category represents, it does not account for how often a category or code occurs within the text. For example, one or two interviewees might respond at length about a given aspect of their experience while others do not address that same topic at all. This could yield a substantive amount of text that occurs only once or twice within all of the data. Conversely, however, calculating only the percentage of occurrences—or passages—does not account for how much text comprises each category and code. Some codes, for example, occur repeatedly throughout the text, but responses are brief. Compare the number of passages and characters for **Overall Reaction** and **Open-mindedness** in Table 5.1 above. Each has an approximately equal number of passages, 25 and 26 respectively. However, the amount of text (number of characters) for each is quite different: 1,892 for **Overall Reaction** and 6,491 for **Open-mindedness**. Thus, **Open-mindedness** accounts for a little more than three times as much text as **Overall Reaction**. To best capture both the number of occurrences and amount of discourse attributed to each category and code, both the percentage of passages and the percentage of characters were calculated and then averaged. This statistic, presented as the

Passage/Character Mean percentage, was used to further analyze and interpret the text.

Description Of Themes

As explained previously, analysis of the interview transcripts was shaped in part by the research questions, which were shaped in turn by the overall purpose of evaluation research. The preliminary "themes" to be explored in this evaluation study parallel the four levels of evaluation that Kirkpatrick (1994) describes in *Evaluating Training Programs*: reaction, learning, behavior, and results. The first theme in this analysis, ***Reaction***, includes categories and codes that pertain to students' reactions to various aspects of the GVP, such as the instructional design, the hybrid format of the course, use of technology, the learning environment created by the instructors, and their interactions with other students. The ***Learning*** theme shifts away from Kirkpatrick's level somewhat. Rather than providing evidence of *what* or *how much* learning occurred, this theme captures *how* learning occurred in the course: what motivated students to learn, what learning preferences students possessed, what role the content presented in the course played in students' learning, and what impact the game design scenario had on their learning. The behavior level of evaluation assesses the extent to which participants change how they perform as a result of participating in a given training program. In this study, it was not possible to examine changes in learner behavior after completion of the course, nor was it

part of the overall purpose of evaluating a pilot implementation, which was focused on collecting and interpreting data to inform refinements of the design prior to further implementation. Instead, this theme assembles evidence in student interviews that suggest changes in thinking, values, attitudes, and behaviors as a result of their experiences in the GVP. A further discussion of this theme follows in the next paragraph. The final level, ***Results***, attempts to determine the wider impact that a training program has on an organization, which is often difficult to evaluate. In the case of the GVP, this level or theme specifically identifies what worked well and what didn't, the tensions and successes that occurred in this semester-long implementation.

Although a more detailed description of each theme, along with its corresponding codes and categories is provided later, the author finds it imperative to further define the third theme prior to proceeding. Throughout the process of constantly comparing the text with the emerging codes, categories, and even themes, the label for and understanding of this theme underwent more reconstruction and refinement than any other theme. At one point, the researchers called it ***Values***, but soon found that the text informing this theme also included patterns of *thinking* valued in the conceptual age (Pink, 2006). However, labeling the theme ***Conceptual Age Thinking*** seemed to limit the category to thinking patterns alone, excluding many of the personal, as well as the broader socio-cultural values that individual students described in their interviews. Thus, the "working label" became an accretive one, containing

several descriptors separated by slashes: ***Behavior/Values/Attitudes/Conceptual Age Thinking***. The principal researcher resolved to call this theme, ***Empathic Thinking***, purely for the purpose of reporting the results here. This label seemed to capture both the cognitive and affective learning that students reported in their interviews. Ultimately, however, that label didn't capture the spirit of this level of evaluation.

The behavior level evaluates whether the learning that occurs in an instructional program has an impact on the learner's performance of his or her job. In other words, the learning level evaluates whether, what, and how much participants learned, while the behavior level evaluates whether they *apply* what they have learned to the performance of their respective jobs. In essence, this level of evaluation examines transfer of learning from the context of the classroom to the actual job. Once again, in the case of the GVP, assessing learner performance after the course ended was not within the scope of this research study. Instead, what this theme is about is whether students, in their self-reports during interviews, provide evidence that they have to some degree internalized the values, attitudes, and patterns of thinking that were the overarching goals of the design, such that those outcomes might govern their behavior or performance in the future. Consequently, this theme was labeled ***Transfer***. This label accounts for the cognitive and affective learning that might have occurred. It also broadens the label of the theme from the specific goals of this course—fostering conceptual age thinking and the various values and

attitudes represented by the core perspectives—to the goals of this particular level of evaluation: application of learning to new contexts. The author did not want to further limit the theme to ***Knowledge Transfer*** only, as many of the codes and categories within it relate to learning that had a perceived impact on students' internalizing and reconstructing the value structures that ultimately govern their behavior.

A total of 157 codes were assigned to 27 categories within the four themes of analysis. The seven categories in the ***Reaction*** theme account for the smallest portion of the total coded text (12.5 %) while the eight categories in the ***Learning*** theme account for the most (35.8%). Figure 5.1 visually represents the magnitude of each portion of the overall text captured by each theme and similarly displays the weights of the categories that comprise them.

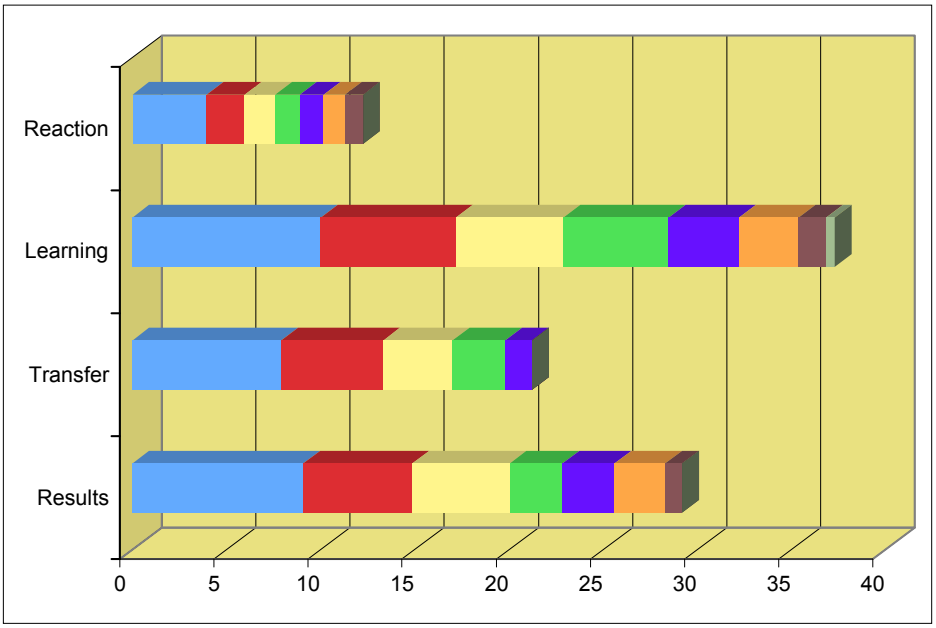

Figure 5.1. Composition of themes.

The ***Results*** theme contained the most codes, more than twice the number of codes in the ***Reaction*** and ***Transfer*** themes, in large part because the researchers identified separate codes related to tensions and successes within each category. Table 5.2 presents the P/C Mean percentage for each theme, along with those of the categories within each. It also presents the P/C Means of each category relative to its respective theme, as opposed to the overall text.

Table 5.2

Passage/Character Mean Weights for Themes and Categories

Theme	Categories	# Codes	P/C Mean % of Theme	P/C Mean % of Total Text
Reaction	**Instructional Design**	6	32.86	3.96
	Instructors/Learning Envir.	3	16.31	2.02
	Overall Reaction	3	12.52	1.60
	Technology	3	10.88	1.32
	Prior Experience	4	10.25	1.27
	Hybrid/ALCE	3	9.42	1.14
	Peers/Students	3	7.76	0.96
	Theme Totals	**25**	**100.00**	**12.27**
Learning	**Self-Reflection**	7	26.84	10.02
	Teamwork	6	19.26	7.17
	The Game	7	15.25	5.70
	Prior Knowledge	3	14.97	5.59
	Course Content	7	10.05	3.76
	Technology	4	8.50	3.17
	Motivation	5	3.88	1.45
	Instructors	3	1.25	0.46
	Theme Totals	**42**	**100.00**	**37.31**
Behavior	**Knowledge Construction**	5	37.41	7.90
	Respect for Others	6	25.64	5.43
	Individual Values	7	17.06	3.67
	Open-mindedness	4	13.06	2.79
	Social Responsibility	4	6.83	1.43
	Theme Totals	**26**	**100.00**	**21.23**
Results	**Instructional Methods**	15	31.16	9.10
	Students	13	19.85	5.79
	Curric. & Assessment	10	17.62	5.15
	Technology	7	9.61	2.80
	Epistemology	7	9.54	2.78
	Course Format	8	9.16	2.69
	Institution	4	3.06	0.90
	Theme Totals	**64**	**100.00**	**29.19**
Text Totals	**27**	**157**		

Detailed descriptions of each of the themes, including the categories within them and the codes that make up each of the categories follow in the remaining sections of this chapter.

Reaction Theme

Based on the P/C Mean percentage, the ***Reaction*** theme represents the smallest portion of the total text, 12.5%. This theme includes seven categories comprised of 25 unique codes, and 156 passages made up of 21,012 characters of text. The categories and codes that underpin them paint a picture of students' reactions to various aspects of their experiences in GVP, including elements of the problem-based instructional design, the hybrid or blended format of the course, the learning environment created by the instructors, and their interactions with other students. Figure 5.2 shows the P/C Mean percentage of each category within this theme, as opposed to its percentage of the entire text.

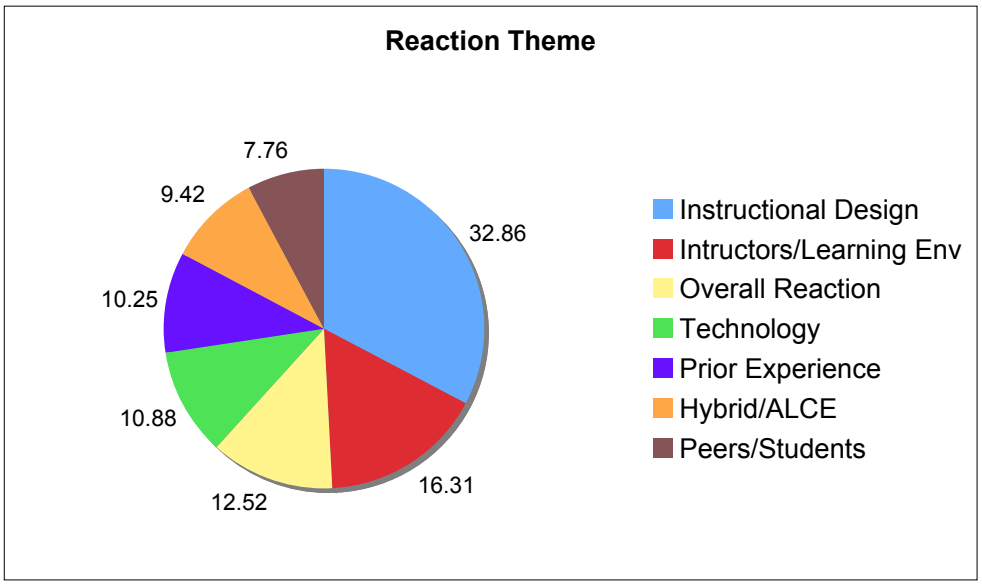

Figure 5.2. P/C mean percentage of text in Reaction theme by category.

Of the seven categories, **Instructional Design** was by far the largest, representing almost a third of the text in this theme. The **Learning Environment** fostered by the instructors was also a significant category of students' reaction to the course, representing over 16% of this theme. Data capturing students' **Overall Reaction** was the third strongest category, while **Technology**, **Prior Experience**, and the **Hybrid** and learning community (**ALCE**) formats of the course were roughly equal at about 10% each. The remainder of this section details the codes that underpin each of these categories.

Instructional Design

By far the largest category in this theme, **Instructional Design** contained 6 codes representing 32.86% of the data in this theme and 4.05% of the Total Text analyzed in this study. Table 5.3 displays each of the codes and their relative weights within the category, the ***Reaction Theme***, and the total coded text.

Table 5.3

Codes in Instructional Design Category

	Pass	Char	% of Category	% of Theme	% of Total Text
Activities/Tasks	11	1696	23.16	7.56	0.92
Course Sequence	5	1717	16.63	5.69	0.65
Course Structure/Flow	7	1290	16.10	5.31	0.64
Teamwork/Comm.	8	969	15.14	4.87	0.60
Connections among tasks	7	1122	15.02	4.91	0.60
Game Scenario	7	956	13.95	4.52	0.55
6	**45**	**7750**	**100.00**	**32.86**	**3.96**

Within this category, the *Activities/Tasks* code represents the largest segment of the data. Students enjoyed the discussions and preferred the team assignments to more traditional instructional methods. As one student expressed it, “I do like [group projects] better than just having assigned readings out of a textbook.” Another commented that the “class was really talkative and everybody had their own ideals and kind of fueled the fire for discussion.” Related to that is a comment made by Kevin coded as *Teamwork/Communication*, “I like classes where you have discussions and kind of learn people’s opinions. Learning through that…learning through other people, your peers.”

The *Course Structure/Flow* code captures reactions such as Kevin’s observation, ”I think, it was more structured in the very beginning.” For Nick, the course needed a bit more structure: “there were times when the sort of free form flow of the class sometimes didn’t seem as organized or pointed or driven.” *Course Sequence* differs from *Course Structure* in that this code specifically captures students’ reactions to the course content introduced in the first few weeks of the semester followed by the development of the game later on. As Nick observed, “the ARG itself didn’t come ‘til the end. It almost kind of feels like an afterthought.” Michael, a student in the Interactive Simulation and Game Technology (ISGT) program, asserted that “game development should always start with as much time as possible cause you’ll work through a concept for months. It’s hard to get people to agree on one thing in just a couple months and then get a final product done just from that.”

In the *Game Scenario* code were comments such as Karen's, "So it [the ARG design project] has kept me engaged. …to me, it's much more interesting than just writ[ing] a paper or read[ing] a chapter." While Karen and others found it engaging, Nick had some difficulty with it. He stated, "specific to the ARG...one of things that was frustrating to me was that it was a combination of individual work and group work, but they never, at least for me, they never came together." Nick later admitted that he saw the *Connections Among Tasks*, another code in this category, but that they seemed "superficial" because development of the ARG was given short shrift by the sequence of activities in the course. This perception is explored more fully in the ***Results*** theme. For others, the *Connections Among Tasks* were more transparent. As Les reported, "after they [instructors] kind of talked about it a little I kind of got the idea of how this was going to work. And with that we just kind of took the time to, um, you know, put the pieces together."

Instructors/Learning Environment

Student reactions to the instructors and the learning environment fostered by them is the second largest category, accounting for 16.3% of the text in this theme. Over half of the text in this category was assigned to the code, *Positive Energy/Encouragement* from the instructors (See Table 5.4). As Les describes it, "it was always positive energy…always positive. So it really encouraged everybody to really get involved." Karen adds, "I felt it was like a safe learning environment in that I didn't feel any sort of superiority kind of attitude or things like that from the instructors. So I felt that they were interested in what I could

learn, making sure that I did learn." The *Open-ness of the Course* was also a strong code in this category. Kevin "liked the openness of it," and Michael felt "the openness of the way it is, really is a good way to learn." The *Professional Atmosphere* code captures comments such as this one by Les: "It is a classroom. We know how to act and stuff. But it's been very open, well, professional."

Table 5.4

Codes in Instructors/Learning Environment Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Positive Energy/Encouragement	14	1736	52.92	8.62	1.06
Open-ness of Course	8	922	29.15	4.76	0.59
Professional Atmosphere	5	558	17.93	2.93	0.36
3	**27**	**3216**	**100.00**	**16.31**	**2.02**

Overall Reaction

This category accounts for 12.5% of the data in the ***Reaction*** theme, and contains three codes documenting students' overall reaction to the course: *Enjoyable/Fun*, *Frustrating*, and *Engaging/Challenging*. Data describing the composition of each code within the category is presented in Table 5.5. The *Enjoyable/Fun* code captures a little over half of the text in this category. Example passages from this code include the following:

Michael: "I did like the class. It was enjoyable."

Les: "So, actually, I wanted more of it. I enjoyed it. I did enjoy it."

Nick: "It was fun," and "I enjoyed certain aspects of it."

Adam: “It has been a very good learning experience.”

The code, *Frustrating*, contained fewer passages and characters, but was characterized by statements, such as “The class was fun and frustrating” and “I don’t like open-ended things, so that’s frustrating. Whether it has anything to do with this class or not in particular.” Kevin found that “it was hard to keep track of everything we needed to do.” Statements coded as *Engaging/Challenging* include Karen’s descriptors of the course as “definitely more engaging” than other courses, “very thought provoking and…very challenging.”

