

## GAMIFYING A COURSE TO TEACH GAMES AND SIMULATIONS FOR LEARNING

Susan L. Stansberry & Scott M. Haselwood, *Oklahoma State University*

This design case includes the challenges, considerations, and decisions associated with the design, development, and delivery of a master's level educational technology course on teaching and learning with games and simulations. A master's level course, Digital Games and Simulations in the Classroom, faced redesign in order to add a gamification component to be modeled through 3D GameLab and Shivtr. The design decisions made and resulting issues are detailed in this paper. This paper aims to reveal benefits in two key areas: (a) helping a population of primarily non-gamer educational technology graduate students see games and simulations as viable resources for improving learning and (b) modeling gamification as a means to help instructors use gamification as their own instructional strategy.

**Susan L. Stansberry** is an Associate Professor of Educational Technology, T.E.C.H. Playground Director, and Head of the School of Educational Studies at Oklahoma State University. Her research interests include learning design and technology, creativity, and curiosity.

**Scott M. Haselwood** is a candidate in the Ph.D. in Education/ Educational Technology program at Oklahoma State University and the Director Instructional Technology at the University of Science & Arts of Oklahoma. His research interests include gamification, professional development, and social media.

Copyright © 2017 by the International Journal of Designs for Learning, a publication of the Association of Educational Communications and Technology. (AECT). Permission to make digital or hard copies of portions of this work for personal or classroom use is granted without fee provided that the copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page in print or the first screen in digital media. Copyrights for components of this work owned by others than IJDL or AECT must be honored. Abstracting with credit is permitted.

<https://doi.org/10.14434/ijdl.v8i2.20897>

### THE DESIGN CONTEXT

A design case is "a description of a real artifact or experience that has been intentionally designed" (Boling, 2010, p. 2). This design case includes the challenges, considerations, and decisions associated with the design, development, and delivery of a master's level educational technology course on teaching and learning with games and simulations.

As an Associate Professor of Educational Technology, I am continually looking for ways to improve our curriculum and student experiences. Beginning in 2006 and 2007, I noticed the conversations at national conferences regarding games and simulations for learning were growing. The majority of the conversations centered on game design for learning and evaluation of games. While that's fascinating, I was more drawn to the idea of taking teachers who would largely be considered *non-gamers* (those who do not play video games) and equipping them to connect with their students, largely considered to be *gamers* (those who play video games), by integrating commercial off the shelf (COTS) games and simulations into classroom learning experiences. This led to collaboration on a book chapter, *Video Games and Teacher Development: Bridging the Gap in the Classroom*, the purpose of which was to provide teachers with research-based strategies for integrating COTS games into their classroom without the need to become full-fledged *gamers* themselves (Simpson & Stansberry, 2008). Based on this research, I created a four-week, masters level online course for students in our educational technology program.

The initial course design consisted of five instructional modules: (a) Introduction to Video Games and Simulations in the Classroom, (b) Digital Game Based Learning, (c) Let's Play!, (d) Anchoring COTS Games to Standards, and (e) Designing Instruction and Assessing Learning, reflecting game-based learning literature I had studied. Course assignments included participation in asynchronous discussion, maintaining a gaming journal in which students recorded their experiences playing various educational games, analyzing particular games for evidence of a match to content and process standards, and creating a unit of instruction integrating a COTS game into their classroom. Even though I designed the

course, due to a full schedule, I handed it over to another faculty member to teach in 2008, and then I was able to teach this course in 2011 but the only change I made at that time was updating the list of educational games and simulations for students to choose from. Another faculty member taught this course in 2013, and then I again was able to teach it in 2015.

Changes in technologies, research, and focus in the field had evolved enough from 2008 to 2015 to merit a thorough redesign of the course, and herein lies the design challenge I faced: redesigning the course to maintain the original objective for the course—to provide research-based strategies for integrating games and simulations into learning without the need to become full-fledged *gamers* themselves—but also to increase their knowledge and skills related to gamifying curriculum. Due to a broadened focus on student recruitment for the M.S. in Educational Technology program, the population taking this course also had evolved from P12, in-service teachers to graduate students across education, business and industry who were interested in improving student learning through technology integration.

The purpose of this design case is to share our decision making and the users' experiences.

## DESIGN TEAM WORK

Because of the addition of gamification to the curriculum, I sought expertise co-author Scott Haselwood, one of our Ph.D. students in educational technology. Scott had gamified his calculus class as a high school teacher. His

experience also includes designing a gamified professional development experience for university students and faculty members.

We used a shared document in Google Docs to collaboratively plan, pose challenges, and work out solutions. This document now stands as a running record of how we made decisions.

The students in the course could also be considered an important element of the design team. As the instructor, I was transparent with students regarding the purpose of gamifying the course and design decisions made, the students felt free to make suggestions of design changes. For example, the course was originally set up in a way that Level 2 could not be accessed until a certain date even though the student had achieved all points for Level 1. On the second day of the course, students began contacting me saying they could not wait to move forward and wanted Level 2 opened immediately. [Kevin] posted to the discussion forum, "I understand that you probably don't want the class as a group to get too strung out in terms of completion, but any hint as to when we can charge ahead into the Voyager campaign? Quite eager, & right now I have the time to devote to it." As a result, I removed all date-specific timelines and allowed the students to play at their own pace.

## DESIGN INTERVENTION AND DEVELOPMENT

Vocabulary is an important aspect of gamification, the use of game-play mechanics for non-game applications (Deterding, et al, 2011). What is typically called an "assignment" is

SECTION 1: EMPOWERED LEARNERS		
PRINCIPLE	EXPLANATION	ADDRESSED IN DESIGN
<b>CO-DESIGN</b>	Learners feel like active agents (producers) not just passive recipients (consumers).	Students were given choice in selection of quests and could design their own path through the course.
<b>CUSTOMIZE</b>	Learners need to make decisions about their own learning but also be encouraged to try new types of learning.	Different quests had different learning activities. For example, in one quest students would read and discuss, but in others they were required to create an original artifact.
<b>IDENTITY</b>	Investing in an identity they value helps the learner commit to deep learning.	In order to have a deep understanding of learning within a game or gamified scenario, it was necessary for students to take on a gamer identity and immerse themselves in a game environment; hence, the use of 3D GameLab rather than a regular learning management system.
<b>MANIPULATION</b>	Perception and action are deeply inter-connected. When learners are manipulating something in a different space (the Internet, for example), they feel as if their minds and bodies have stretched into that new space.	Students had more power over the course as they were able to select quests and level up to the goal they set independently.

**TABLE 1.** Critical principles of empowered learners in good computer and video games (Gee, 2005) and design decisions they influenced.

SECTION 2: PROBLEM SOLVING		
PRINCIPLE	EXPLANATION	ADDRESSED IN DESIGN
<b>WELL-ORDERED PROBLEMS</b>	The problems learners face early on are crucial and should be well-designed to lead them to solutions that work well, not just on these problems, but as aspects of the solutions to later, harder problems.	Less complex problems were presented in earlier quests.
<b>PLEASANTLY FRUSTRATING</b>	Learners engage best when faced with challenges that feel hard but are doable.	The 3D GameLab system featured a progress tracker so each student could easily see their points and levels achieved.
<b>CYCLES OF EXPERTISE</b>	Learners gain expertise by practicing skills until they are nearly automatic, then having to rethink and learn new skills when the original skills fail.	Players felt a sense of mastery as they completed a quest or level. The asynchronous discussion board allowed individuals to share their gained expertise with other learners.
<b>INFORMATION "ON DEMAND" AND "JUST IN TIME"</b>	Learners need information "just in time" (when they can put it to use) and "on demand" (when they feel they need it).	Information needed for each quest was embedded within the quest itself rather than in a stand-alone syllabus-type document.
<b>FISH TANKS</b>	Metaphorically, a fish tank is a simplified system for learning, stressing a few key variables and their interactions. This keeps learners from being overwhelmed by a complex system in the beginning.	Having learners engage in game play for the purpose of learning how games and simulations can be used to increase learning gave a simplified, authentic system in which to explore.
<b>SANDBOXES</b>	A sandbox is a situation learners are put into that feels like the real thing but the risks and dangers are greatly lessened.	By transparently sharing design decisions with students within a gamified course gave them a sandbox experience before they began the complex work of gamifying their own curriculum.
<b>SKILLS AS STRATEGIES</b>	People learn and practice skills best when they see a set of related skills as a strategy to accomplish goals they want to accomplish.	The skills of teaching with games and gamification were learned within an actual gamified course.

**TABLE 2.** Critical principles of problem solving in good computer and video games (Gee, 2005) and design decisions they influence.

deemed a "quest" in the gamified experience. Instead of "modules," students completed "levels." Rather than "earning grades," students "leveled up." Engaging learners is the purpose of gamification. Gamifying this course would allow us to model the practice as well as engage students thoroughly in game-play mechanics as they gained knowledge and skills in teaching with games and simulations. In a study of 2500 Americans, Carstens & Beck (2005) found that gamers "showed a range of different opinions and behaviors compared to their non-gamer brethren" (p. 23). Since the majority of students taking the class would be classified as non-gamers, it was critical for us to design the course with both perspectives in mind.