Table 5.5

Codes in Overall Reaction Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Enjoyable/Fun	13	951	51.13	6.43	0.82
Frustrating	7	562	28.85	3.58	0.46
Engaging/Challenging	5	379	20.02	2.50	0.32
3	**25**	**1892**	**100.00**	**12.52**	**1.60**

Technology

The **Technology** category contains three codes for student reactions to the use of technology in the course (see Table 5.6). Overall, this category accounts for under 11% of the ***Reaction*** theme, but documents mostly favorable reactions to technology for learning. In the Usefulness code, Les reflects, “we did use a lot of these projectors that were fantastic. We were able to illus[trate]…I mean, we’ve got 3 screens everywhere. It’s great.” Adam concurs, ”I love technology and I think it’s cool that classes are starting to get to use technology

more." Most of the students were familiar and comfortable with using technology. The most indicative passage in the *Comfort/Familiarity* code is Kevin's assertion that technology is "how I think, so I like using the technology." Nevertheless, the two passages coded as *Too Many Technologies* came from Kevin. "With the different technologies, I think we were being introduced to so much, so many different types of communication over the Internet that it was hard for us to figure out which one everyone else was using." However, it seems that his reaction has less to do with technology itself, and more to do with connecting and communicating with others when there were too many venues for doing so.

Table 5.6

Codes in Technology Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Usefulness	10	1918	70.94	7.77	0.93
Comfort/familiarity	4	156	15.73	1.65	0.22
Too many technologies	2	342	13.33	1.45	0.18
3	**16**	**2416**	**100.00**	**10.88**	**1.32**

Prior Experience

Four codes underpin this category, which comprises 10.25% of this theme. Student experience in *Other Classes*, the code which dominates this category, contains comments such as "Well, other classes are kind of in the same classical setting. Where the professor talks and you just kind of do essays and such." Two students talked about their *Preconceptions About the Course*. Les stated, "I already came into it knowing that we would make this alternate

reality game, but I wasn't really sure what it was about." Another student said, "I kind of imagined taking a class that I was going to be participating in an ARG while I was actually designing an ARG, so that we were, you know, like learning something about making an ARG while we were sort of playing one." The *Technology* code captures students' prior experiences with technology, as opposed to their experiences with it in this course. Karen reported to have had "some knowledge of technology, but not a lot," while Kevin stated that "Almost all my classes have a computer in front of me." The fourth code in this category contains statements about students' prior *Life Experiences*. For example, Karen stated that she "felt comfortable with that [exploring other cultures] already because I have a…I love to travel."

Table 5.7

Codes in Prior Experience Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Other Classes	6	914	40.28	4.10	0.50
Preconceptions About Course	4	659	28.08	2.85	0.34
Technology	5	296	22.04	2.31	0.30
Life Experiences	2	150	9.60	1.00	0.13
	4	**17**	**2019**	**100.00**	**10.25**	**1.27**

Hybrid/ALCE

This course was a six-credit hour, learning community course (ALCE) that met three hours each week accompanied by three hours of online work each week. While these features did influence *this* instructional design, the researchers coded student reactions to them as a separate category in order to

more fully capture and isolate students' reactions to each. The **Instructional Design** category pertains specifically to the problem-based instructional methods, the developing an ARG course scenario, and the sequence of activities. Those *design* components differ from what are essentially *delivery* components in this category. For the most part, students did not react favorably to the hybrid delivery mode as captured by the code *F2F* (face to face) *Once Per Week*. As Les expresses it, "I think it would have done better if it…met twice a week instead of the one, because it didn't give you a whole lot of time for face time" which is discussed more fully in the ***Results*** theme. They generally responded favorably that it was a *6-hour Course*. Kevin affirms that "it doesn't hurt that it's 6 credits or multiple classes" Students also liked that it was *Multi-disciplinary*. Les observed that "you cover a lot more subjects that a lot of other classes covered and they kind of reinforce your learning from those classes and…kind of add more to it."

Table 5.8

Codes in Hybrid/ALCE Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
F2F Once/Week	8	1428	63.11	5.96	0.72
6-hr Course	3	356	19.60	1.81	0.22
Multi-disciplinary	2	424	17.29	1.65	0.20
3	**13**	**2208**	**100.00**	**9.42**	**1.14**

Peers/Students

The least significant category in this theme in terms of quantifiable weight, the **Peers/Students** category represents only 7.76% of this theme and less than 1% of the total text. However, that weight is misleading in that students highly valued learning from each other through collaborative projects. Those reactions are documented in other categories and themes. What this category uniquely captures are the types of relationships that students developed from those instructional activities. For example, the *Working Relationships* code includes Michael's recognition that "having to network with people really becomes important in that class, especially when we started working on that final game project that we are doing." Related to that code, however, Nick expresses *Frustrations*, "I guess my other experience with everybody else in the class has been mostly negative, I guess. [laughs] Um, I don't know, I haven't really been able to develop much of a working relationship with 'em." Despite this frustration, however, even Nick developed a close friendship with Karen. The other students did, as well. As Les describes it, "We've kind of developed friendships…these friendship type of relationships."

Table 5.9

Codes in Peers/Students Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Working Relationships	7	930	57.70	4.46	0.55
Frustrations	3	365	23.62	1.83	0.23
Friendship	3	216	18.69	1.48	0.19
	3	**13**	**1511**	**100.00**	**7.76**	**0.96**

Learning Theme

The ***Learning*** theme represents the largest segment of the total text, 37.31%. This theme includes seven categories comprised of 42 unique codes, and 406 passages made up of 76,332 characters of text. The categories and codes in this theme reveal students' perceptions of *how* learning occurred in the GVP, whether it was through presentation of content by instructors, the use of technology, or through the central problem scenario, designing an ARG. This theme also identifies what motivated students to learn, what learning preferences students possessed, and what role knowledge gained prior to this course played in students' learning. Figure 5.3 below shows the P/C mean percentage of each category within this theme. Table 5.2, presented previously in this chapter, displays the P/C mean percentages of the total text.

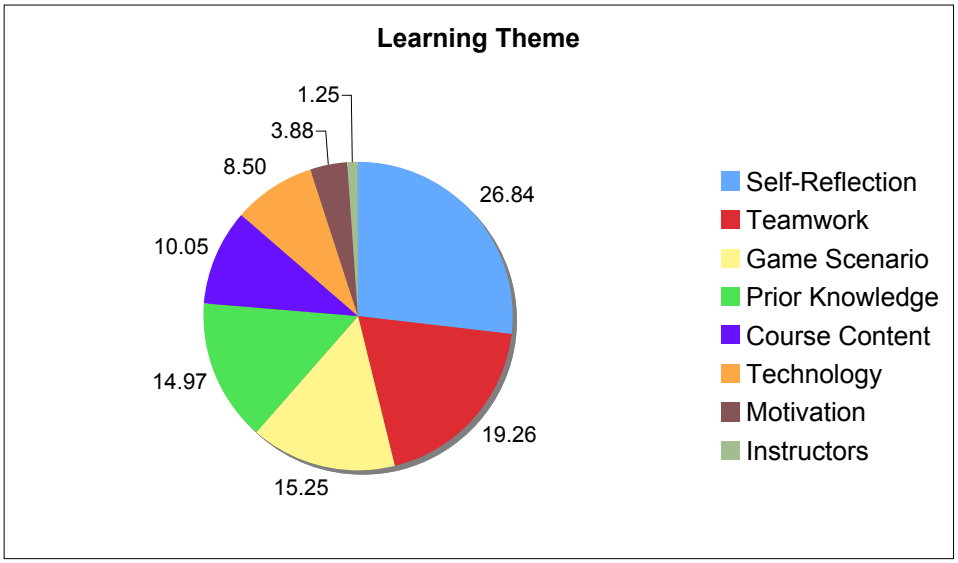

Figure 5.3. P/C mean percentage of text in Learning theme by category.

Of the eight categories, **Self-Reflection** was by far the largest, representing almost 27% of the text in this theme. Indeed, **Self-Reflection** is the largest category in the entire text (10.02% of total text), comprising almost as much text as the whole ***Reaction*** theme (12.27%). **Teamwork** was also a strong category in this theme. While it represents fewer characters of text than the **Game Scenario** (12,669 and 13,132 respectively), it had far more occurrences in the text (89 and 54 respectively) giving **Teamwork** a higher P/C mean weight (7.17% of total text) than student references to the **Game Scenario** (5.70%). **Prior Knowledge** weighed in very closely behind the **Game Scenario** category. In fact, it seems from these figures to have been more important than the **Course Content**, a finding that I consider a success of the design for reasons that I will discuss later. The data suggests that **Technology**, **Motivation**, and **Instructors** played a less significant role in this theme with a combined weight (13.63) less than that of **Prior Knowledge** alone.

Self-Reflection

Generally speaking, this category captures how students feel they learn. Of course, this whole theme aims to capture that construct, but at the theme level, the goal is also to determine what aspects of the design best facilitated students' learning. The text and codes in this category focus on students' self-reflections about how they like to learn, as well as what internal and external factors promote or hinder their learning. Table 5.10 details the codes for this category along with their theme and text weights.

Table 5.10

Codes in Self-Reflection Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Peer Interaction	27	3519	21.05	5.63	2.09
Personal Interests/Values	19	3835	18.07	4.85	1.81
Self-Awareness	18	3084	15.80	4.24	1.58
Self-Regulation	11	4260	15.35	4.15	1.56
Learning Preferences	17	2774	14.59	3.91	1.46
Self-Evaluation/Assessment	11	3055	12.46	3.36	1.26
Inst-Student Interaction	4	332	2.66	0.71	0.26
7	**107**	**20859**	**100.00**	**26.84**	**10.02**

Peer Interaction was the strongest code in this category. Despite frustrations with working in teams, most of students in the GVP prefer learning from peers to learning from instructors. As Michael expresses it, “discussion helps you develop your own opinion as well as learn from the others. And you don’t learn so much from what just the teacher is teaching you. You learn from your fellow classmates.” Les also felt he learned better from peers, noting “we just kind of learned from each others’ experiences, and at the same time we just understood the subject better.” Nick liked learning from peers more than listening to instructors; however, he preferred one-on-one conversations. He confesses, “if there’s more than one person that I’m talking to, I get frazzled easily. I have a tendency to clam up.” As the data above shows, *Instructor-Student Interaction* was not nearly as important to students as the *Peer Interaction* fostered by the learning environment the instructors facilitated.

Students' *Personal Interests* also played a strong role in their learning. Karen enjoyed the multi-disciplinary nature of the course, "because maybe there's one area that I'm more interested in than others, so it hasn't been a whole semester devoted to something I'm not interested in." The *Self-Awareness* code captures students' identification of psychological and in some cases, demographic attributes that had an effect on their learning. For example, Michael mused, "I realize that I'm sometimes too much of a passive person." For Karen, "One frame of reference is that I am the eldest person in the class." *Self-Regulation* was also a strong code. As Les reflects, "I try to manage, like, where I can talk and where I shouldn't, 'cause you know, if I don't have credibility on the subject what good does that do me?" Karen's comment, "I do feel like I can self-teach a lot of things," fell into this code as well. Nick acknowledges that he has "kind of a limited patience. [He] like[s] to work on things at [his] pace, whether that's fast or slow depends on the project."

Learning Preferences was somewhat of a "catch-all" code. It included Kevin's assertion, "I'm not one of those people that do very well with online classes. I like using the technology too. But I would rather have that as a supplement instead of half the class." Les's statement, "My preference is sort of talking about it and having some sort of visual representation," was included in this code as well. Although not as strong as *Self-Awareness*, the *Self-Evaluation* code was still significant. Text in this code depicts students' recognition of strengths or weaknesses in their abilities. Nick, for example, avers, "I have a

tendency to, uh, at least to analyze what I do, and try not to make, you know, rationalizations in order to justify poor reasoning. Sometimes it's easier than others." When asked what he learned about his ability to make aesthetic judgments, Adam stated that he preferred the objectivity of science and admitted, "I don't make aesthetic judgments that often because it's hard for me to really pin down what I find as beauty."

Teamwork

The six codes in the **Teamwork** category depict not students' reactions to working in teams, but their perceptions of how it impacted their learning. Table 5.11 shows weights of the codes in this category. *Participation/Roles* was the most heavily weighted code in this category. According to Kevin, this involved "finding that niche that everyone has and trying to work that out. That's another thing with the organization of the group, trying to find everyone's strength." At times, participation didn't occur as needed. Nick encountered this problem: "I had a project with another fellow in the class, [laughs] mainly he was absent so I ended up doing the project primarily on my own."

Michael summed up the *Communication/Discussion* code when he observed, "we have one person who has a very affirmative personality about what he wants and what he thinks. We have another person who is the complete opposite view but is also very affirmative about what she thinks." Karen, who missed class for two weeks to travel abroad, regretted that she and her project

partner “had agreed before [she] left to communicate in a certain way and that didn’t happen.”

Table 5.11

Codes in Teamwork Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Participation/Roles	24	3375	26.80	5.17	1.92
Communication/Discussion	22	3226	25.09	4.82	1.80
Strategies/Processes	14	2262	16.79	3.21	1.19
Frustrations	14	1495	13.77	2.70	1.00
Common Interests/Goals	11	1242	11.08	2.17	0.81
Interdependence	4	1069	6.47	1.19	0.45
6	**89**	**12669**	**100.00**	**19.26**	**7.17**

Nevertheless, students developed some new *Strategies/Processes* to deal with collaborative work. According to Michael, “when I usually work for the team, I thought ‘I work on my part, you work on your part, and then we come together at the end.’ It didn’t really work that well in certain situations, and this class was one of those certain situations.” Students found that they needed strategies for working together throughout the collaborative process. Indeed, one of the principal *Frustrations* reported by students was working independently on group projects. As Karen expresses it, “I have been frustrated when I’m working on my own to do my own work that I’m supposed to bring back.” Kevin puts this *Frustration* a little differently saying that “having a project that you’re the only one working on, or having a project that no one can agree on how to do, so nothing gets done.”

These frustrations seemed to be mitigated when students found *Common Interests/Goals*. As Nick puts it, “I feel like Karen and I worked, and still do, work well together. I feel that we both have the same sort of goals.” *Interdependence* was also a mitigating factor for some. Although Les talked about *Interdependence* at length, Nick states it more succinctly, “with the group projects, it was always important to me to, in fact it was more important to me actually, to participate or to have more participation and to put more effort into group projects than it was individual projects.”

Game Scenario

Obviously, collaborative teamwork was a substantial part of student work on the central problem scenario for the course--developing an ARG, the **Game Scenario** that labels this category. While **Teamwork** is a separate category in this theme, it was an integral part of what we are referring to as the **Game Scenario**. The codes in this category illustrate the impact that this overarching design component had on their learning. Some of the codes seem to indicate *what* they learned rather than *how* they learned. However, these codes do not capture *what* or *how much* students learned, but rather what they attribute to having learned from engaging in the development of an ARG aimed at impacting the UN MDGs. Table 5.12 shows the codes in this category and their respective weights.

Table 5.12

Codes in Game Scenario Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Applying & Integrating Knowledge	26	6122	47.38	7.21	2.70
Developing Narrative/Art	9	2646	18.41	2.84	1.06
Health Issues	7	2142	14.64	2.27	0.85
Global Awareness	6	940	9.13	1.35	0.50
Self-Efficacy	3	592	5.03	0.76	0.28
UN MDGs	2	379	3.29	0.49	0.18
Environmental Issues	1	311	2.11	0.33	0.12
	7	**54**	**13132**	**100.00**	**15.25**	**5.70**

Applying & Integrating Knowledge was by far the strongest code, representing nearly half of the text in this category (47.38%). To a certain extent, the multi-disciplinary nature of the course compels learners to integrate knowledge, but text in this code specifically attributes this cognitive task to the **Game Scenario**. For example, Kevin declares, “we definitely had to do it for the ARG…because you have to have the lit--the writing and literature--and then the technology aspect and integrate them…with different people.” They drew from more than just the course content, as well. As Adam points out, “you know, all of us come from different family backgrounds and all that stuff and we’re all teaming up together to make this one game, and we’re pulling ideas and locations from different parts of the world.”

Developing Narrative/Art for the game was another application of knowledge and skills that they attributed to the **Game Scenario**. For Les, it was crucial to the effectiveness of the game narrative that they rectify “gaps between the story and come up with something that would be reasonable and logical, in a

series of…in a timeline." Nick shared Les's concern about both narrative and art, wondering, "Is it going to look good?" and "worrying about how its going to come together, worried that's its not going to be, you know, cogent…or coherent."

Ironically and delightfully, *Health Issues* is a fairly strong code in this category. One of the core perspectives regards the importance of maintaining health and wellness. When asked what they learned about that, students generally replied that it wasn't covered in this class. Yet because the game scenario was coupled with the MDGs, a few of which address issues of global health, students learned a remarkable number things about *Health Issues*. For example, Les explains, "since we were going to do sort of the Four Horsemen of the Apocalypse that kind of says a little bit of it. 'Hey, you should probably eat well and kind of avoid all of these toxic materials that are, that may be in your food'." Les refers here to the Four Horsemen (an application of archetypes and symbols which they studied earlier in the semester), which framed the levels of the game they designed. It was student research on famine (one of the Horsemen/game levels) that led to extensive discussions of toxic preservatives and genetically modified organisms (GMOs) in food production.

Global Awareness was also a fairly significant code although surprisingly not as strong as *Health Issues*. Again, students attributed this learning to what they explored while developing the game. According to Kevin, "I think in just these past few weeks that we've learned more about what we are because of the ARG…about us as a whole and how our contributions make a bigger difference."

Karen confirms this, “I feel much more connected to the world as whole. I’ve researched some things that I had not researched before or spent time looking into, so I feel like more of an actual global citizen than I did before.” The remaining codes, while interesting and directly attributable to the development of the game, did not represent a substantial portion of the category or the overall text.

Prior Knowledge

From a design standpoint, the strength of the **Prior Knowledge** category illustrates a vital component of the GVP as a capstone course. While the instructors of the course might not look favorably on *Other Classes* (a code within this category) carrying a heavier text weight than the content of this course, it doesn’t actually do so. This category encompasses **Prior Knowledge** from *Life Experience*, as well as *Reading/Media* that students engaged with outside of class. As Table 5.13 shows, the *Other Classes* code accounts for 3.28% of the text, slightly less than the **Course Content** category, a discussion of which follows this section. In a capstone, one expects students to draw upon prior knowledge from a variety of sources and experiences, bringing them to bear on the construction of new knowledge in the capstone. This also appeared to be the case with the GVP.

Table 5.13

Codes in Prior Knowledge Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Other Classes	37	6464	58.76	8.79	3.28
Prior Life Experience	18	3767	31.27	4.68	1.75
Reading/Media	5	1344	9.97	1.50	0.56
3	**60**	**11575**	**100.00**	**14.97**	**5.59**

Other Classes represents a larger portion of the category than other sources of prior knowledge. Adam talked about his pursuit of science, “I have always been into science and technology. I mean, heck, I’m going for an associates in science. I’ve taken…chem[istry] for instance, but, I think that science and technology…I’ve been able to apply them in my life.” Les recounted at length the impact that his Project Development class had on this course, but also affirmed that “any class or any experience kind of builds upon” prior knowledge. Statements in the *Life Experience* code include Michael’s revelation that he learned much from “just going through life dealing with everything I’ve had to deal with growing up,” and Les’s reflection, “my dad’s a civil engineer so I kind of grew up on, kind of knowing how schematics look.” In the *Reading/Media* code is Adam’s rather apologetic statement, “Well, this isn’t exactly related to the class, but I‘ve learned that after watching enough CNN and a lot of other news channels, I’ve learned a lot more about the politics of this country and obviously a little bit about the world.” Nick was well read, and often sought out books that weren’t assigned for class, but connected to something discussed in it. “I read on

a pretty broad sort of spectrum," says Nick. "I just picked up Edward O. Wilson's book, *Consilience*," which he talked about at length in the interview.

Course Content

The impact of the content and activities in the early part of the course was worthy of note, representing over 10% of this category and 3% of the text overall. What seems to have had the most influence, at least on the core perspectives about which students were explicitly asked, was their culture project. The *Other Cultures* code represents almost 40% of this category (see Table 5.14). The students seem to have learned much from this three-week project, which asked them to explore and then present to the class, significant works of literature, art, and architecture of another culture. Michael comments:

> I'd have to say a time when I was successful was when we were doing our cultural projects. Me and my partner were assigned the Southern Americas. That's not my greatest area of forte. I'm more of the European, the Asian, and the upper Americas. So I would have to say, I really had to come out on my own on that one and learn things I never even knew. Like, I didn't know that there were this many tribes in Brazil, or I didn't even know Brazil had a specific form of marshal arts that was all their own. I kinda of thought that was just a developed style from somewhere else, so that one project taught me a lot.

Adam shared similar perceptions, "Me and my partner, Nick, we decided to do the country Japan. I love the country Japan because I watch a lot of Anime and play a lot of video games that come from Japan, and so I thought 'Hey! It would be cool to learn about the history...and so basically we were looking up historical and cultural aspects of it."

The discussions and presentations on *Architecture/Art* led by the instructor early in the class also made a prominent impression. According to Les, “I remember the architectural thing being the thing I like the most and the explanation behind Gothic architecture and the reason why they were so tall and just the time period they were set in and the reason why they were...and the explanation behind gargoyles, and stuff like that.” Text in the *Multiple Disciplines* code is typified by another comment from Les: “This [class] kind of brought a lot of them together. Architecture and religion and all of this stuff kind of tied in together.”

Table 5.14

Codes in Course Content Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Other Cultures	13	3435	38.05	3.85	1.44
Architecture/Art	10	2536	28.63	2.89	1.08
Multiple Disciplines	6	831	13.06	1.28	0.48
Research/Documentation	3	766	8.62	0.87	0.33
Writing/Grammar	3	429	6.61	0.65	0.24
Archetypes/Symbols	1	233	2.74	0.28	0.10
Literature	1	157	2.29	0.23	0.08
7	**37**	**8387**	**100.00**	**10.05**	**3.76**

Technology

Students’ *reactions* to technology were reported in the previous theme. In this category, codes represent *how they learned* with technology. Along the way, they acquired some new *Tools*, which was the largest segment of this category. According to Kevin, who is a technology guru, “Mary Jo definitely had a lot of

different resources that we used that I've never used before." Nick "thought about how we have used those sort of Web 2.0 tools…that's been fun." Students not only learned about new tools, they saw how they might *Apply/Use them in Other Contexts*. Karen discovered that she was "not too old to get involved and learn it [technology] and make it part of everyday life." Adam stated, "I'll use it [Powerpoint] in the future because it is a handy little tool." They also saw how technology afforded *Clearer Communication*. Les was thrilled that they "were able to use graphics and video and everything . . . and then we kind of talked about it. And used those to sort of illustrate our presentations better."

Adam argued that "if it's good technology and it's working correctly it can help make the learning easier." Technology also afforded *Active Involvement*. As Les puts it, "we would show something on the screen and maybe one of us had a reference to what we were talking about and we kind of just talked about it a little bit more." For them, it was "more active other than just having a plain old text, standard, Powerpoint presentation."

Table 5.15

Codes in Technology Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Tools	16	1985	38.06	3.27	1.22
Apply/Use in Other Contexts	9	1478	24.51	2.08	0.77
Clearer Communication	7	1294	20.30	1.71	0.64
Active Involvement/Interaction	6	1077	17.13	1.44	0.54
4	**38**	**5834**	**100.00**	**8.50**	**3.17**

Motivation

The **Motivation** category is relatively insubstantial with respect to the entire text and even this theme. Indeed, the researchers initially identified **Motivation** as a code within the **Self-Reflection** category, rather than a category itself. However, we soon discovered that students reported different sources of motivation and wanted to capture those differences, particularly with respect to the design of the course. Ultimately, if we had left **Motivation** as a code in **Self-Reflection** that category would represent 11.47% of the total text. Table 5.16 provides descriptive data of the codes in this category.

The data suggests that what most motivated students was the *Relevance* of the learning tasks and content to their immediate lives. Nick felt that "it's hard to motivate myself to do tasks that I don't see…I can only seem to see long term benefits for. If I don't have a short-term benefit, it's hard for me to uh, you know, aside from the pleasure of completion, it's hard for me to get involved in that." *Personal Interests/Goals* were also a motivation. For Nick those were fused the *Relevance or Connections to Life*. "I guess that was kind of fused with, uh, my interest in the task or my ability to get involved in the task." Les's "driving force is inspiration." If he is inspired by *Personal Interests*, he's motivated to *Do Well*. "And with that motivation, I'm able to go into other classes such as this one and when something get's assigned, say for a schematic or something for a military vehicle, I've done that before. So, I'm able to, say, take this assignment and

make it look nice because I've done that before. And I'll make it as best as I possibly can."

Table 5.16

Codes in Motivation Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Relevance/Connections to Life	5	937	31.78	1.23	0.46
Personal Interests/Goals	3	945	25.24	0.99	0.37
Grades	4	456	20.69	0.79	0.29
Doing Well	1	594	12.91	0.51	0.19
Reliability/Interdependence	2	168	9.38	0.36	0.13
5	**15**	**3100**	**100.00**	**3.88**	**1.45**

Instructors

As discussed earlier, students felt they learned more from each other than from the instructors. For them, the learning environment that the instructors created was highly important, in that it allowed them to learn better from their peers. Part of that role was *Focusing Discussions* to relevant learning topics. Les comments that despite the open-ness of the course, "I wouldn't say we sidetracked or anything. It was still on the same relevant topic." Karen found that a real time-saver, "because I haven't had to wade through other things. It has been very focused." Nick felt the *Support Outside of Class* to be particularly helpful. "I think the strongest guidance that I got was talking with Mary Jo in her room [office]. When I would have questions outside of class, then she was always available to talk to me for that. She helped me out quite a bit." Kevin's description of Trina's straightforward teaching style was also telling. "She just

kind of laid it out there, and I think I learned more from that than half a semester in a normal English class. ‘Cause it was just straightforward.”

Table 5.17

Codes in Instructors Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Support Outside of Class	2	289	35.29	0.44	0.16
Focusing Discussions	2	272	34.19	0.42	0.16
Straightforward Instruction	2	215	30.52	0.39	0.14
3	**6**	**776**	**100.00**	**1.25**	**0.46**

Transfer Theme

As explained earlier, the ***Transfer*** theme assembles evidence from student interviews that suggests that they have to some degree internalized the values, attitudes, and patterns of thinking that were the overarching goals of the design: the core perspectives and conceptual age thinking. The ***Transfer*** theme represents 21.23% of the total text. The theme includes five categories comprised of 26 codes and includes 210 passages made up of 47,227 characters of text. The categories and codes in this theme relate to patterns of thinking, as well as personal and socio-cultural values or responsibilities. Figure 5.4 below shows the P/C Mean Percentage of each category within this theme. Table 5.2, presented previously in this chapter, displays the P/C Mean Percentages in this theme in relation to the total text.

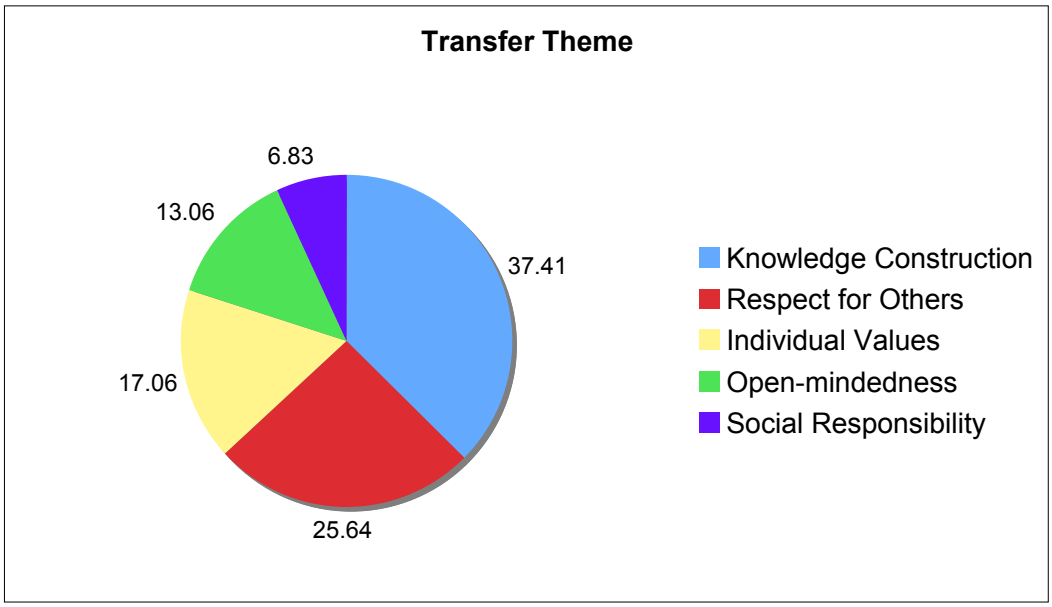

Figure 5.4. P/C mean percentage of text in Transfer theme by category.

The **Knowledge Construction** category represents the largest segment of this theme at 37.41%. a finding which is promising with respect to the goals of the design. Indeed, this category represents 7.9% of the total text, the third largest category in overall text. The **Respect for Others** category is also strongly represented at 25.64% of the theme and 5.43% of the text overall. **Individual Values** is the third largest category in the theme, followed by **Open-mindedness** and **Social Responsibility**.

Knowledge Construction

This category contains five codes that represent a sequence of thinking patterns indicative of building or constructing knowledge. The first is synthesizing existing knowledge, in this case coded as *Integrating Disciplines*, followed by

Making Connections to New Ideas, then *Applying to New Contexts* in order to *Create/Construct Something New*. A phase of this process that occurs throughout is evaluating new constructions; however, we have placed that code at the end of the sequence as it represents the highest level of cognitive skills. Table 5.18 shows each of these codes and their weights within the text, but I've chosen not to sort them by weight in order to preserve the sequence of the thinking pattern. *Integrating Disciplines*, the first category in the sequence, is the strongest code in the category. Although *Applying to New Contexts* has a slightly higher weight than the second code in the sequence, *Making Connections to New Ideas*, they differ only by a fraction of a percent. Likewise, *Evaluating Against Norms* is larger than *Creating/Constructing Something New* although the weight difference is more substantial than the difference between the two previous codes.

Table 5.18

Codes in Knowledge Construction Category

Code	Pass	Char	% of Cat	% of Theme	% of Text
Integrating Disciplines	21	5540	29.20	10.87	2.33
Making Connections to New Ideas	17	3612	21.05	7.87	1.67
Applying to New Contexts	18	3536	21.44	8.03	1.69
Creating/Constructing Something New	12	994	10.26	3.91	0.79
Evaluating Against Norms	14	3216	18.05	6.74	1.43
	5	**82**	**16898**	**100.00**	**37.41**	**7.90**

Before discussing each of these codes separately, the following passage from Les's interview is provided as an example of how one student proceeded through this sequence:

Integrating Disciplines	It was the background information with archetypes. We covered archetypes and storylines… a lot of those concepts come from other… from folklore, stories from different religions, different countries, and nations and so on.
Making Connections to New Ideas	So after that, we also had more projects that involved researching other cultures and with that you kind of learn how they believed in this and how history kind of led 'em to what they are today
Applying to New Contexts	and how you can use a lot of that information to understand how … what they believe in, what they don't like, kind of how they … interact with other societies
Creating/ Constructing Something New	and at the same time use a lot of those references or something. And kind of mix it together and make it a game.

He doesn't arrive at *Evaluating Against Norms* in the passage above, but does so in a later passage:

Self-Reflection	I'm more of an artist person and . . . I come from a background where I just kind of design,
Integrating Disciplines	and we've kind of used my own designs and art kind of things. And I've even textured a couple things, a couple units and such. And with that motivation,
Making Connections to New Ideas	I'm able to go into other classes such as this one and when something get's assigned, say for a schematic or something for a military vehicle, I've done that before.
Applying to New Contexts	So, I'm able to, say, take this assignment and make it look nice because I've don't that before.
Creating/ Constructing Something New	And I'll make it as best as I possibly can,
Evaluating Against Norms	show it to other people, and hey, if they like it, perfect. If they don't, if they want to suggest something, by all means I'll go ahead and fix it. . . And make it as best as I possibly can.

Of course, Les was not the only student who talked about *Integrating Disciplines*. Kevin's assertion, "We definitely had to do it [integrate scholarly disciplines] for the ARG," provided in the discussion of the *Applying & Integrating Knowledge* code in the **Game Scenario** category of the ***Learning Theme*** was also coded as *Integrating Disciplines* in this category and theme. In part, the strength of this code derives from the fact that students were specifically asked to tell about what they learned about "integrating knowledge and understanding the interrelationships of the scholarly disciplines," one of the core perspectives.

Adam's musings on this perspective also illustrate the degree to which students engaged in this type of thinking.

> Well, the integration of knowledge is important because depending on how you view something, you will figure out after awhile, or at least I have that, everything is interconnected to a degree. Because, for instance, all the branches of science, as just one random example, all come from mathematics. From mathematics, then you get, then you get physics. From physics, then you get chemistry. From chemistry, you get biochem[istry]. And you get biology, and then you get anatomy, and then it all breaks down from there.

Indeed, when asked about his ability to make aesthetic judgments, Adam initially demurred (as discussed in **Self-Reflection**), but then *Applied & Integrated Knowledge* from his background in science to an aesthetic depiction of the universe. "For instance, I've always found it kind of interesting that, depending on how you want to look at it, the string theory almost practically says that the universe is kind of a cosmic symphony."

Adam takes those thoughts a step further in comments subsequently coded as *Making Connections to New Ideas*. “Within science, you know, there’s kind of an artistry to things, like for instance, there is a mathematical equation, I want to say it’s E, no. I forget now. It’s like 5, the divine constant. Because like, it’s like the length of the spirals on a seashell—or something crazy like that-- I mean it’s everywhere. So you know, some people see beauty in that, and so that’s kind of an artsy kind of thing. So everything connects in its own interesting way.” Nick, the avid reader, made many connections to new ideas. As mentioned earlier, he talked at some length about the book, *Consilience*. A passage from that discussion fell into this code. “What *Consilience* or whatever, keeping that in mind, you’re able to see natural processes and social processes as part of big, interconnected, I don’t know, inextricable processes. Processes that are mutually inextricable. I mean, they’re all dependent. So I mean, I see a lot of worth in that.”

Students also talked about taking new ideas and *Applying [them] to New Contexts*, the development of the game, for example. As Karen puts it, “because of the research to develop it. I mean it’s just all tied into the research to be able to put all the pieces of that ARG together.” Les saw how the activities involved in developing the game applied to work outside of the academic realm. He expressed an appreciation for “the way that it prepares you to go into real life settings.”