Gee (2005) identified critical principles of learning in good computer and video games and organized these principles into three sections: 1) Empowered Learners, 2) Problem Solving, and 3) Understanding. Tables 1, 2 and 3 outline the principles within each section, offer a description of the principle, and explain how our design addressed each

principle. Following each table we share challenges, failures, and triumphs associated with our design process and the final product.

### **Empowered Learners: Challenges and Failures**

Our biggest challenge related to empowering learners was creating a learning environment in which a non-gamer would be as comfortable in as a gamer. In a poll at the beginning of the course, 75% of students chose "board games" as their favorite type of game to play, while 25% chose "video games." The students also labelled themselves as *gamers* and *non-gamers* through discussion forum posts, such as, "I am not a big gamer." This type of information, as well as informal conversations with students, helped us determine that most students taking the course would be considered non-gamers. Students in the class ranged from experienced, avid gamers to those who did not even enjoy playing traditional, non-digital games. Additionally, some were P12 teachers, while others worked in business, industry

SECTION 3: UNDERSTANDING		
PRINCIPLE	EXPLANATION	ADDRESSED IN DESIGN
<b>SYSTEM THINKING</b>	People learn skills, strategies, and ideas best when they see how they fit into an overall larger system to which they give meaning.	In order to understand the process of teaching with games and gamifying their own curriculum, students needed to experience it as a learner.
<b>MEANING AS ACTION IMAGE</b>	Humans do not usually think through general definitions and logical principles. Rather, they think through experiences they have had. Words and concepts have their deepest meanings when they are clearly tied to action in the world.	The students needed to experience game play in formal learning before they would be able to become a designer of it.

**TABLE 3.** Critical principles of understanding in good computer and video games (Gee, 2005) and design decisions they influenced.

or higher education. Being asked to choose your own path is typical in a digital game, but it is not typical in the average masters-level course. Therefore, we anticipated the gamers would have a higher comfort level with quest-based learning than the non-gamers. We needed to create enough quests so students would be empowered to choose their own path, but no matter which path they chose, we would be confident they had learned the content. In the development of the quests, we made sure they would still have the full experience of that section of the course even if they chose not to complete three of the quests. We felt triumph in the fact that all students ended up choosing to complete all of the quests. If we were to do this again, we would still create more quests than required for mastery but hope we would see the same result of the students choosing to complete all quests.

This process of designing more learning experiences than we had anticipated using was familiar to Scott, who had gamified his calculus curriculum while teaching high school. However, since I was more familiar with traditional instructional design in which all students encountered all content in a linear fashion, I felt this experience had stretched my role as an instructional designer, allowing me to step out of a comfort zone and see the result of engaged, empowered learners.

### **Problem Solving: Challenges and Failures**

The category of problem solving may be where we encountered failure most often. Our goal of transparency in how the course was gamified and why it was designed as a model for students who gamified their own curriculum seemed to overshadow the course content at times, creating confusion for some of the students. Ideally, the students would be focused primarily on course content but have an awareness of the elements of gamification that went into their instructional design. Since 3D GameLab and Shivtr were unfamiliar tools and had the look and feel of a digital game, some students focused more on navigating the environment and processing the flow required to use both tools rather

than on the course content. Ideally, we only would use one tool. The choice to use Shivtr was made to facilitate the type of communication and collaboration among students that 3D GameLab did not offer. In the future, we hope to employ an integrated tool that allows for participation in both quests and communication/collaboration in order to alleviate student confusion. The confusion of having two platforms was very evident as some students created two completely different identities. This created difficulty for us, tracking a particular student across two platforms with two identities.

Creating avatar identities was the first quest students encountered, because we felt that this was a very low-risk activity that gave them the opportunity to personalize their experience. Giving them an early success in the class helped students build their own cycles of expertise as they progressed through the class. In an effort to draw out each students' expertise, the instructor purposefully posted messages like, "[Kathy] created an amazing avatar! Ask her how she did it!", or "Kudos to [Bob] for earning 'The Thinker' badge!" This actually made some of the students uncomfortable at first because their other classes typically do not encourage this type of sharing and co-learning. As the course progressed, however, they became comfortable tapping into each other's areas of expertise. Collaboration among students was an important aspect of this class, and social construction of knowledge was particularly noticeable during the quests involving game selection and evaluation. The P12 teachers were quick to jump in and share ideas of how a particular selection would be used in their classroom. There were fewer students coming from business and industry, so the instructor's challenge was to make sure the sharing of ideas happened across all student conversations. One student in particular, who works in business, struggled to understand that the process of gamification was not just for formal learning.

An important principle of good games is that the experience should be pleasantly frustrating. We found this to be a challenge in the design process. Knowing our students would be a mix of gamers and non-gamers from education, business,

The screenshot displays the 'Quest Details' page in 3D GameLab. On the left, a sidebar shows the course 'EDTC 5303 Digital Games and Simulations' with a 'START' button. Below this are statistics for 'Quests' (0), 'Rewards' (0), 'Group' (4), 'Discussion' (4), and 'Announcements' (4). Navigation buttons include 'Group Manager', 'Quest Builder', 'Reward Builder', and 'Quest Approver (7)'. The main content area features a table with columns: Name, XP, Avg Time, Rating, Category, and Due Date. The table lists Quest 5: '05 What do scholars say?' with 100 XP, 87 mins, a 4-star rating, and the category 'Wanderer'. Below the table, there are buttons for 'Report', 'Edit Quest', and 'Delete Quest'. The quest description provides access to three articles from the OSU Library. The 'Submission Details' section instructs students to discuss the articles in the 'Wanderer Discussion Forum' and to provide URLs for their responses.

Name	XP	Avg Time	Rating	Category	Due Date
05 What do scholars say?	100	87 mins	★★★★	Wanderer	No end date

FIGURE 1. Screen shot of details of Quest 5 in the course in 3D GameLab. Used with permission from <http://3dgamefab.com>.

and industry, we tried to predict at which point different groups might become too frustrated. We also tried to make sure the necessary on-demand, or just-in-time, information was provided in all quests, so that they truly could move through the course along their own chosen path. These efforts resulted in somewhat of a failure, as evidenced by the number of questions we received from students confused about what to do during a quest or after completing a quest. For example, [Robin] posted to the discussion forum, "When I post to complete a quest, like I just did for the Jane McGonigal TED talk, is it normal that I then have no quests?" We believe a closer edit of each quest to make sure all necessary information is embedded will solve this problem.

### Understanding: Challenges and Failures

To address the principle of understanding, we challenged ourselves to balance the content of the course with the process of game play. We firmly believe that in order for instructors to understand the process of teaching with games and gamify their own curriculum, they really need to experience a learner perspective. In this effort, we felt triumphant as students in the course did learn about game-based learning and gamification within the experience of

that instructional design and strategy, which is evidenced by the course evaluations (Table 4).

In order to immerse non-gamers in a gaming environment, our first challenge was to select a platform to give them the feel of game play. We explored both Classcraft (<http://classcraft.com>) and 3D GameLab (now *Rezzly: Heroic Learning*; <http://rezzly.com>), but ended up choosing 3D GameLab; Classcraft was designed for use in a P12 classroom setting, and we felt some of our students would not feel comfortable with this environment since they work in business and industry.

The downside to 3D GameLab was that it did not include a tool for asynchronous communication, which we desired for journaling. We added links to Shivtr (<http://shivtr.com>) to host this communication. We used 3D GameLab to track student experience points, quests, badges, and rewards. Figure 1 shows an example of a quest in the course using 3D GameLab, and Figure 2 shows the associated discussion in Shivtr.