What distinguishes *Applying to New Contexts* from the code, *Creating/Constructing Something New*, is that passages in the former discuss

how ideas or skills might apply while those in the latter more explicitly mention the generation of “something new,” be that a new idea, image, or even the game. As Kevin points out, each phase of the course, even the early weeks prior development of the game, involved the creation of new artifacts. “So you have to concentrate on different sections and combine them into whatever we’re doing, the proposals, the work that we did on the ARG.” While the previous passage denotes a more global perspective on the entire course, another passage in this code represents a more localized view. In this passage, Les talks about modifying images for the game so that they convey a specific message to the player: “take a photo and Photoshop a photo and kind of change a few things here and there and make it look like it was actually supposed to be, like it’s supposed to be related to the subject.” *Creating Something New* occurs in simply taking a photo, but it extends beyond that to modifying or “Photoshopping” it so that it might better fit within the larger creation: the game itself.

In that passage, Les exercised evaluative thinking as he discusses creating images. As mentioned earlier, *Evaluating Against Norms* occurs throughout the process of **Knowledge Construction**. Because of that, it was often difficult to separate text that might fall in this code from that which might belong to other codes in this category. To a certain extent, that is why the codes in this category were not ordered by rank. The weights in this category are not as telling as they are in other categories because much of the text could be coded in more than one way. Nevertheless, examples of students *Evaluating Against*

Norms are present. For example, Kevin recounts, “I built the website, so I had to kind of view other people’s judgments of what professionalism looks like and what certain sites look like to try to trick them into believing that these companies were someone else.” What he means by “someone else” is someone other than him or that “these companies” were *real*, rather than the fictitious constructions of students in a class. As discussed earlier in the code, *Developing Narrative/Art*, Nick worried about the coherence of the narrative, “the kind of, thematic flow,” which provides another example of *Evaluating Against Norms*. For him, the player experience was very important: “I just want it to be strong . . . I want the player, you know, to experience being strongly directed. Rather than…wondering what’s going to happen next…passively.”

Respect for Others

Of the six codes in the **Respect for Others** category, *Different Cultures* was the strongest, which correlates with the finding in the ***Learning*** theme that the *Other Cultures* code was a significant part of the **Course Content** category. The following passage from Les typifies passages in this code, “You really need to understand the history of the people and…kind of their background so you can respect their ideals and their beliefs and such.” The insights of Michael and Adam quoted earlier in the *Other Cultures* code for **Course Content** also fell in this category and code.

The *Opinions/Perspectives* code contains statements in which students express respect or appreciation for other people’s opinions. Kevin reflects that

the course made him, “a little more aware, more accepting, I guess. Just listening to people. I’ve been fairly good at that, but sometimes there [are] certain topics that I tend to shut down on because there’s no way I’m going to change my view on it. But I learned a bit more to at least listen and understand their point of view so I can understand them more.”

The *Social Negotiation/Consensus* code contains passages in which students express an understanding of the process of social negotiation toward building of consensus. As Karen expresses it, “the downside to [working collaboratively)], is if you have very oppositional opinions, and for whatever reasons have trouble reaching a compromise. And so that, you know, is gonna’ happen everywhere. And that’s part of learning to work things out with another person.” Karen’s statement about social negotiation actually followed one in which she expresses the *Value of Collaboration*. “I think the biggest benefit of collaboration is just other thoughts. I mean just the, you know, everybody comes from a different place. And so to have more than one set of ideas.” This code is not about students liking or disliking collaborative work, it’s about their seeing the value in it, whether they like it or not. Nick did not like collaborative work, but he did recognize the value of it: “I mean, you know, I recognize group work is important to both the scholarly disciplines and like the general marketplace…but I just personally hate it.”

Differing from a respect for the *Opinions/Perspectives* of others, *Strengths/Talents/Goals* codes statements regarding the respect of these

qualities in others. As Les puts it, “this in itself, to understand what everybody, the other students, what they do better and then use those assets to you know, give ‘em a certain job.” Kyle expresses this respect similarly, “a lot of times you just have to find out what people are good at. Because sometimes they don’t really know themselves until they start trying things.” In addition to a respect for *Other Cultures*, students expressed respect for *Differences Within [their own] Culture*. Karen expressed it regarding age differences, “Actually, it reminds me, again, because these…my classmates are my kids ages…and even though I respect my adult children, it reminds me of being that age and how much I did have to offer. So, it just kind of brings back to mind that, yes, you really have to listen, to even young adults because they do know things that I don’t know.” Other passages in this code relate to differences in personality, religion, and gender.

Table 5.19

Codes in Respect for Others Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Different Cultures	13	3051	24.69	6.33	1.35
Opinions/Perspectives	11	2346	19.90	5.10	1.08
Social Negotiation/Consensus	10	2095	17.93	4.60	0.97
Value of Collaboration	8	1724	14.55	3.73	0.79
Strengths/Talents/Goals	8	1182	12.26	3.16	0.66
Differences w/i Culture	5	1453	10.68	2.73	0.59
6	**55**	**11851**	**100.00**	**25.64**	**5.43**

Individual/Personal Values

This category contains seven codes representing individual or personal values, as opposed to values or thinking patterns associated with relating to others. The strongest code in this category deals with the importance of *Exercising Judgment or Being Informed* rather than blindly accepting things at face value. It includes statements such as this one made by Karen, “I have way too much trust in what is at the WalMart and the Tom Thumb and, you know, so I’ve been made very aware.” Similarly, Adam finds that “it’s very important to know what is going on in the world because otherwise, you know, you don’t know what you need to look out for.” Statements conveying the importance of a *Work Ethic* made up the second largest code in this category. Les expresses it this way, “Oooh. Well. You’ve gotta push yourself always.” A comment made by Michael in this code was his response to the question related to the importance of integrating the scholarly disciplines. “Well, I’ve learned that discipline on the scholarly level is very essential when it comes to getting a lot of work done on this level done. When in high school people hold your hand. And in middle school people really hold your hand. And in elementary school people get paid to hold your hand. But in college, you’re on your own.” For him, “scholarly discipline” meant self-discipline.

The code *Creativity/Self-Expression/Emotion* is another rather accretive code label. Interestingly, many of the passages in this code were given in

response to the question about using logical reasoning in problem solving. Take the following dialogue between Karen and her interviewer, for example:

> Karen: I think something can be emotion driven and that's been some of our discussions back and forth.
>
> Interviewer: OK. So you would tend to depend more on your instincts…
>
> Karen: yes.
>
> Interviewer: …and emotions than a logical decision?
>
> Karen: Yes.
>
> Interviewer: OK.
>
> Karen: Yeah. Especially for creative things.

Michael responded to this question thus, "In this class I've learned that logic really doesn't help except when you are doing that which is illogical. Art, writing, a lot of these things are illogical. That's just my personal view, but for writing, writing is the expression of the writer. It is not meant to be logical to everyone." Only two passages were coded as *Logic/Rationalization*. Nick's statement, "I wouldn't say I'm always logical. But I have a tendency at least to analyze what I do, and try not to make uh, you know, rationalizations in order to justify poor reasoning," quoted earlier in the ***Learning*** theme as an example of *Self-Evaluation* also fit here in this category.

An appreciation for *Wholeness*, balancing mind, body, and spirit, was another fairly strong code. For Karen, this involved balancing logic and emotion. She feels that her experience in the course "has reinforced that I come from an

emotional place [laughs] rather than a logical place, which I'm sure my classmates would agree with, but that makes for good … I think you need that balance." For Michael, this related to self-discipline, as well. "I personally think of wellness as a serene state of being. Others may not view it that way, but that is the way I view it. So, my wellness learning . . . I'd have to say, is just getting everything together, not putting things off until the end. Keeping things organized really helps to improve your wellness." While not as strong a code, *Reliability/Responsibility* contained passages related to being a reliable member of a team. As Nick expresses it, "I'm a lot more dependable if I'm afraid I'm going to disappoint somebody, in a way that I'm afraid it's going to hurt them in some way."

Table 5.20

Codes in Individual/Personal Values Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Exercising Judgment/Being Informed	8	2192	24.90	4.23	0.91
Work Ethic	3	2351	17.70	3.20	0.72
Creativity/Self-Expression/Emotion	6	1254	16.54	2.76	0.58
Wholeness	4	1528	14.81	2.57	0.56
Reliability/Responsibility	4	889	11.32	1.89	0.40
Honesty/Avoiding Plagiarism	4	624	9.87	1.61	0.34
Logic/Rationalization	2	300	4.87	0.79	0.16
7	**31**	**9138**	**100.00**	**17.06**	**3.67**

Open-mindedness

This category represents unique codes that differ from those in the previous three categories. **Knowledge Construction** deals specifically with

thinking patterns showing a progression through the process of constructing knowledge. To an extent, **Open-Mindedness** is part of that process, but it's more of an attitude or value than a progressive pattern of thinking. It must be present for knowledge construction to occur, but differs from it, as well. In some ways, **Open-mindedness** is an **Individual/Personal Value**; however, it also deals in subtle ways with relationships outside of the individual. Notwithstanding, it is not the same as **Respect for Others**, be that their opinions, cultural background, or strengths. This category is more about being open to new *ideas* rather than people, including technologies, works of artistic expression, and even re-constructions of previously held knowledge constructs. Table 5.21 details the codes in this category.

Table 5.21

Codes in Open-mindedness Category

Code		Pass	Char	% of Category	% of Theme	% of Total Text
Technologies		9	2232	34.50	4.51	0.96
New Ideas/Perspectives		9	1519	29.01	3.75	0.78
Reevaluating Old Ideas		5	2047	25.38	3.36	0.73
Aesthetic Appreciation		**3**	693	11.11	1.45	0.31
	4	**26**	**6491**	**100.00**	**13.06**	**2.79**

The *Technologies* code captures passages expressing an appreciation for or open-ness to new technologies. According to Adam, "without science there is no technology cause, those are what give you the formulas and other things that you need to learn how to build it…and so I think that I've gotten truly an appreciation of just how useful all that is because we're using a lot of

technology—you know we're using computers, we're using Websites—all that stuff to put our game together which couldn't have been done even 20 years ago." The *New Ideas/Perspectives* code is represented by passages such as this one from Michael, "It's really hard to be just one thing and not open yourself up to other things, 'cause you feel limited. Your view is very limited. You don't get to experience a lot of new things."

The *Re-evaluating Old Ideas* code doesn't contain very many passages, but contains much more text than *New Ideas/Perspectives*. Responses in this code include reflections such as this one made by Nick:

> Oh, earlier when we were talking about Wooten Hall, I guess I called it a big ugly box. Uh, we talked about some architecture and I know that's actually a style [laughs]. I happen to, you know, NOT like it very much, but uh, but it's a style, it represents something, it's not just a cheap efficiency. So, I get it in that way. It'd been really easy, you know, for me to just call buildings like that big ugly boxes without recognizing that the architects, builders had, I guess values that they were both using and showing by building it. Or designing it.

While Nick is talking about the architecture and aesthetic judgments, his comment was coded as *Re-Evaluating Old Ideas* because he is doing just that. Much of what was presented to students on art and architecture challenged their pre-existing notions that art is simply a matter of personal taste. Thus when asked about their ability to make aesthetic judgments, most responded that they don't make them well. In the *Aesthetic Appreciation* code, for example, Adam states, "I don't make aesthetic judgments that often because it's hard for me to really pin down what I find as beauty…but I felt for instance that some of the architecture we were looking at was rather interesting. So I mean I guess it has

helped me a little bit with figuring out, you know, with expanding my capacity to make those judgments, but like I said I don't do it very often." I wonder if their claims about their capacity to make aesthetic judgments would have been more strongly stated prior to our lengthy discussion of it. Nevertheless, these responses are a strong indication that previous conceptions about art and beauty were perturbed by discussions in the GVP, and that casually dismissing something as "ugly" rejects a wealth of ideas along with it. Their humble comments about their abilities to make aesthetic judgments reflect an open-mindedness to the ideas represented in objects of art that go deeper than pretty vs. ugly.

Social Responsibility

This category contains four codes related to **Social Responsibility**. One of the interview questions asked students to tell what they learned about themselves in relation to the larger society and world in which they lived. The *Self in Society* code contains mostly responses to that question, although not every response to that question fell into this code. Some may have fallen into **Respect for Others**. Nevertheless, as Karen expressed it, "I feel much more connected to the world as whole. So I feel like more of an actual global citizen than I did before." And Les reflected that "it really makes me realize that not everybody has this opportunity as we have." Kevin's response was, "I think understanding how small we are. And that kind of puts it in more of a perspective for me."

Despite an understanding of the relative "smallness of self" in relation to society and world, the *Need for Action* or responsibility to take action was also present. Karen found herself "reminded that it's very easy to just focus on yourself and your family. And I have my own children and grandchildren and I can't stop there. Even if it's not a huge impact, I can make a small impact on the rest of the world." Kevin concurs that even though we are individually small, "our contributions make a bigger difference." For one student, social responsibility was to *Do No Harm*, which the researchers felt was different than taking action and thus coded it separately. Adam puts it this way, "I will quote what I learned in my ethics class to be the agreed upon universal ethical principal and that is basically, do not do anything that harms others or you know, restricts their ability to do something that they want to do." Overall the code *Protecting Planet* was quite small, but characterized by statements such as this one: "we also have a responsibility to make sure that we protect the planet 'cause everyone uses it."

Table 5.22

Codes in Social Responsibility Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Self in Society	10	1490	57.40	3.96	0.82
Need for Action	3	588	19.69	1.34	0.28
Protecting Planet	2	348	12.36	0.84	0.18
Do No Harm	1	423	10.55	0.69	0.15
4	**16**	**2849**	**100.00**	**6.83**	**1.43**

Results Theme

The ***Results*** theme examines what worked well and what did not, the tensions and successes that occurred in this semester-long implementation. The **Instructional Methods** category comprises the largest percentage of this theme, with **Students** and **Curriculum & Assessment** representing the second and third most important categories. Figure 5.5 shows the weights of each category within this theme.

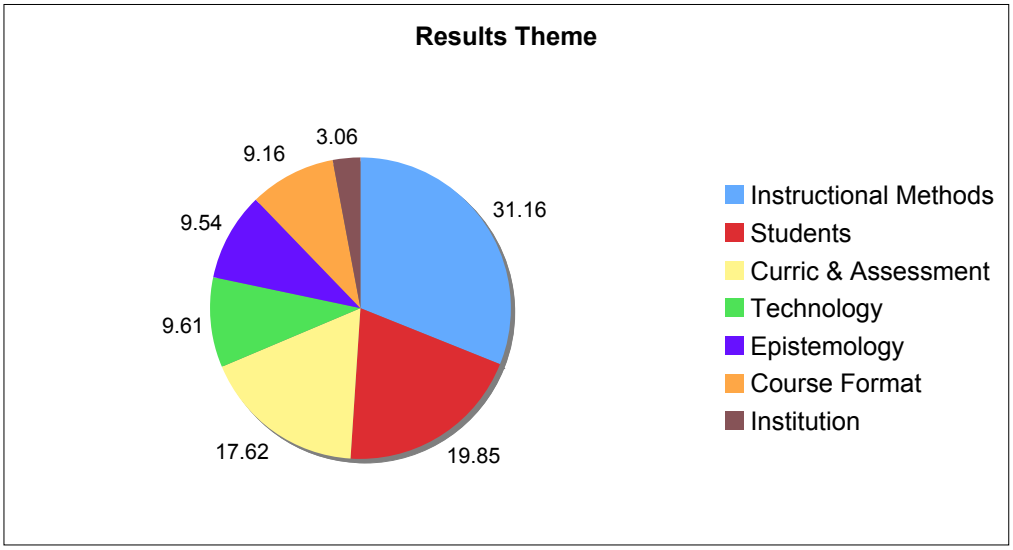

Figure 5.5. P/C mean percentage of text in Results theme by category.

In relation to the entire text, this theme is the second largest of the four themes, representing almost a third (29.19%). However, this is the only theme that included data from the instructor interviews, which did have an impact on its weight within the overall study.

Instructional Methods: Tensions

The code *Sequence/Time to Design ARG* was the strongest tension in the **Instructional Methods** category. Others concurred, but as Michael puts it, "Personally, I would have to say there's only one thing I would change about the curriculum for this class, just because I'm also going into game design and I know the effort it takes to just design a game. It can take years to design games. When the game is thrown right at the end, and we also have all this other stuff that we also needed to take care of that really does kind of throw it off." Although this was not as strong a code, the *Time Necessary for Consensus* seems to be the underlying cause for the need for more time to design. According to Michael, "Game development should always start with as much time as possible cause you'll work through a concept for months. It's hard to get people to agree on one thing in just a couple months and then get a final product done just from that. Because everyone does have different views and if you expand it out to an entire semester, it allows for more development." Kevin, comparing the GVP to his experiences in his Project Development class in the ISGT program, observes "in the other class we had the entire semester, which is still not very long, but you can take two weeks to argue about everything, get it out of everyone's system, and when that's done you have the rest of the semester to work on, toward your goal."

The tension between *Guided vs. Directed Instruction* was the second strongest code in the **Tensions** part of this category. Nick felt that he "require[d]

more direction than most people do," adding much later that "there were times when the sort of free form flow of the class sometimes didn't seem as organized or pointed or driven." The ill-structured nature of a problem-based environment often causes this sort of cognitive conflict in students who are accustomed to directed instruction. Both Nick and Kevin thought this intentional aspect of the design was a lack organization on the part of the instructors. Kevin postulates, "I figured since it was the first class, it was a little--I don't want to say disorganized--it was just learning as we went on how we would do things." That emergent quality can be perturbing to students. Indeed, Kevin also notes, "Well, I think, it was more structured in the very beginning. We kind of knew what we needed to have done." Then he adds later that he "didn't like it as much towards the end, because it was less discussion based." While he perceived the later part of the course to be less "discussion based," the tension here is that while highly discussion based, it was student led. This contrasted with the early weeks of the semester when discussions were led by the instructors. The other instructor for the class, Trina, admitted that her "straight speech classes are much more structured and lock stepped," differentiating how she teaches speech under normal circumstances from how she taught speech in this learning community. She compares the two formats in this comment that begins with how she accustomed to teaching, "There's more of a tangible agenda that they have to do. This is more open-ended and kind of figuring, getting our bearing as we go." It presented some cognitive conflict to her, as well as the students.

The *Encouraging vs. Forcing* code is a tension largely between or within the instructors rather than students. Both instructors perceived their primary role to be that of facilitating and encouraging rather than dictating what students should do. Trina, the other instructor, believes, “first and foremost” that “positive reinforcement is better than punishment, but it’s gotten down almost now that at the end of the semester, it’s going to be punishment.” Although Trina does not prefer to punish or force students, at the time she was interviewed near the end of the semester, it was crunch time. She asserted that “this has to be done. We have a project; we have a deadline. It’s much like anything I think that happens in business and industry. The store has to open on Monday, that’s what we’ve advertised. So, we have to get this done.” We differed on that approach. Although the author feels that her role as an instructor is not to “harp on students or nag them,” she found that “some of them really want that.” When she asked them about using Twitter to remind them about work they needed to complete outside of class, they responded favorably to the idea. Unfortunately, it was too late in the semester to determine if such an approach would have had an impact.

Much of the text in the *Student Expectations* code was discussed earlier with respect to *Preconceptions About the Course* (in ***Reaction*** theme, **Prior Experience** category). In some instances, their expectations deal with the *Sequence* of the course, as illustrated in Les’s statement, “I did like that we were going to develop this, but I was kind of surprised that we were actually going to develop this a little late in the semester. I was kind of hoping that we were going

to do this a little earlier." This statement is a tension between what Les expected to happen and what actually happened rather than a tension between how the course was sequenced and the time it takes to design a game. For Nick, the expectation was that "I kind of imagined taking a class that I was going to be participating in an ARG while I was kind of like uh, while I was actually designing an ARG, so that we were, you know, like learning something about making an ARG while we were sort of playing one…and I thought the class was going to be structured that way."

Table 5.23

Codes in Instructional Methods Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Sequence/Time to Design ARG	10	1465	8.95	2.79	0.82
Guided vs. Directed Instruction	10	1243	8.32	2.59	0.76
Encouraging vs. Forcing	9	1409	8.31	2.59	0.76
Student Expectations	5	1209	5.82	1.81	0.53
Time Necessary for Consensus	5	950	5.09	1.59	0.46
Totals for Tensions Codes	**39**	**6276**	**36.49**	**11.37**	**3.33**
Attainment of Core Perspectives	18	3518	18.60	5.80	1.69
Transfer/Relevance to Real World	7	1899	8.73	2.72	0.79
Instructors/Interaction w/ them	10	1247	8.33	2.59	0.76
Open Learning Environment	9	1024	7.22	2.25	0.66
Personal Responsibility for Learning	4	1074	4.96	1.55	0.45
Encouraging Learning/Risk-taking	4	885	4.42	1.38	0.40
GVP vs. Traditional Instruction	5	556	3.98	1.24	0.36
Building/Creating Something New	4	471	3.25	1.01	0.30
Strengthening Prior Knowledge	3	593	3.12	0.97	0.28
Empowerment from Design	1	151	0.91	0.28	0.08
Totals for Successes Codes	**65**	**11418**	**63.52**	**19.79**	**5.77**
Category Totals	***104***	***17694***	***100.00***	***31.16***	***9.10***

Instructional Methods: Successes

Overall, there were more successes with respect to **Instructional Methods**, than there were tensions. The text in codes related to **Successes** represent 63.5% of this category. Within **Successes**, the strongest code is *Attainment of Core Perspectives*. However, it is important to couch this result within two caveats. The first is that the majority of the text in this category comes from the author's own description of the game that students designed given in the interview conducted by a non-participant of the GVP. In the interview, I was asked to articulate which of the core perspectives students seemed to engage with or demonstrate understanding of in the game that they had developed. Although this code is highly skewed by my description of the game, all three data analysts agreed that this text indicates *Attainment of Core Perspectives*. Indeed, while student responses were not re-coded here, virtually all of the text in the ***Transfer*** theme, which is exclusively student interview data, could also be coded as *Attainment of Core Perspectives*. The second caveat is that this code perhaps should be placed in the **Curriculum & Assessment** category since it deals with assessment. However, because the majority of the text here is a description of the game, the researchers felt it was a direct **Success** of the course design or **Instructional Methods**. As expressed in the interview, "I think that the Millennium Development Goals gave them a target or something to reach for. Something to make them think BIG."

Instead of reiterating the entire description of the game, Figure 5.6 depicts the overall structure of the game and the corresponding core perspectives demonstrated in its development. The villain in the game was a large, multi-national corporation, Dreigund, Inc., modeled after the Four Horsemen of the Apocalypse. Each “horseman” provided a symbolic frame for the four major divisions or business enterprises of the corporation.

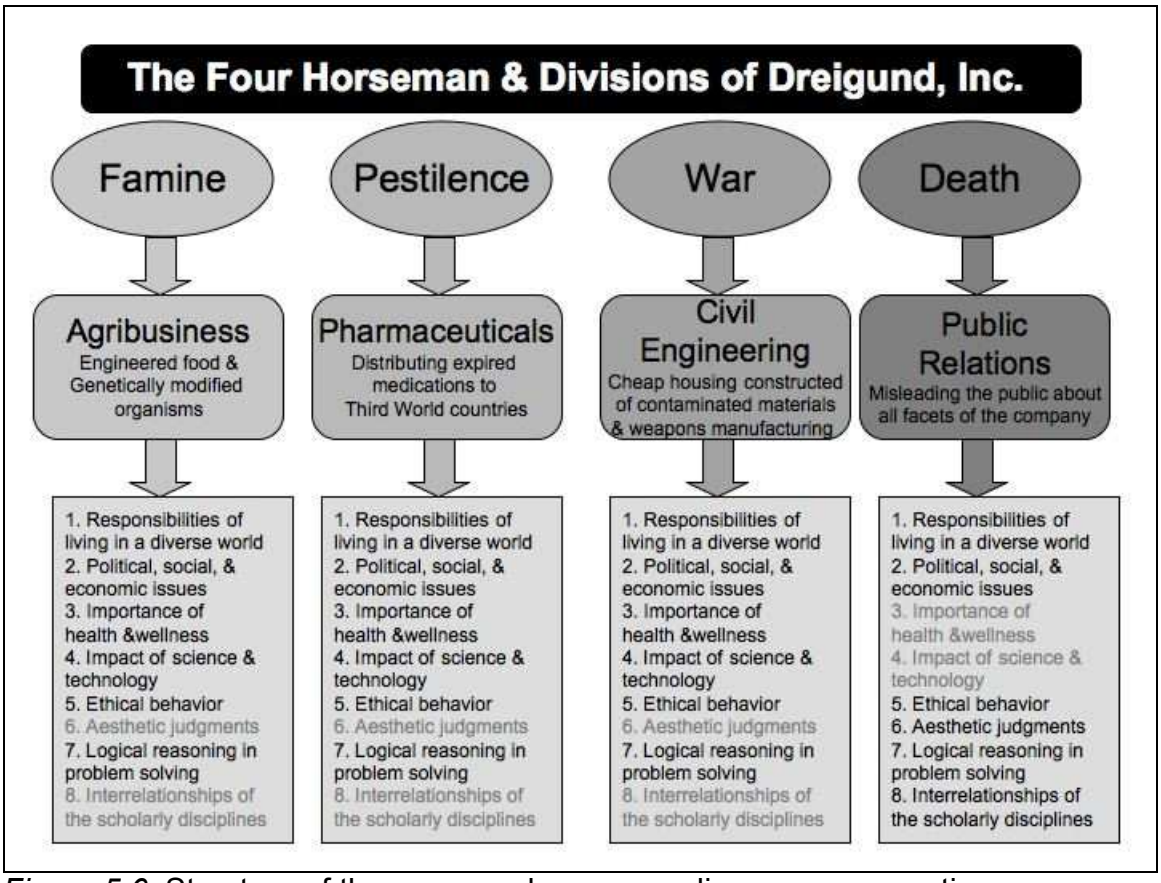

Figure 5.6. Structure of the game and corresponding core perspectives.

Each of the divisions represents a level of the game as well. The ultimate win scenario at the end of the game, will require players to realize that they, themselves, contribute to the evils enacted by the company if they do not take

some sort of action to prevent them. What students wanted the player to understand at the end of this game is that abdicating responsibility and simply blaming greedy corporate executives for the problems in the world is ultimately how those problems continue to happen.

Transfer/Relevance to Real World was the second strongest success of the **Instructional Methods**. Once again, as Les observes, “The way that [the course project] prepares you to go into real life settings. It’s basically the same thing. Same concepts.” The *Instructors/Interaction with Them* was also a success. When asked about a time she felt successful in the course, Karen recounts, “The first thing that comes to mind was when Mary Jo was first talking about ARGs…and she was linking, so I was actually understanding the concept. So I felt like, OK, maybe I can do this, maybe I do have something to contribute.” Directly related to that, as demonstrated earlier, was the *Open Learning Environment* that the instructors created. As Trina describes it, “We set up the environment, we set up the banquet table and the students come to the banquet table and either starve, as some of them have, one of them especially, or take little nibbles, or gorge themselves.” Michael confirms the success of this approach, “So this kind of class the way it’s setup, the openness of the way it is, really is a good way to learn.”

Despite the tension among students between *Guided and Directed instruction*, the emphasis on *Encouraging [rather than] Forcing* learning, did yield some acknowledgement among students of their *Personal Responsibility for*

Learning. This code was not as strong as we, the instructors, might have liked, but it was still present. As Michael reflects, “in college, you’re on your own. No one is there to tell you, ‘Hey, get up! You’ve got an assignment [to get] done. Or, ‘Hey. You’ve got homework due tomorrow.’ Or, ‘Hey. You’ve got this project due at the end of the month. You might as well get started on it now.’ But, that’s scholarly discipline that *I started to learn more so from this class than any of the others*.” The italics in the last line are the author’s emphasis, but serve to highlight the role that guided instruction played in encouraging a *Personal Responsibility for Learning*. The *GVP vs. Traditional Instruction* code captures passages cited previously in which students compare traditional learning activities, “that stagnant textbook, read Chapter 12” to what they did in the GVP.

Students: Tensions

Despite the successes of the **Instructional Methods**, and even students appreciation for **Teamwork** as documented in the ***Learning*** theme, the course did cause some tensions among students, intended and unintended. The *Lack of Leadership* among students was the strongest tension. When asked to tell about a time that he struggled in the course, Kevin expressed that the group was thinking in “too many [different] directions.” The tension for him was that “there was no leader. I think that came as a huge problem because we got so many different ideas that there was no one to say ‘we’re going to go with this one. And that’s final.’” Students also struggled with completing *Individual Tasks for Group Project* when they were away from the group between class meetings. Karen

captures this tension well when she comments, “So we’re in class and we define assignments and tasks and then sometimes I feel a little lost trying to complete or make things work together.” Nick also expressed this tension, “I guess, one of things that was frustrating to me was that it [developing the ARG] was a combination of individual work and group work, but they never uh, at least for me, they never came together.” This tension was due in large part to *Communication Challenges*, the third strongest tensions code in this category. As Kevin speculates, “I think communication. It was really the break down that ended hurting us the most.” However, it wasn’t a break of communication during in-class sessions. As will be discussed later with respect to the *Course Format* category, communication broke down outside of class between class meetings.

Non-participation/Accountability to Group was also a tension between students. I’d venture to say this is always an issue with collaborative learning. Overall, only two students, Kelly and Nick had bad experiences with this in the early part of the semester with their partners on the culture project. Nick “ended up doing the project primarily on [his] own.” For Kelly, the result was a *Conflict Between Students* rather than *Non-participation*, “we didn’t get a grade that I was happy with…and I was not happy with the presentation.” Trina felt that much of the tension among students was due to the *Student Self-Regulation Challenge*. She argued, “I think it’s really about a lack of discipline. That it’s much more fun to email or go on Facebook when you’re kind of having fun with it. I’d rather be on e-bay than answering my students’ email. And, they’d rather be on YouTube

than answering discussion questions." While the author, too, observed that students had difficulty, "managing themselves and the tasks they had to do," she's not as convinced that they preferred to be on Facebook or YouTube. Near the end of the semester when she noted that students were not completing their individual game development task outside of class because they had gotten stuck on some detail that they weren't sure about, she asked them why they didn't call someone, or email, or post a question in the wiki or the discussion board. The response was, "Are we allowed to do that?" It simply had not occurred to them that, once they had been assigned an individual group task, it would be appropriate to seek help or input from the others. The interviews indicate that they thought they were entirely on their own. The process proceeded more smoothly after that revelation, but discovery of the misperception came rather late in semester.

Table 5.24

Codes in Students Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Lack of Leadership/Too Many Ideas	10	1789	15.49	3.07	0.90
Individual Tasks for Group Project	8	1834	14.12	2.82	0.82
Communication Challenges	8	1150	11.19	2.21	0.65
Non-participation/Accountability	5	735	7.06	1.40	0.41
Conflict Between Students	4	761	6.39	1.27	0.37
Student Self-Regulation Challenge	5	522	6.15	1.21	0.36
Difficulty Organizing Group/Work	2	546	3.91	0.78	0.23
Giving Up Control/Taking Risks	1	337	2.23	0.45	0.13
Totals for Tensions Codes	**43**	**7674**	**66.54**	**13.21**	**3.87**
Learning From Peers	9	1547	13.67	2.71	0.79
Synergy/Close Relationships	5	906	7.79	1.55	0.45
Personal Responsibility to Group	4	766	6.41	1.27	0.37
Peer Teaching/Sharing Life Experiences	2	392	3.24	0.65	0.19
Roles/Others' Strengths as Assets	1	366	2.35	0.47	0.14
Totals for Successes Codes	***21***	***3977***	***33.47***	***6.65***	***1.94***
Category Totals	**64**	**11651**	**100.00**	**19.85**	**5.79**

Students: Successes

Once again, despite the tensions among students, successes were present as well. In this category, however, the tensions outweighed the successes at a ratio of 66.5 to 33.5 percent. The greatest success in the **Students** category was *Learning from Peers*, which represents almost 14% of this category. As discussed earlier, students found that they "don't learn so much from what just the teacher is teaching you. You learn from your fellow classmates." They also found that they developed *Synergy/Close Personal Relationships* with each other. This was in keeping with the friendships and close working relationships that were coded in the ***Reaction*** theme. Despite occasional lapses in participation or accountability to the group, students did feel *Personal Responsibility to Group*. This code represents 6.41% of the category, compared to 7.06% in the *Non-participation* code. In other words, this tension and this success are fairly equal. The remaining codes in the **Successes** section of this category are *Peer Teaching/Sharing Life Experiences*, which is related to *Learning from Peers*, and the way that students were able to assign *Roles* that made use of each *Others' Strengths as Assets* in the design process.

Curriculum & Assessment: Tensions

As happened with the **Students** category, there were considerably more tensions in the **Curriculum & Assessment** category than successes. In this category, the strongest tension was *Contextualizing within the ARG*, that is, a

course design in which all of the assignments or assessments are fully contextualized within the process of designing an ARG. As discussed in the third chapter, which described the course design, this was the original intent. While this code contains the author's statements regarding those original intentions, it also includes student comments about this tension. Michael recommends that, "for the curriculum of this class, if there is a final project to design the game, the class should be wrapped around that instead of putting it at as the last thing we need to worry about. " Nick concurs, saying that "it seemed like a lot of the projects weren't tied together," observing that he "wasn't really sure how the ARG really related to the first part of the class." He later added that he "saw the connections" between the first part of the class and the ARG project later, "but the connections felt superficial."

Although students did see how the ARG project related to the disciplines included in the course (speech, writing, literature, and humanities), Trina did not make that connection. According to her, "it's going to take some convincing for me this next semester to say, spending all these weeks designing a game to what end? What's the point here? What are they bringing out of this?" For Trina, this tension was in large part due to the difficulty in *Meeting Course Objectives* that often occurs in learning communities. Both she and the author were concerned with how well students attained course-level objectives, particularly for writing. As Trina put it, "I would be hard-pressed to take my [students'] English" papers "to an invisible or nonexistent committee that grilled me about, 'well, did

you meet this objective?'…our writing program asks you to do this, this, and this. And there are some real holes."

As co-instructor, I agree that there were holes in the instruction, but wonder if the writing assignments had been better contextualized within the game scenario, we might have better fostered them. As it turned out, students were individually trying to complete their course research papers at the same time that they were collaboratively working on their respective parts of the game design documents. The result was that students did not execute either writing activity was particularly well. Arguably, had they been combined into a research supported game design document, the writing may have been better. At a minimum, students' efforts could have been more focused.