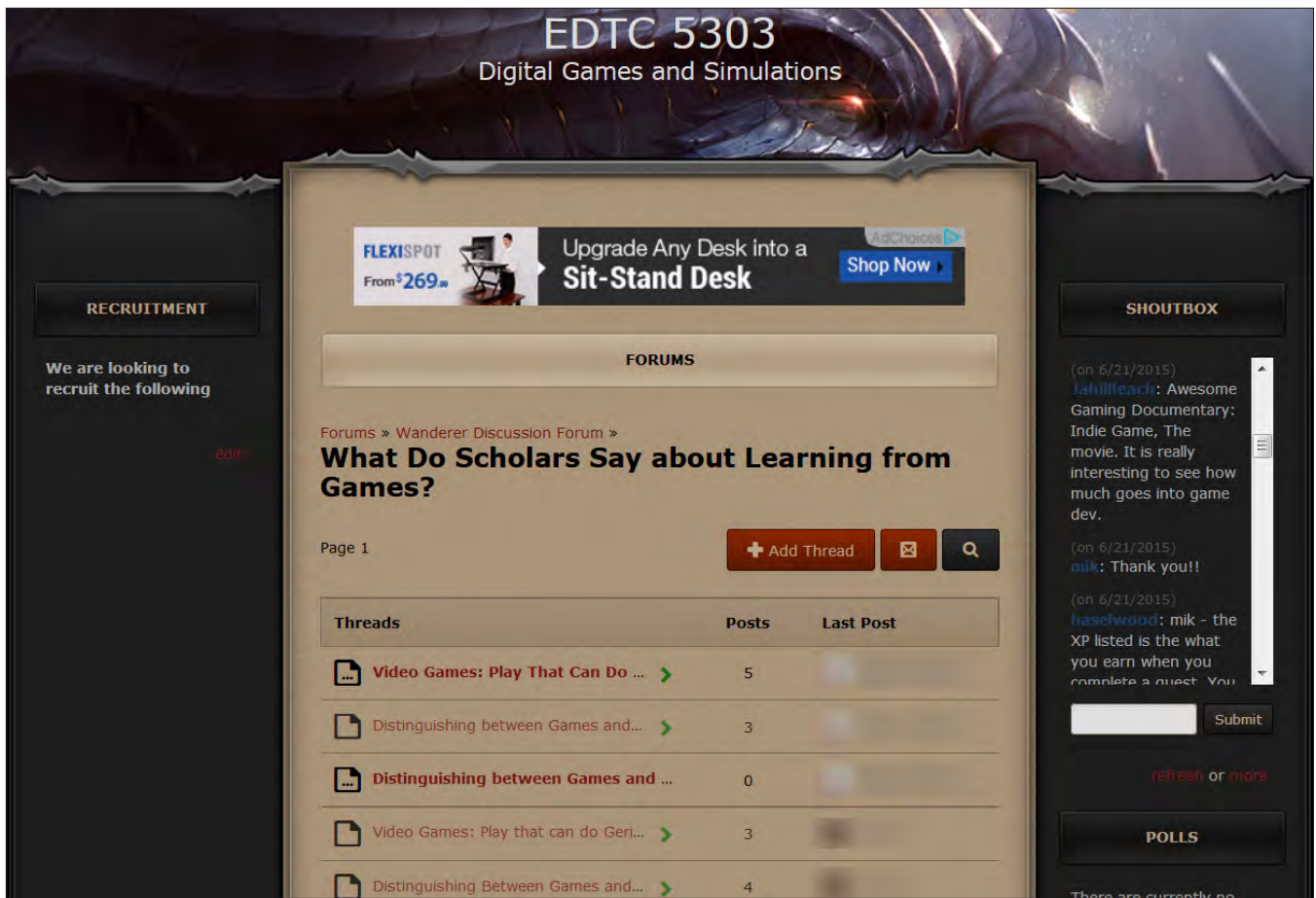




FIGURE 2. Screen shot of discussion in Shivtr associated with Quest 5. Used with permission from <http://shivtr.co>.


	<p>Mad Men Yourself  <a href="http://www.amc.com/shows/mad-men/exclusives">http://www.amc.com/shows/mad-men/exclusives</a>          Minion Maker <a href="http://minionslovebananas.com/minion-maker/">http://minionslovebananas.com/minion-maker/</a>          Voki <a href="http://voki.com/">http://voki.com/</a>          Marvel Superhero Avatar Creator  <a href="http://marvel.com/games/play/31/create_your_own_superhero">http://marvel.com/games/play/31/create_your_own_superhero</a></p>	
Submission Details (submission instructions)	Save your created avatar and upload it to your profile	
Tags	avatar	
Category	Wanderer	
Reward Structure	15 points achievement - Avatar possible teacher-given awards: most unique, closest to actual likeness, etc	
Quest 3: Jane McGonigal TED Talk?		
Due Date	June 10, 8am	
Overview of Concept	Games can make the world a better place and unleash creativity that we did not know existed. This TED Talk from Jane McGonigal shares a powerful vision for the future as we play more games.	

 Scott Haselwood  
May 15, 2015 Resolve


Einstein Award - Given for creative thinking

 Susan Stansberry  
May 25, 2015

I'd like to reward failure somehow -- something about growth from fail/try /fail/try again/succeed cycle

 Scott Haselwood  
May 25, 2015

me to - maybe we could have an award to give with persistence?

 Scott Haselwood  
May 27, 2015 Resolve

We can award XP with each reward if we want to...


 Scott Haselwood  
May 15, 2015 Resolve

FIGURE 3. Example of shared decision-making processes in Google Docs.

The details for gamifying the course were collaboratively planned using the previously mentioned tools in Figures 3 and 4 and are explained below.