Another significant tension was *Communicating Expectations*. As stated in the author's interview, "I think that problem-based methods require much clearer communication of expectations, that is, clear articulation of how the instructor will tell if students 'got it' or not." While most students found the scoring rubrics for their presentations and writing assignments to be adequate, one student struggled a bit with what he perceived to be the subjective nature of evaluating speech and writing. According to Nick, "I haven't always felt that my assignments or my grade were as well defined as I would like them. In some of the speeches that I had given, I just get a grade. It's a subjective assessment. So like, I don't know what the difference between a 94 and a 95 is." This statement is perplexing because all students were given substantial feedback including extensive

comments and a break down of the grade provided on the scoring rubric. Nevertheless, those rubrics and the expectations that they convey might need to be explained more fully prior to the assignments in future iterations of the course.

The *Covering Material* code is indicative of another tension with problem-based learning methods. Although Trina professes “all of the courses I teach are problem-based,” her conception of what this means was quite different than the author’s. Her approach to teaching relies heavily on covering material, as opposed to presenting an ill-structured problem and allowing students to discover material as they work toward solutions to that problem. As she stated in her interview, “I’m not comfortable with what little we covered in speech. I’m not comfortable with the lack of diversity of literature that my other classes get.” Further, she questioned, “How is that [the game project] reinforcing Speech? It does bring group dynamics into the equation, which is part of Speech. And we heavily drilled them in Humanities.”

What her statements suggest is that while students were engaged in practicing the group dynamics that they would have studied in a textbook and perhaps been “heavily drilled” on in her other speech courses, Trina did not see the value of practice and discovery as opposed to covering that material explicitly. It was because of this epistemological frame, that the course took on a *“Learn Then Apply”* sequence during the first part of the semester, so that the instructors might cover some material first. It was believed that students would then apply the covered material to development of the game. What seemed to

happen as a result, however, was that they perceived their activities with developing the game (the writing and presentations associated with game development) to be added work that was less important, "superficial" even, or "an afterthought."

Table 5.25

Codes in Curriculum & Assessment Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Contextualizing C&A w/I ARG	13	2132	21.71	3.82	1.12
Meeting Course-level Objectives	7	1424	13.10	2.30	0.67
Communicating Expectations	5	1629	12.48	2.19	0.63
Covering Material/Content	6	740	8.78	1.55	0.45
Assessing Core Perspectives	3	541	5.26	0.93	0.27
"Learn then Apply" Approach	2	461	4.02	0.71	0.20
Totals for Tensions Codes	**36**	**6927**	**65.35**	**11.5**	**3.34**
Integrating Disciplines	8	1375	13.68	2.41	0.70
Enjoyed the Course	10	900	12.93	2.29	0.68
Content Establishes Foundation	3	401	4.55	0.80	0.24
Increased Substance	3	194	3.49	0.62	0.18
Totals for Successes Codes	**24**	**2870**	**34.65**	**6.12**	**1.80**
Category Totals	***60***	***9797***	***100.00***	***17.62***	***5.15***

Curriculum & Assessment: Successes

Nevertheless, the course did achieve some successes in terms of **Curriculum & Assessment**. As noted earlier, it appeared to foster attainment of the core perspectives. That was due in part to the ARG scenario, but it is also a by-product of learning communities, which are particularly well-suited for *Integrating Disciplines*. As Trina exclaims, "that's why I love and believe in these learning communities is that they get something better than… They see this connection, they see this whole… holistic rather than lock-stepped into their little

discreet courses." The students found that to be "the best part of it" as well, "because you have to connect a lot of different things." They attribute *Increased Substance* to this feature of learning communities, finding that "I've gotten more of the meat and more substance" and "more of a broader base" than in courses focused on a single content area. They also saw how the *Content Established a Foundation* for developing the game. The goal of the Learn Then Apply approach in Trina's own words was "laying a good slab foundation for archetype, myths, stories, story narratives, story boarding." Although she laments that she didn't see how developing the game applied those concepts, the students made the connections to it. Michael reports that he "can understand the way things were setup this way." Les even admits that he enjoyed the early semester activities. "I can't say that I didn't actually enjoy the stuff beforehand. That it would actually kind of set the foundation, the bricks and all that sort of stuff that lead to the game, so you're able to develop it better." Their regret was that there wasn't as much time to work on the game as a result.

Technology: Tensions

The **Technology** category represents less than 10% of this theme, but is a category with more successes than tensions. Only one student expressed the perception of *Technology as an Impediment to Learning*. Kevin felt that they "were being introduced to so much, so many different types of communication over the internet that it was hard for us to figure out which one everyone else was using." As explained earlier, this was less an issue with the technology than with

communication. Students were given a variety of tools to enable communication, but they never really self-organized around a single tool or set of tools that worked well for their unique dynamic. One technology found to be an impediment to their learning was that much of their individual writing was assigned as blog posts. Although it was carefully explained that these writing activities were "mini-essays" and would be evaluated on their effectiveness as compositions, students did not appear to take them as seriously as pieces of writing given the informality of the weblog context.

Table 5.26

Codes in Technology Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Tech as Impediment to Learning	7	1060	20.69	1.98	0.58
Limitations of Learn Lab	3	382	8.23	0.79	0.23
Totals for Tensions Codes	**10**	**1442**	**28.92**	**2.77**	**0.81**
Tech as Organizer/Motivator/Comm	7	1403	23.73	2.28	0.66
Learn Lab Enhancing Learning	7	1386	23.58	2.27	0.66
Tech as Tool to Improve Learning	3	738	11.38	1.10	0.32
Co-Learning w/ Students	2	428	7.02	0.68	0.20
Increased Confidence w/ Tech	2	240	5.35	0.51	0.15
Totals for Successes Codes	**21**	**4195**	**71.08**	**6.84**	**1.99**
Category Totals	***31***	***5637***	***100.00***	***9.61***	***2.80***

Although students reported thoroughly enjoying meeting in the Learn Lab, Kevin pointed out one of its *Limitations*, namely that there's only one computer station. Kevin observes is that "you have much more focus…on one person…on one task. Than when you have multiple peers (on their own work stations) and people are kind off in their own world. So it's a good." However, he found that

"people had to have laptops to be working with technology. Only one person could be working with" the technology in the room. He was "used to collaboration where everyone has a computer and everyone has access to the same technology so you can work faster. This was a little bit slower."

Technology: Successes

The successes with technology outweighed the tensions. Student comments about *Tech as Organizer/Motivator/Communicator* have largely been previously cited, particularly those passages in which they found the technology they learned to use in the course to be useful to their everyday lives. Issues of access aside, they found the *Learn Lab to Enhance Learning* rather than detract from it. As an instructor, Trina was captivated by the affordances of the Learn Lab. She finds that "the image is the message and you have access right away if there's a question about an archetype or there's a wonderful YouTube video on that…or, let's go to the dictionary.com. The moment isn't lost, we can go right to it. And, it deepens and enriches the discourse. So, that has been really wonderful." Adam's comment on *Technology as Tool to Improve Learning* is quite astute, "I think the more you use technology the more you can do because at least if it's good technology and it's working correctly it can help make the learning easier."

Epistemology

This category largely captures the epistemological differences *Between Instructor & Design* or *Between Instructors*. Not only is this category less significant than others based on coding, its strongest weights are the instructors' perspectives rather than the students' and those tensions are largely explained in the **Curriculum & Assessment** tensions. As the principal designer of the course, it was important to the author that course activities be mutually agreeable to the respective epistemological viewpoints of both instructors and that Trina "buy into it." As stated in my interview, "the very best parts of the course were those that we were able to build together: the Superhero speech assignment, for example," which adapted an assignment that Trina uses in her speech courses to the unique context of the GVP. However, at the end of the course, Trina was still "not sure that the weeks and the weeks and the weeks that we have spent developing a game has efficacy in terms of the long-term strategies."

Table 5.27

Codes in Epistemology Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
Between Instructor & Design	9	1516	28.23	2.68	0.78
Between Instructors	4	861	14.18	1.36	0.39
Between Students	4	615	12.03	1.14	0.33
Between Student & Design/Methods	4	514	11.15	1.05	0.31
Within Student/Learning Preferences	2	611	8.66	0.84	0.24
Totals for Tensions Codes					
Value of Opinion w/ Respect to Design	4	809	13.73	1.31	0.38
Instructors' Values Align w/ Design	3	804	12.02	1.16	0.34
Totals for Successes Codes	**7**	**1613**	**25.74**	**2.47**	**0.72**
Category Totals	***30***	***5730***	***100.00***	***9.54***	***2.78***

Course Format: Tensions

Most of the tensions among students were aggravated by the course format, the blended or *Hybrid/Half Online* format that included only *One Meeting Per Week*. On the one hand, the hybrid format might well have worked if the class met more frequently. As Les points out, “I think it would have done better if it…met twice a week instead of the one.” It is not quite clear if it was less frequent meetings or reduced class time that was the critical issue. Much later in his interview, Les puts it this way, “I just think the class needs to be offered more often...instead of being just once a week, I think it needs to be one of those consistent ones that at least be two a week or three times a week or something.” It might well have simply been too long a period of time in between. However, some students simply did not like that it was *Hybrid/Half Online*. Kevin states that he thoroughly enjoys using the technologies that afford distance education, such as the learning management system and the course wiki, but he “would rather have that as a supplement instead of half the class.” The reason he gave for this preference was “you had a lot of ‘you need to do this’ and ‘come back with this’,” which leaves one wondering what he expected might occur in class. He seems to feel that class time could have been devoted to preparing or completing what was “homework” online.

As Trina observed, “there’s still brick and mortar in their concept.” Students seemed to feel that they could “show up three hours a week in the class and that’s all [they] need to put into it.” They exhibited a degree of *Reluctance to*

Work Online, but only Kevin expressed that he was “not one of those people that do very well with online classes.” On the other hand, more of them commented that the course left *Inadequate Face Time*, particularly for developing the game. Had they realized that they should have been communicating with each other outside of class during this phase of the course, their perceptions might have been different. With respect to getting clarification from her classmates on individual tasks for group work, Karen acknowledges it’s “not that I think that there hasn’t been opportunities, there has been opportunity,” but they didn’t make the best use of that opportunity.

Course Format: Successes

Although they struggled a great deal with *Working Together while Separated*, once students discovered that they should be communicating with each other outside of class, they expressed feeling successful at *Working Together while Separated*. They also felt that size of class, “stood out in that it was such a small group,” largely because it was better than “having 20 or 30 other people trying to get their ideas in.” Above all, they liked that it was a *6-Credit Class*, which was seen as “a very good way to get your credits done.”

Table 5.28

Codes in Course Format Category

Code	Pass	Char	% of Category	% of Theme	% of Total Text
One Mtg. Per Week	6	1093	20.64	1.86	0.54
Hybrid/Half Online	7	862	19.62	1.81	0.53
Reluctance to Work Online	7	858	19.57	1.80	0.53
Inadequate Face Time	5	336	10.99	1.04	0.31
Class Size	3	277	7.41	0.69	0.20
Totals for Tensions Codes	**28**	**3426**	**78.23**	**7.20**	**2.11**
Working Together While Separated	2	948	13.19	1.14	0.33
Class Size	2	160	4.67	0.44	0.13
6-Credit Class	2	90	3.91	0.38	0.11
Totals for Successes Codes	**6**	**1198**	**21.78**	**1.95**	**0.57**
Category	***34***	***4624***	***100.00***	***9.16***	***2.69***

Institutional Tensions & Successes

Institutional Tensions & Successes contained passages from instructors only and represented such a small portion of the text that they aren't discussed here. However, Table 5.29 reports the number of passages and characters in this category, as well at the codes and their weights within the category, theme, and total text.

Table 5.29

Codes in Institutional Category

Code	Passages	Characters	% of Category	% of Theme	% of Total Text
Load	2	521	26.52	0.76	0.22
Retention	3	279	22.24	0.69	0.20
Time	3	259	21.54	0.68	0.20
Teaching Partner	4	373	29.69	0.93	0.27
4	**12**	**1432**	**100.00**	**3.06**	**0.90**

Summary

The ***Learning*** Theme comprises the most overall text coded in this study, followed by the ***Results***, ***Transfer***, and ***Reaction*** themes. The following were the top five categories with respect to the overall text:

1. **Self-Reflection**, in ***Learning Theme*** (10.02%)
2. **Instructional Methods**, in ***Results Theme*** (9.10%)
3. **Knowledge Construction**, in ***Transfer Theme*** (7.90%)
4. **Teamwork**, in ***Learning Theme*** (7.17%)
5. **Students**, in ***Results Theme*** (5.79%)
6. **Game Scenario**, in ***Learning Theme*** (5.70%)
7. **Prior Knowledge**, in ***Learning Theme*** (5.59%)
8. **Respect for Others**, in ***Transfer Theme*** (5.43%)
9. **Curriculum & Assessment**, in ***Results Theme*** (5.15%)
10. **Instructional Design**, in ***Reaction Theme*** (3.96%)

The next chapter draws conclusions from these results, assesses their implications with respect to evaluating the design, and presents directions for future research.

CHAPTER 6

CONCLUSIONS & IMPLICATIONS

Introduction

Having examined the codes and categories within each theme as well as their relationships to the total text analyzed in this study, this chapter returns to the research questions to draw conclusions about the effectiveness of the design of the Global Village Playground (GVP). This includes a discussion of the implications for modifying the design given the emergent tensions identified in the previous chapter following these conclusions. Finally, areas in need of further research exploration will be identified as directions for future research.

Conclusions

Reactions to the GVP

The first research question focused on identifying student and instructor reactions to the course and the course design. Overall, students reacted favorably to the GVP. They found the course activities, predominantly student presentations, team projects and class discussions, to be effective ways to learn. They also found their experience to be “enjoyable,” particularly the “open” and “safe” learning environment fostered by the instructors. They seemed to prefer learning in this way when compared with traditional methods of instruction,

findings in keeping with scholarship on student engagement (Chickering & Gamson, 1987; Chickering & Gamson, 1991; Koljatic & Kuh, 2001; Kuh, Pace, & Vesper, 1997). They also enjoyed learning with technology. However, they reacted more favorably to the technology in the classroom than the hybrid design. They enjoyed the communication tools that allowed them to keep in touch outside of class, but did not like learning on their own at a distance as much as face to face contact. This conclusion, too, aligns with prior research on student engagement, particularly the literature on satisfaction and engagement with distance learning environments (Conrad, 2002; Hassenplug & Harnish, 1998).

The students also indicated that the early part of the course did not seem as well connected to later parts of the course as it could be. They wished that developing the ARG, the central problem scenario for course, came earlier, but they did respond favorably to the activities in the first several weeks of the course nevertheless. Indeed, in some ways, they seemed to prefer those weeks because assignments and activities were more instructor-directed than the activities in the game development phase of the course. Although the instructors actually guided class discussions rather than led them, in the later part of the course, student work was largely *student* led. Instructors merely listened in and coached, and student tasks and activities were identified by the students rather than assigned by the instructors. This caused students some cognitive conflict, a response often associated with problem-based learning methods (Savery & Duffy, 1995).

Nevertheless, students liked the multi-disciplinary nature of the learning community and responded favorably regarding their peers as well. The close personal relationships that developed among students are the very foundation of learning communities (McHugh Engstrom & Tinto, 2008), and these relationships flourished despite the reduction in face-to-face contact of the hybrid delivery of the course.

Impact of the Design on Student Learning

The second research question pertained to the impact of various aspects of the course design on how students learned. This particular group of students was very self-reflective. Both the nature of the course, which engaged them with big questions, and the open-ness of the learning environment seemed to foster this reflective vein. They reflected most on how well they learned from peers through discussions in class led by both instructors and students, a promising finding with respect to constructivist learning environments (Duffy & Cunningham, 1996; Jonassen, 1999). Students gave as many if not more presentations to the class than the instructors, particularly in the early part of the class. Their personal interests were given voice in such a multi-disciplinary class, and when they were able to find common ground with their peers, they seemed particularly successful. They also seemed to acquire an appreciation for differing perspectives and located the source of their own developing conceptions, perspectives, and views as this peer interaction. Although relying on peers to contribute to team tasks presented frustrations, students learned some strategies for coping with those

frustrations, and saw how their own self-discipline was important when others were relying on them. They were most motivated by the relevance of the learning tasks, a finding that aligns with prior research on problem-based learning, particularly the recent research on The Door, problem-based ARG (Warren, Dondlinger et al., 2008). They were also highly motivated by personal interests and goals, which is closely connected to relevance in that one relates most easily to those things relevant to his or her personal interests.

While students seemed to prefer the more structured nature of the first part of the course, they learned a great deal from the game scenario; the data suggests that they learned more from that central scenario than through the activities dedicated exclusively to course content. This finding is in keeping with theories of situated learning, which posit that learners learn more and transfer further knowledge acquired through authentic contexts and tasks (Bransford et al., 2003; Lave, 1988; Lave & Wenger, 1991; Vanderbilt, 1990, 1993). Moreover, the game scenario compelled them to bring their own prior knowledge and personal interests to bear on the project while they integrated and applied what they discovered to creating a rich learning and play experience for others. They seemed particularly concerned with making the game a meaningful experience for players, wanting the game to be coherent and seamless although not without its challenges. Of the activities prior to developing the game, the group culture project seemed to have the most impact on their learning. The course was sequenced such that students could apply what they explored through this project

to the actual game. Although students did apply much of their prior knowledge and some of what they learned in the course to the development of the game, they didn't use as much of they learned about other cultures in the game itself. Levels of the game were "located" in the different countries student groups explored, but they didn't incorporate aspects of those cultures into the game narrative. In other words, they didn't use the art, architecture, or literature as pieces of the design puzzle.

With respect to technology, they developed an appreciation for how technology afforded clearer communication in presentations. They seemed to learn from the online discussion boards while they lasted during the first part f the class. However, they did not make as much use of the tools for communication during the game phase. This is likely because they didn't realize it was "allowed" or that they should have been doing so as reported in the Results chapter.

Core Perspectives and Conceptual Age Thinking

The third research question explores the extent to which the course promoted attainment of the overarching program objectives, the core perspectives, and advanced conceptual age thinking. The *Knowledge Construction* category and sequence of codes that comprise it strongly suggest that the course was successful in fostering both the synthesis or big picture thinking vital to the conceptual age and the last of the core perspectives, integrating knowledge from the scholarly disciplines. The other categories, **Social Responsibility**, **Open-mindedness**, as well as **Individual or Personal Values**

suggest that students achieved a measure of the empathic thinking needed in the conceptual age and several of core perspectives, specifically those related to the relationship between self and society, the responsibilities of living in a culturally and ethnically diverse world, and the development of values for ethical behavior.

Students learned to appreciate other perspectives and opinions, work through conflicts to build consensus, identify each other's strengths, talents and goals in order to benefit from these strengths rather than vilify weaknesses. They learned to value being informed and critically evaluate rather than blindly accept things at face value. They developed an appreciation for self-expression, emotion, and creativity as opposed to relying solely on logical rationalizations, evidence of conceptual age thinking (Pink, 2006). They came to appreciate the beauty of the ideas that an object might express even if the object itself did not seem particularly beautiful. In short, they came to appreciate wholeness and found that achieving balance among mind, body, and spirit to be important—another conceptual age ideal, namely perceiving the relationships among things simultaneously and understanding the "big picture" (Pink, 2006). They also expressed and demonstrated an open-mindedness about new technologies, particularly the tools they acquired for collaboration, which suggests development of an appreciation of the importance of communicating at a distance. They also saw how they might apply and use these technologies in their personal lives, to become better organized and improve communication, vital 21st century skills (Kelly, 2005; Safflund Institute, 2007; Schrier, 2006). They demonstrated a

marked willingness to re-evaluate old ideas as they acquired new information--a continuation of knowledge construction and further evidence of synthesis or conceptual age thinking.

The expressed a new awareness of themselves in relation to the larger society—even world. They felt “more connected to the world as whole” and “more of a global citizen,” learning outcomes vital in a global marketplace (Peter D. Hart Research Associates, 2008). Moreover, the term, “citizen,” denotes both an empathy for fellow citizens as well as an imperative for action (Pink, 2006). The idea that one is complicit with those who perpetuate evil in the world if one does nothing to stop them, which was the overarching message in the game that students developed, is indicative of some key core perspectives as well as conceptual age thinking (Pink, 2006; Texas Higher Education Coordinating Board, 1999). The data suggests that students find this imperative to pertain to protecting the planet, preserving justice, and following the mantra to “do no harm.”

Challenges and Tensions

Despite these successes, several challenges or tensions emerged from the design. The strongest of these tensions was the amount of time necessary to develop the game. On the one hand, part of this tension was the reduced face time resulting from the hybrid design. However, much of that was alleviated once students realized that they could and should be communicating with each other at a distance. They thought they were to work on their own on their individual tasks

for the game without assistance from peers; thus, when they were uncertain about how to proceed, they stopped working until the next class meeting. It didn't occur to them to simply call someone, post a question in the discussion board, or send an email. On the other hand, face-to-face time is necessary to build consensus, particularly when a relatively large group is working on a single project. Getting everyone on the same page, establishing a common vision or concept is critical to this effort, and that process takes time. Since the game was not completed, clearly more development time was needed. Whether this was due to the course sequence or the hybrid nature of the course is less certain.

Problem-based Learning and Instruction

The tension between guided as opposed to directed instruction was also strong. Students seemed to learn the most from developing the game, a project that was much less instructor-directed, but preferred learning with more direction. This finding is not unusual among students accustomed the directed instruction typified in an education system focused on preparing students for standardized tests (Kelly, 2005; Ladd, 2008; Wasley, 2008). This preference for more direction was also aggravated by the hybrid delivery mode as online learning requires more self-direction. However, the ill-structured nature of the game development project itself also perturbed them. They enjoyed the creativity, the application of knowledge, discovery of new ideas, and the relevance to their emerging and future values. This caused some psychological vertigo or cognitive conflict (Savery & Duffy, 1995). The project also caused the other instructor some

internal conflict. While she prefers the role of encouraging rather than forcing students to learn, she sought ways to compel students to complete assigned tasks, in large part due to institutional pressures to retain students and ensure their successful completion of the course. As co-instructor, I was not insensitive to these pressures; however, I am reticent to regulate students too closely. Learning to adapt to challenging situations and to become self-directed are vital skills—ones that cannot be fostered through continuous intervention by instructors (Grabinger, 1996; Jonassen, 1999). Finding the appropriate balance between directing students and allowing them to develop these skills themselves can be difficult. However, students recognized the need to become more self-directed and take personal responsibility for their learning from the game design scenario. This recognition came "*more so from this class than any of the others*" according to class participants and is critical skill called for in the AAC&U poll, which informed the design (Peter D. Hart Research Associates, 2008). Moreover, the impact of developing the game on the broader learning goals, the core perspectives and conceptual age thinking was demonstrable (Pink, 2006; Texas Higher Education Coordinating Board, 1999).

Project Leadership

The strongest tension among students when designing the game was the lack of leadership, which further illuminates the tension between directed and guided instruction. At one point in the game development phase, students discussed their need for a leader, a designated person who would serve as final

arbiter to keep things going. I concurred and encouraged them designate one. However, they ultimately appointed me rather than a peer. None of them wanted the responsibility, and they all wanted more direction. I continued to guide their process but did not dictate or direct them. I simply served in the capacity they described, which was as final arbiter in concept disputes. Their uneasiness with the lack of direction was compounded by the dwindling time and impending end of the semester; being told what to do speeds things up. Consequently, this was a source of tension among students. For the most part, other tensions among students related to self-regulation, participation, and individual accountability, the usual challenges that occur in group projects (Johnson & Johnson, 1994). Despite these challenges, students learned from each other and preferred that mode to learning from the teacher. With the exception of Adam, who frequently missed class, rarely delivered on his assigned tasks, and annoyed the others when he was present, the group was very forgiving, empathized with each other, and developed strong, learning community bonds.

Situating Learning in Context

Tensions pertaining to curriculum and assessment were also fairly strong and tightly connected to the sequence of the course. While students enjoyed the early part of the class, they felt that the connections between the first and second part were “superficial.” (Lauzon, 1999; Orey & Nelson, 1997). Indeed, they didn’t end up applying what they had learned from their culture projects to the game beyond establishing the locations of levels. Trina was disappointed that students

didn't fold the archetypes that students explored in their culture projects to development of the game. Had the culture project been contextualized within game development from the start they might well have been applied better. However, since this project came so much earlier in the course, much of what students presented to each other were distant memories by the time they were immersed in game development. In fact, a plausible reason that students were unable to finish the game is that they were generating new material for an overarching game concept that they had developed much later. Had the game concept been underway while students were presenting the information they had discovered while researching other cultures, they likely would have used more of that content in the game. Contexualizing the culture project within the game development project would still satisfy the need to "cover some material," but would allow students to immediately identify how that content applies and should promote greater transfer to the new context, the game.

Format of Course Delivery

The tensions regarding course format, namely the hybrid delivery, have already been addressed, but deserve more attention. Clearly, the hybrid mode had an impact on time necessary to build consensus and to develop the game. However, that might well have been more of an issue with the sequence of the course and the fact that course activities weren't connected directly to game development. Another interpretation might be that student dependence on directed instruction made them dislike the hybrid format rather than the hybrid

detracted from the meeting time necessary the develop the game. Clearly, self-direction played a role in the tension with the hybrid format as well. However, it was not an aversion to technology that kept students from engaging with each other online. Indeed, a greater contributor to the tension was that the course only met once a week. It's quite possible that if the class met more frequently, rather than for more hours (twice a week for an hour and a half, for example) student perceptions might have been dramatically different. The length of time between meetings allowed students to put off tasks for a time, in some instances forgetting about them. More frequent class meetings could make course tasks more routine and increase student accountability to each other. Indeed, if game development occurred throughout the semester, students might have been more involved and engaged with the online communication from the start.

Implications

Begin Game Development Sooner

Although a great deal of the attainment of the core perspectives and conceptual age thinking that were the goals of the course can be attributed to both the course content and the game design scenario that followed later, game development must begin at the onset of the course for the project to be more fully effective. Much learning occurred in the course, but that learning (of the core perspectives) came at the expense of some of the course level competencies, particularly reading and writing. Beginning game development in the first week

need not detract from other course activities. Indeed, it could enhance them by providing a situated context for them. For example, if students had already begun to establish an overarching game concept when they gave their culture presentations (which followed the informative speech requirements mandated by speech curriculum), the discussion that immediately ensued following each presentation could have been an evaluation of what parts of the cultural production of that culture applied to the game concept. It would also have better situated the proposals and research bibliographies that were components of this project to a more relevant context than the class itself (Brown, Collins, & Duguid, 1989; Lauzon, 1999). As the course was sequenced, these assessments were perceived to be busywork, hoops to jump through in order to get to development of the game (Hickey et al., 2006).

Foster More Interdependence

One of the course successes, perhaps a success of the hybrid design, was the self-direction that it obliged students to develop, an aptitude vital to life-long learning and an asset in a global knowledge economy (Peter D. Hart Research Associates, 2008). While the hybrid format did decrease the amount of face-to-face contact, results are inconclusive regarding whether or not students would have developed this self-direction if the class meet six hours a week instead of three. Nevertheless, students should not feel hindered by the delivery mode of a course. Clearly the class needs to meet more frequently, and instructors need to more clearly communicate to students that they are expected

to be working together while apart. Nevertheless, more frequent meetings would likely enhance personal accountability to the group since it's more difficult to procrastinate on assignments when one has to face those who are expecting it in person.

Using the technology with which students routinely communicate might also promote greater interdependence (Bonk & Zhang, 2008). While half of the students in the GVP routinely logged into the course management system because they were using it for other courses, the other half did not do so habitually. Moreover, email reminders were not particularly effective with students who rely more heavily on their cell phones and instant messengers. However, web tools such as Twitter or the new SMS function in Google mail could be leveraged to reach students on their mobile devices and keep them more instantly in touch. The caution in using such tools, however, is to employ them in a way that enables students to support one another rather than increase their reliance on the instructor (Johnson & Johnson, 1994). Engaging students' personal interests and prior experiences by beginning game development earlier, so that they're not forced or directed to communicate with each other, but are eager to do so, might also encourage more interdependence.

Enable Group Self-organization

Engaging students in the central problem scenario and fostering interdependence sooner could also allow students groups to better self-organize. As several students indicated in their interviews, identifying each other's

strengths takes time. Promoting concept development and greater interdependence earlier could better allow these strengths to emerge, so that students can assign and shift roles with greater facility (Brush & Saye, 2001; Johnson & Johnson, 1994). For example, one student might take on a leadership role for one phase of the process and then pass the torch to another later on, so that no one student bears the all of the responsibility throughout. In this pilot of the GVP, student leaders emerged in each of the small group projects early on, but the class had more difficulty appointing those roles during the game development project because their concept for the game and their familiarity with each other's skills and abilities relative to the entire group were still emerging.

Encourage Play

One student, Nick, indicated that a preconception he held prior to the course was that the course itself would be structured like an ARG so that students were "sort of playing one while they were designing one." Although the course was not promoted in a way that led to such a preconception, the designer did consider creating a mini-ARG to orient students to the genre. However, since a principal tenet underlying this application of games for learning was to avoid the assumptions inherent to *designing for* students, the designer/instructor walked through an existing ARG with students in class and tasked them with exploring other ARGs and discussing their features in the online discussion board. Nevertheless, another principle that drove the design, specifically this application of games to learning, was the finding from the research on The Door

ARG that engaging with the problem-based game tasks encouraged a sense of playfulness—a willingness to explore and take risks (Warren, Dondlinger et al., 2008). The structure and sequence of the GVP did not allow this quality to emerge. However, enhancing the online part of the class with game elements might go a long way to encouraging this willingness to play while also orienting students to the ARG genre, content for the course, and even to each other as they begin concept development.

Directions for Future Research

Although this pilot implementation of the GVP met with some success, a direction for future research is to compare these results with those from an implementation in which course assignments are contextualized within the game development process, which takes place throughout the whole semester. The goals of such a redesign would be to enhance learner attainment of the course level competencies by situating the assessment of them in a more relevant context of practice. Although the number of participants in this study limits conclusions to be drawn through comparisons to future iterations of the design, evaluation of student perceptions of the experiences in future designs is an important next step.

Designing an ARG for students to play prior to developing one is another direction for future research. In fact, this design approach, which combines elements of The Door with those of the GVP, is currently underway. It should be noted, however, that playing an ARG first and developing one later is not the

approach that the findings from this study suggest. These results indicate that game development should begin early and that course assignments should be contextualized fully into the game development process. A “play then develop” approach might produce results similar to these results from the “learn then apply” approach deployed in this course. However, a comparison of findings between the different iterations of these curricular designs using ARG elements, including an iteration of the GVP in which game development occurs throughout the semester, will provide further insight into the outcomes associated with games *designed for*, *designed with*, and *designed by* learners.

Another area for future exploration is the course format. Comparing the use of the distance learning components to the frequency and duration of class meetings is an area ripe for further research. Examining them both when game development begins earlier and course assignments are fully contextualized in the problem scenario will enable us to make better assertions about the role of distance communication tools and student self-reliance, assertions that aren’t obfuscated by the time necessary to build consensus or develop a game concept.

Finally, a comparison of the GVP to other capstone course designs is another area for future research. At least one other capstone learning community has been developed and implemented at the college where this study was set. This other learning community employed more traditional methods of instruction. Comparing outcomes between these two capstone experiences may illuminate

the efficacy of problem or project-based methods in fostering attainment of the overarching objectives of the academic transfer program.

REFERENCES

Aguilera, M., & Mendiz, A. (2003). Video games and education: Education in the face of a "parallel school." *ACM Computers in Entertainment, 1*(1), 10-10.

Albanese, M. A., & Mitchell, S. (1993). Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine, 68*(1), 52-81.

Aldrich, C. (2003). *Simulations and the future of learning*. San Francisco: Pfeiffer.

Amory, A., Naicker, K., Vincent, J., & Adams, C. (1999). The use of computer games as an educational tool: Identification of appropriate game types and game elements. *British Journal of Educational Technology, 30*(4), 311-321.

Annett, J., Duncan, K. D., Stammers, R. B., & Gray, M. J. (1971). *Task analysis*. London: HMSO.

Armour, S. (2005, November 8). Generation Y: They've arrived at work with a new attitude [Electronic Version]. *USA Today*. Retrieved February 28, 2009 from http://www.usatoday.com/money/workplace/2005-11-06-gen-y_x.htm.

Barab, S. A., & Squire, K. (2004). Design-based research: Putting a stake in the ground. . *Journal of the Learning Sciences, 13*(1), 1-14.

Barab, S. A., Warren, S. J., & Ingram-Goble, A. (2008). Academic play spaces. In R. Fertig (Ed.), *Handbook of research on effective electronic gaming in education*. Hershey, PA: Idea Group Reference.

Barab, S. A., Zuiker, S., Warren, S. J., Hickey, D., Ingram-Goble, A., & Kwon, E.-J. (2007). Situationally embodied curriculum: Relating formalisms and contexts. *Science Education, 91*(5), 750-782.

Barrett, H. C. (2007). Researching electronic portfolios and learner engagement: The REFLECT initiative. *Journal of Adolescent & Adult Literacy, 50*(6), 436.

Barrows, H. S. (1986). A taxonomy of problem based learning methods. *Medical Education, 20*, 481-486.

Baudrillard, J. (1994). *Simulacra and simulation*. Ann Arbor: University of Michigan Press.

Bernstein, R. J. (1976). *The restructuring of social and political theory* (6th ed.). Philadelphia: University of Pennsylvania Press.

Bernstein, R. J. (1983). *Beyond objectivism and relativism: Science, hermeneutics, and praxis*. Philadelphia: University of Pennsylvania Press.

Bernstein, R. J. (1993). *The new constellation: The ethical-political horizons of modernity/postmodernity*. Cambridge, MA: MIT Press.

Blom, K. (2001). VET in the United States of America. *Research Digest, 7*, 5.

Bogost, I. (2007, September 1). An instructional alternate reality game. Retrieved March 9, 2008, 2008, from http://www.watercoolergames.org/archives/000842.shtml

Bonk, C., & Zhang, K. (2008). *Empowering online learning*. San Francisco: Jossey-Bass.

Borland, J. (2005, February 28). Blurring the line between games and life. CNET News.com. Retrieved February 19, 2008, from http://ecoustics-cnet.com.com/Blurring+the+line+between+games+and+life/2100-1024_3-5590956.html

Bransford, J., Vye, N., Bateman, H., Brophy, S., & Roselli, B. (2003). Vanderbilt's AMIGO project: Knowledge of how people learn enters cyberspace. Retrieved April 20, 2004, from http://www.vanth.org/mmedia/vanth0103/vanth0103cd/papers/AmigoWFig.pdf

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32-42.

Brush, T., & Saye, J. (2001). The use of embedded scaffolds with hypermedia-supported student-centered learning. *Journal of Educational Multimedia and Hypermedia, 10*(4), 333-356.