## QUESTS

We began designing quests from the course objectives and ended up with a total of 21 quests:

1. Syllabus for EDTC 5305 Digital Games and Simulations
2. Shivtr
3. Build Your Avatar
4. Jane's TED Talk
5. What Do Scholars Say?
6. Good Learning Principles in Games
7. Transforming Education with Video Games
8. What Social Media is Saying about Game-Based Learning
9. Common Sense Media for Game Selection and Evaluation
10. Educade for Game Selection and Evaluation
11. TeachThought for Game Selection and Evaluation
12. Graphite for Game Selection and Evaluation
13. Connecting Games and Learning Standards
14. What Social Media is Saying about Gamification
15. Connecting Standards to Games as a Voyager
16. Mind/Shift Games and Learning
17. Eight Core Drives of Gamification
18. Quest to Learn Schools
19. The Octalysis Model for Gamification
20. Social Media Conversations about Digital Games and Simulations
21. Create a Gamified Instructional Unit for Your Learners

Two additional quests were designed and added toward the end of the course when some of the students had completed all quests but requested additional ones just for fun. Scott had engaged these students to help design two new quests—*Around the World with Games* and *Everyday Gamification*—for the class to enjoy.

Each quest was given an icon indicative of the type of challenge involved. For example, quests 4 through 7 involved theory and research related to learning and games, so this icon was a compass. Quest three involved the identity principle, and the icon selected was a mirror.

In designing quests, we structured these around the following labels: title, due date, overview of concept, outcome, description (e.g., learning objectives, explanation, content, and resources), submission details, tags, category, and reward structure. Most quests were to be completed only once, but others (e.g., *Quest 7: Analysis and Quest Participate/Learn from Social Media* and *Quest 10: Use EduCade for Game Selection*) could be repeated as many times as a student wished. As each student completed quests and acquired experience points (XP), they would level up. The levels unlocked new

units of material for students, but also allowed them to visit previous quests if they chose to do so.

In our shared planning document in Google Docs, we collaboratively designed each quest. For example, Figure 3 shows the decision process we went through while constructing Quest 2: Create Your Avatar. Our comments to the right of the actual plan for Quest 2 reveal a negotiation about the types of things we wanted to encourage through rewards.

Another critical space for our design decisions was a shared spreadsheet (Figure 4) set up to plan quests, tasks, types of activities, due dates, estimated time to complete, and calculate associated points. The template for this document was provided by 3D GameLab.

## LEVELS

Once the quests were designed, we chunked them into meaningful levels. A player's completion of a set of quests is marked by a move to the next level. With this move, the player's identity actually changes:

- **VOYAGER** You have completed the first six quests! This earns you the rank of Voyager. A voyager is someone who may have started out just wandering around, but has now embarked upon a true journey. Try to earn the maximum amount of points on this journey as you enjoy the next quests! (0 XP points—this is where students started).
- **WANDERER** Just by accepting the mission of enrolling in this class, you have achieved the rank of Wanderer! A wanderer is someone who is driven by curiosity about what they may next encounter. Good luck as you embark on your next quests! (earned with 240 XP)
- **ADVENTURER** Congratulations! You have completed 12 quests to earn the rank of Adventurer, someone who undertakes daring enterprises! Good luck as you prepare to undertake additional quests! (earned after successfully completing 12 quests)
- **CONQUEROR** Congratulations! You have completed 16 quests so far! You are now set to vanquish any challenges left in your path! Finish strong! (earned after successfully completing 16 quests)

Students were required to achieve a specific number of points to move onto the next level. Each level was hidden from the students until they were eligible to move to it. As students moved from one level to the next, all of the older levels were still visible. They had the opportunity to go back to a previous level to work through a quest they may have chosen not to participate in. Each level had multiple quests for students to work on. Keeping choice as an option meant students did not have to master each quest. They only needed to achieve the experience points necessary to move to the next level.

B	C	D	E	F	G	H	I	J
<b>EDTC 5303 Digital Games and Simulations</b>								
Total available QUEST XP			2000		1	visible quests at startup		
Available Reward XP			175		4	Solo quests		
Total POSSIBLE XP			2175		12	Solo/Coop quests		
Winning condition XP			2000	(what is the maximum number of points students needs to "win" the case?)		0	Coop only quests	
Estimated time to complete total quests in group			1480.0	minutes		0	Event Related Quests	
			27					
Quest Name	Due Date	Estimat ed Time	XP	Prereq	Type	Topic/Task	Category	Type
<b>Wanderer</b>								
Syllabus		10	10	None	Solo	View Syllabus/Submit Answers	Wanderer	Read/Create
Avatar Builder	6/9/2015	30	25	Syllabus	Solo	Create an avatar image	Wanderer	Read/Create
Join Shivtr	6/9/2015	5	5	Syllabus	Solo	Join the 5303 shivtr community	Wanderer	
Jane McGonigal TED Talk	6/10/2015	35	50	Syllabus	Solo/coop	Blog the challenges/questions fromt this talk	Wanderer	Read/Create
What do scholars say?	6/10/2015	45	100	Syllabus	Solo/Coop	Read an article about games	Wanderer	Read/Create
Good Learning Principles in Games	6/11/2015	45	50	Syllabus	Solo/coop	Read Gee/Post to discussion	Wanderer	Read/Create
Totals		170	240					
<b>Voyager</b>								
Transforming Education with Video Games	6/15/2015	20	50	Wanderer	Solo/coop	Read an article and submit to forum	Voyager	Read/Post
Game-Based Learning on Social Media	6/19/2015	5	5	Wanderer	Solo	Read social media for gaming resources	Voyager	Read/Post
TeachThought for Game Selection and Evaluation	6/22/2015	45	60	Gaming on Social Media	Solo/coop	Play games	Voyager	Read/Play/Pos
Graphite for Game Selection and Evaluation	6/22/2015	45	60	Gaming on Social Media	Solo/coop	play games	Voyager	Read/Play/Post