Burrow, A., & More, G. (2005). *Architectural designers and the interactive audience.* Paper presented at the 2nd Australasian Conference on Interactive Entertainment, Sydney, Australia.

Campbell, J. (1972). *The hero with a thousand faces*. Princeton, NJ: Princeton University Press.

Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education [Electronic Version]. *AAHE Bulletin*. Retrieved March 29, 2006 from http://www.csueastbay.edu/wasc/pdfs/End%20Note.pdf.

Chickering, A. W., & Gamson, Z. F. (1991). Development and adaptations of the seven principles for good practice in undergraduate education. *New Directions for Teaching and Learning* (Winter), 75-81.

Cognition and Technology Group at Vanderbilt. (1990). Anchored instruction and its relationship to situated cognition. *Educational Researcher, 19*(6), 2-10.

Cognition and Technology Group at Vanderbilt. (1993). Anchored instruction and situated cognition revisited. *Educational Technology, 33*(3), 52-70.

Conrad, D. (2002). Engagement, excitement, anxiety, and fear: Learners' experiences of starting and online course. *American Journal of Distance Education, 16*(4), 205-222.

Corbit, M. (2005). Moving into cyberspace: Game worlds for learning. *Knowledge Quest, 34*(1), 18-22.

Crawford, C. (2003). *The art of interactive design*. San Francisco, CA: No Starch Press.

Dede, C., Ketelhut, D., & Ruess, K. (2006). Designing for motivation and usability in a museum-based multi-user virtual environment. Retrieved March 11, 2006, from http://www.gse.harvard.edu/~dedech/muvees/documents/AELppr.pdf

Dede, C., Nelson, B., Ketelhut, D. J., Clarke, J., & Bowman, C. (2004). *Design-based research strategies for studying situated learning in a multi-user virtual environment.* Paper presented at the 6th International Conference on Learning Sciences, Santa Monica, California.

Denis, G., & Jouvelot, P. (2005). *Motivation-driven educational game design: applying best practices to music education.* Paper presented at the 2005 ACM SIGCHI International Conference on Advances in Computer Entertainment Technology, Valencia, Spain.

Denzin, N., & Lincoln, Y. (Eds.). (2003). *The discipline and practice of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Denzin, N., & Lincoln, Y. (Eds.). (2008). *Collecting and interpreting qualitative materials* (2nd ed.). Los Angeles, CA: Sage Publications.

Dickey, M. D. (2005). Three-dimensional virtual worlds and distance learning: Two case studies of Active Worlds as a medium for distance education. *British Journal of Educational Technology, 36*(3), 439-451.

Dickey, M. D. (2006). *"Ninja looting" for instructional design: The design challenges of creating a game-based learning environment.* Paper presented at the ACM SIGGRAPH 2006 Conference, Boston, Massachusetts.

Dondlinger, M. J. (2007). Educational video game design: A review of the literature [Electronic Version]. *Journal of Applied Educational Technology*, *4*, 1-11. Retrieved July 19, 2007 from http://www.eduquery.com/jaet/index.htm.

Duffy, T. M., & Cunningham, D. J. (1996). Constructivism: Implications for the design and delivery of instruction. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology*. NY: Macmillan.

El-Nasr, M. S., & Smith, B. K. (2006). Learning through game modding. *ACM Computers in Entertainment, 4*(1), 7.

Fisch, S. M. (2005). *Making educational computer games "educational."* Paper presented at the 2005 Conference on Interaction Design and Children, Boulder, Colorado.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston: Pearson Longman.

Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. New York: Palgrave MacMillan.

Gibson, J. J. (1977). The theory of affordances. In R. Shaw & J. Bransford (Eds.), *Perceiving, acting, and knowing: Toward on ecological psychology* (pp. 67-82). Hillsdale, NJ: Erlbaum and Associates.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine Publication Company.

Grabinger, R. S. (1996). Rich environments for active learning. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 665-692). New York: Macmillan.

Guba, E. G., & Lincoln, Y. S. (Eds.). (1989). *Fourth generation evaluation* (2nd ed.). Newbury Park, CA: Sage Publications.

Halverson, R., Shaffer, D., Squire, K., & Steinkuehler, C. (2006). *Theorizing games in/and education.* Paper presented at the 7th International Conference on Learning Sciences, Bloomington, Indiana.

Hassenplug, C. A., & Harnish, D. (1998). The nature and importance of interaction in distance education credit classes at technical institutes. *Community College Journal of Research and Practice, 22*(6), 591-606.

Hays, R. T. (2005). *The effectiveness of instructional games: A literature review and discussion* (Technical Report No. 2005-004). Orlando, FL: Naval Air Warfare Center Training Systems Division.

Heinich, R., Molenda, M., Russell, J., & Smaldino, S. (1999). *Instructional media and technologies for learning* (6th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Hickey, D., Zuiker, S. J., Taasoobshirazi, G., Shafer, N. J., & Michael, M. A. (2006). Balancing varied assessment functions to attain systemic validity: Three is the majic number. *Studies in Educational Evaluation, 32*, 180-201.

Hoachlander, G., Sikora, A. C., & Horn, L. (2003). Community college students: Goals, academic preparations, and outcomes. *Education Statistics Quarterly, 5*(2).

Hollis, M. (1994). *The philosophy of social science: An introduction*. Cambridge, UK: Cambridge University Press.

Jenkins, H., Klopfer, E., Squire, K., & Tan, P. (2003). Entering the education arcade. *Computers in Entertainment, 1*(1), 17.

Jennings, M. (2001). *Best practices in corporate training and the role of aesthetics: Interviews with eight experts.* Paper presented at the 2001 ACM SIGCPR Conference on Computer Personnel Research, San Diego, California, United States.

Johnson, D. W., & Johnson, R. T. (1994). *Learning together and alone: Cooperative, competitive, and individualistic learning* (4th ed.). Needham Heights, MA: Allyn and Bacon.

Jonassen, D. H. (1999). Designing constructivist learning environments. In C. M. Reigeluth (Ed.), *Instructional design theories and models: A new paradigm of instructional theory* (Vol. 2, pp. 215-239). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Jung, C. (1958). *Psyche and symbol*. Princeton, NJ: Princeton University Press.

Juniewicz, K. (2003). Student portfolios with a purpose. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 77*(Nov-Dec), 73.

Kelly, H. (2005). Games, cookies, and the future of education. *Issues in Science & Technology, 21*(4), 33-40.

Kirkpatrick, D. L. (1994). *Evaluating training programs: The four levels*. San Francisco: Berrett-Koehler.

Kirwan, B., & Ainsworth, L. K. (1992). *A guide to task analysis*. London: Taylor & Francis.

Klopfer, E., & Yoon, S. (2005). Developing games and simulations for today and tomorrow's tech savvy youth. *Tech Trends, 49*(3), 33-41.

Koljatic, M., & Kuh, G. (2001). A longitudinal assessment of college student engagement in good practices in undergraduate education. *Higher Education, 42*, 351-337.

Kolodner, J. (2002). Facilitating the learning of design practices: Lessons learned from an inquiry into science education. *Journal of Industrial Teacher Education, 39*(3), 9-40.

Kuh, G., Pace, C. R., & Vesper, N. (1997). The development of process indicators to estimate student gains associated with good practices in undergraduate education. *Research in Higher Education, 38*(4), 435-454.

Ladd, H. F. (2008). Rethinking the way we hold schools accountable [Electronic Version]. *Education Week*. Retrieved January 22, 2008 from http://www.edweek.org/ew/articles/2008/01/23/20ladd.h27.html.

Lauzon, A. C. (1999). Situating cognition and crossing borders: Resisting the hegemony of mediated education. *British Journal of Educational Technology, 30*(3), 261.

Lave, J. (1988). *Cognition in practice: Mind, mathematics, and culture in everyday life*. Cambridge, UK: Cambridge University Press.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

Lincoln, C. (2009). Achieving the community-college dream [Electronic Version]. *Change*. Retrieved January 20, 2009 from http://www.changemag.org/Archives/Back%20Issues/January-February%202009/full-achieving-dream.html.

Liu, M. (2003). Enhancing learners' cognitive skills through multimedia design. *Interactive Learning Environments, 11*(1), 23-39.

Lunce, L. (2006). Simulations: Bringing the benefits of situated learning to the traditional classroom. *Journal of Applied Educational Technology, 3*(1), 37-45.

Martin, A., & Chatfield, T. (2006). Alternate Reality Games White Paper - IGDA ARG SIG. Mt. Royal, New Jersey: International Game Developers Association.

McHugh Engstrom, C., & Tinto, V. (2008). Learning better together: The impact of learning communities on the persistence of low-income students. *Opportunity Matters: A Journal of Research Informing Educational Opportunity Practice and Programs, 1*(1), 5-21.

McLester, S. (2005). Student gamecraft. *Technology & Learning, 26*(4), 20.

Merriam, S. B. (1988). *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass.

Miles, M., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Nelson, B., Ketelhut, D. J., Clarke, J., Bowman, C., & Dede, C. (2005). Design-based research strategies for developing a scientific inquiry curriculum in a multi-user virtual environment. *Educational Technology, 45*(1), 21-28.

Orey, M. A., & Nelson, W. A. (1997). The impact of situated cognition: Instructional design paradigms in transition. In C. R. Dill & A. J. Romiszowski (Eds.), *Instructional Design Paradigms*. Englewood Cliffs, NJ: Educational Technology Publications.

Pearce, C. (1997). *The interactive book.* Indianapolis: Macmillan.

Peter D. Hart Research Associates. (2008). *How should colleges assess and improve student learning: A survey of employers conducted on behalf of the Association of American Colleges and Universities*. Washington, D.C.: Association of American Colleges and Universities.

Pink, D. H. (2006). *A whole new mind: Why right-brainers will rule the future*. New York: Riverhead Books.

Prensky, M. (2006). *Don't bother me mom--I'm learning*. St. Paul, MN: Paragon House.

Pullman, G. (2002). Electronic portfolios revisited: The efolios project. *Computers and Composition, 19*(2), 151.

Richland College. (2008). Thunderdocuments. Retrieved February 15, 2009, from http://www.richlandcollege.edu/thunderdoc/

Richland College. (2009a). Campus profile. Retrieved February 15, 2009, from http://www.richlandcollege.edu/about/profile.php

Richland College. (2009b). Learning communities. Retrieved January 10, 2009, from http://www.richlandcollege.edu/schedules/spring/LC.php

Robertson, J., & Good, J. (2005). Story creation in virtual game worlds. *Communications of the ACM, 48*(1), 61-65.

Robertson, J., Good, J., Keeker, K., Pagulayan, R., Sykes, J., & Lazzaro, N. (2004). *Children's narrative development through computer game authoring: The untapped world of video games.* Paper presented at the 2004 Conference on Interaction Design and Children: Building a Community, Vienna, Austria.

Safflund Institute. (2007). *Information technology workforce skills study*. Boston, MA: Boston Area Advanced Technological Education Connections.

Salen, K., & Zimmerman, E. (2004). *Rules of play: Game design fundamentals*. Cambridge, Mass.: MIT Press.

Salzman, M. C., Dede, C., & Loftin, R. B. (1999). *VR's frames of reference: A visualization technique for mastering abstract multidimensional information.* Paper presented at the SIGCHI Conference on Human Factors in Computing Systems, Pittsburgh, Pennsylvania, United States.

Salzman, M. C., Loftin, R. B., Dede, C., & McGlynn, D. (1996). *ScienceSpace: Lessons for designing immersive virtual realities.* Paper presented at the Conference on Human Factors in Computing Systems, Vancouver, British Columbia, Canada.

Savery, J. R., & Duffy, T. M. (1995). Problem based learning: An instructional model and its constructivist framework. *Educational Technology, 35*, 31-38.

Schrier, K. (2006). *Using augmented reality games to teach 21st century skills.* Paper presented at the ACM SIGGRAPH 2006 Conference, Boston, Massachusetts.

Secretary's Commission on Achieving Necessary Skills. (1991). *What work requires of schools: A SCANS report for America*. Retrieved November 10, 2007. from http://wdr.doleta.gov/SCANS/.

Segers, M., Gijbels, D., & Thurlings, M. (2008). The relationship between students' perceptions of portfolio assessment practice and their approaches to learning. *Educational Studies, 34*(1), 35.

Southern Association of Colleges and Schools. (2007). *Principles of accreditation: Foundation for quality enhancement*. Retrieved January 29, 2008. from http://www.sacscoc.org/principles.asp.

Squire, K. (2006). From content to context: Videogames as designed experience. *Educational Researcher, 35*(8), 19-29.

Squire, K., Barnett, M., Grant, J. M., & Higginbotham, T. (2004). *Electromagnetism Supercharged!: Learning physics with digital simulation games.* Paper presented at the 6th International Conference on Learning Sciences, Santa Monica, California.

Squire, K., Giovanetto, L., Devane, B., & Durga, S. (2005). From users to designers: Building a self-organizing game-based learning environment. *Tech Trends, 49*(5), 34-42, 74.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Steiner, B., Kaplan, N., & Moulthrop, S. (2006). *When play works: Turning game-playing into learning.* Paper presented at the 2006 Conference on Interaction Design and Children, Tampere, Finland.

Strauss, A. L., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.

Strickland, E. (2007, July 10). Play peak oil before you live it. Retrieved March 8, 2008, 2008, from http://www.salon.com/tech/feature/2007/07/10/alternative_reality_games/

Sturtz, A. J. (2006). The multiple dimensions of student swirl. *Journal of Applied Research in the Community College, 13*(2), 151-158.

Swartout, W., & van Lent, M. (2003). Making a game of system design. *Communications of the ACM, 46*(7), 32-39.

Texas Higher Education Coordinating Board. (1999). Core curriculum: Assumptions and defining characteristics. Retrieved January 17, 2008, from http://www.thecb.state.tx.us/AAR/UndergraduateEd/fos_assumpdef.cfm

The Safflund Institute. (2007). *Information technology workforce skills study*. Boston, MA: Boston Area Advanced Technological Education Connections.

U.S. Department of Education. (2002). Strategic Plan, 2002-2007. Retrieved March 10, 2004, from http://www.ed.gov/about/reports/strat/plan2002-07/index.html

United Nations. (2005). UN Millenium Development Goals. Retrieved November 10, 2007, 2007, from http://www.un.org/millenniumgoals/

Van Tartwijk, J., Driessen, E., Van Der Vleuten, C., & Stokking, K. (2007). Factors influencing the successful introduction of portfolios. *Quality in Higher Education, 13*(1), 69.

Vanderbilt Cognition and Technology Group. (1990). Anchored instruction and its relationship to situated cognition. *Educational Researcher, 19*(6), 2-10.

Vanderbilt Cognition and Technology Group. (1993). Anchored instruction and situated cognition revisited. *Educational Technology, 33*(3), 52-70.

Waraich, A. (2004). *Using narrative as a motivating device to teach binary arithmetic and logic gates.* Paper presented at the 9th annual SIGCSE Conference on Innovation and Technology in Computer Science Education, Leeds, United Kingdom.

Warren, S. J. (2006, April 7-11, 2006). *Using digital learning environment scaffolds to improve student writing in a PBL-style instructional space.* Paper presented at the American Educational Research Association Annual Meeting, San Francisco, CA.

Warren, S. J., Barab, S. A., & Dondlinger, M. J. (2008). A MUVE towards PBL writing: Effects of a digital learning environment designed to improve elementary student writing. *Journal of Research on Technology in Education, 41*(1), 113-140.

Warren, S. J., & Dondlinger, M. J. (2008a). *Data-driven decision-making about curricular redesign: Using PBL and game design to transform instruction in a large enrollment course*. Paper presented at the Annual Meeting of the American Educational Research Association, New York, NY.

Warren, S. J., & Dondlinger, M. J. (2008b). Issues with designing games for learning In R. Ferdig (Ed.), *The handbook of research on effective electronic gaming in education*. Hershey, PA: IGI Global.

Warren, S. J., & Dondlinger, M. J. (2008c). *Objective achievement in a PBL course: Findings from a study on the first iteration of a problem-based learning course game*. Paper presented at the Association for Educational Communications and Technology Annual Convention, Orlando, FL.

Warren, S. J., Dondlinger, M. J., & McLeod, J. (2008). *Power, play and PBL in postsecondary learning: Leveraging design models, emerging technologies, and game elements to transform large group instruction*. Paper presented at the Annual Meeting of the American Educational Research Association, New York, NY.

Warren, S. J., Dondlinger, M. J., & Whitworth, C. (2007). *Distributed online multimedia learning games: The challenge of instructional design in closed systems*. Paper presented at the Association for Educational Communications and Technologies, Anaheim CA.

Warren, S. J., Stein, R., Dondlinger, M. J., & Barab, S. A. (2009). A look inside a MUVE design process: Blending instructional design and game principles to target writing skills. *Journal of Educational Computing Research, 40*(3).

Wasley, P. (2008). Tests aren't best way to evaluate graduates' skills, business leaders say in survey [Electronic Version]. *The Chronicle of Higher Education*. Retrieved January 23, 2008 from http://chronicle.com/daily/2008/01/1340n.htm.

Yin, R. K. (1993). *Application of case-study research*. Newbury Park, CA: Sage.

Yin, R. K. (2003). *Case Study Research: Design and Methods* (3rd ed. Vol. 5). Thousand Oaks, CA: Sage.

Zagal, J. P., Nussbaum, M., & Rosas, R. (2000). A model to support the design of multiplayer games. *Presence, 9*(5), 448-462.