FIGURE 4. Spreadsheet used to plan details of quests.

## ACHIEVEMENTS/REWARDS/BADGES

When a student earned enough points to move ahead to the next level (an achievement), the system notified them by email, and their profile at the top of every page indicated which level they had achieved. When “awarded,” “rewards,” and “badges” icons appeared in the students’ individual profiles, the system also notified them by email.

Badges were triggered automatically at specific milestones for students as they moved through the different quests. Badges were set up to recognize completion of specific milestones that were not quest-dependent. For example, the first level would not be completed until six quests had been achieved, but we wanted to motivate the students early in the course as they first created an avatar, earning their “Doppleganger” badge. Examples of badges available to earn included:

- **THE DOPPLEGANGER** You created and uploaded an avatar of yourself. Let the fun begin!
- **I’M IN...** Congratulations you are signed up and ready to learn about games—get ready to have a most intriguing time!
- **GETTING IT DONE** You have finished the second level! You are on your way to becoming a games expert!

- **WELCOME TO THE GAMES!** You have completed your first two games quests—keep going! What else can you learn?
- **GAMER** You have completed Level 3! Great work!

Rewards, as opposed to badges, were given by the instructor as an encouragement and for recognition. Examples of rewards given include:

- **THE THINKER** You have demonstrated deep thinking skills in the Discussion Forum. Einstein deep. Congratulations!
- **YOU ARE UNIQUE—JUST LIKE EVERYBODY ELSE** You have created the most unique avatar! Congratulations!
- **ALLOW MYSELF TO INTRODUCE MYSELF** Congratulations—you have created an avatar that most resembles YOU!
- **SHERLOCK HOLMES** Be a super-sleuth and find something that needs fixing in EDTC 5303. And, thanks for your help... in advance.
- **YOU ARE A POSTER** You have been active in the forums! Good Job! Keep it up!
- **CONNECTIONS** You make great connections between ideas! Way to go!
- **DETECTIVE** Good job of problem solving!
- **T-SHIRT** Your ideas are so great they should be printed on t-shirts!



- **LEADER OF THE PACK** Thank you for stepping up as a leader in this class!
- **GROWTH** I'm seeing growth in your ideas!
- **ENCOURAGER** You bring a bright and encouraging spirit to this class!
- **STRETCH ARMSTRONG** You do a great job of stretching your own thinking as well as others' thinking!
- **BRILLIANT IDEA** What a brilliant idea you shared!
- **EXTRA GAME REVIEW** This badge is to balance out the extra game reviews you may have done but submitted all in one post, so the points are incorrect.
- **THE QUESTBUILDER** Congratulations on earning 700 XP!! You can now design and submit a quest for the entire group! Is there something that you want to know more about? Is there something that you read that we need

to further investigate? Create your quest and submit for approval!

Using levels, badges, and rewards to indicate each students' unique purpose offered opportunities to visually track their completion of quests (levels), trigger automatic motivation at particular milestones (badges), and allow instructors to specifically encourage individual students at selected times (rewards).

## EVALUATION

The course evaluation form was created based on Gee's (2005) critical principles of learning in good computer and video games in order to gather data based on the original design frame. Table 4 offers user responses to the course evaluation items.

EVALUATION QUESTION	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
I felt like an active agent (producer) not just a passive recipient (consumer) in this class.			3	6
In this class I was able to learn in ways I'm used to and to try new ways of learning without fear.			1	8
The activities and ways of knowing in this course allowed me to see myself as someone who uses games and/or gamification in instruction.			4	5
As a result of this class, I feel more expanded and empowered to use games and gamification as tools to extend learning effectiveness.			4	5
The problems I needed to solve in this course were spaced appropriately (easier problems at the beginning, harder toward the end).			2	7
This course made me feel pleasantly frustrated in the sense of being at the outer edge of, but within, my regime of competence.			2	7
Each new level in this course forced me to open up my routinized skills to reflection, to learn new things, and then to integrate old and new knowledge.			3	6
In this course I received information just in time (when I could put it to use) and on demand (when I felt I needed it).			5	4
This class let me see some of the basic variables and interactions of digital games and simulations before confronting more complex versions of them later on.			1	7
While participating in this class, I felt a sense of authenticity, accomplishment, and safety in taking risks.			2	7
I learned skills as strategies within a meaningful context.			3	6
I view digital games and simulations as complex systems that can contribute to meaningful learning experiences.			2	7
The experiences I have had with games and gamification in this class are more important than the facts or theories presented.		2	2	5

**TABLE 4.** Data from course evaluations.

Students also were asked on the evaluation form to suggest ideas they had for improving this course. Only five students provided ideas: “definitely a few F2F interactions,” “more detailed instructions on some of the more difficult assignments,” “more detailed examples of gamified K12 formats,” and “put the day of the week on the syllabus for the due dates of quests.”

## ANALYSIS AND ISSUES

According to the course evaluation, just-in-time and on-demand information supports were lowest even though all responses indicated “Agree” or “Strongly Agree”. Students responded most positively to the evaluation item “In this class I was able to learn in ways I’m used to and to try new ways of learning without fear.” Since the population enrolled in this course tended not to consider themselves as gamers, there is a level of fear tied to the course. The course evaluation connection to Gee’s (2005) critical principles of good learning in video games provided direction in the design and connected theory to the students’ experience.

The challenges associated with this design case included redesigning the course to maintain the original objective for the course—to provide research-based strategies for integrating games and simulations into learning without the need to become full-fledged gamers themselves—but also to increase their knowledge and skills related to gamifying curriculum.

Use of the 3D GameLab platform put learners in the authentic position of gamer and allowed the instructor to model the gamification of a course curriculum. However, having to use a second tool, Shivtr, for a collaborative discussion area was less than desirable. Students had to create a login and avatar for both sites. In addition, even though the course content in 3D GameLab had links directly to quest-associated forums, students did not always access Shivtr through 3D GameLab. I neglected to initially request students to use the same name and avatar for both sites, which would have been less confusing.

The students moved more quickly through the quests than anticipated. I had originally set specific due dates for quests within a level, and even if they acquired enough points, the next level would not become available until a specific date. This did not work at all. Students were eager to continue progressing through the game without waiting. Additionally, those who completed all levels prior to the end of course date requested additional quests to continue playing.

I was concerned about achievement, awards and badges, as I did not want to create a scenario in which students were

motivated by extrinsic rewards. Therefore, we associated badges with level-completion and rewards with encouragement. As the instructor, I found myself eagerly looking for ways to encourage my students so I could give them a reward. It dawned on me that regardless of what environment I am teaching in, I should always be mindful about looking for ways to praise in my students.

## CONCLUSION

Our work on this course design furthered our belief that integrating games and simulations for informal or formal learning is as important at the graduate level as it is for students in PK-12 education.

Most importantly, we believe this undertaking gave us the opportunity to (a) help a population of primarily non-gamer educational technology graduate students see games and simulations as viable resources for improving learning and (b) model gamification as a means for our students to use gamification as their own instructional strategy.

## REFERENCES

- Boling, E. (2010). The need for design cases: Disseminating design knowledge. *International Journal of Designs for Learning*, 1(1), 1-8. <https://doi.org/10.14434/ijdl.v1i1.919>
- Carstens, A., & Beck, J. (2005). Get ready for the gamer generation. *TechTrends*, 49(3), 22-25. <https://doi.org/10.1007/BF02763643>
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining “gamification”. *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 9-15). Tampere, Finland: ACM. <https://doi.org/10.1145/2181037.2181040>
- Gee, J. P. (2005). Learning by design: Games as learning machines. *E-Learning and Digital Media*, 2(1), 5-16. <https://doi.org/10.2304/elea.2005.2.1.5>
- Harman, K., Koohang, A., & Paliszkievicz, J. (2014). Scholarly interest in gamification: A citation network analysis. *Industrial Management & Data Systems*, 114(9), 1438-1452. <https://doi.org/10.1108/IMDS-07-2014-0208>
- Kim, B. (2015). Designing gamification in the right way. *Library Technology Reports*, 51(2), 29-35.
- Ruhi, U. (2015). Level up your strategy: Towards a descriptive framework for meaningful enterprise gamification. *Technology Innovation Management Review*, 5(8), 5-16.
- Simpson, E. A., & Stansberry, S. L. (2008). Video games and teacher development: Bridging the gap in the classroom. In C. T. Miller, (Ed.), *Games: Purpose and potential in education* (pp. 163-184). New York, NY: Springer.