Chapter 15
Choosing a Serious Game for the Classroom: An Adoption Model for Educators

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List of Acronyms

COTS	Commercial-off-the-shelf games
DGBL	Digital gamed based learning
ESRB	Entertainment Software Rating Board
IT	Information technology
LMS	Learning management system
MMORPG	Massively Multi-player Online Role-Playing Game
WoW	World of Warcraft

Model Specific Acronyms

CYTIE	Cause You To Ignore Everything
RCIPR	Research, choose, investigate, pilot and reflect

15.1 Introduction

Educators eager to integrate serious games into the curriculum, but who are not trained or funded for game development, must choose an off-the-shelf or online game. These educators face a special set of questions. What game should I choose? How will I know if it meets the course's learning objectives? What are the technical considerations of integrating it into the classroom? Will students learn from it, or perceive it to be merely an entertaining waste of time? (Rice, 2007).

Current instructional design models do not address how an educator should conduct formative evaluation prior to the integration of online serious games or off

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the shelf games that are not specifically designed for their course. Is it possible to develop and implement an evaluative framework that enables educators from multiple disciplines to effectively incorporate serious games into their curriculum? What is needed to know if a game will deeply engage students in learning?

A team comprised of online instructors and an instructional designer developed and tested an approach on evaluation and implementation of commercial-off-the-shelf (COTS) video games. This adoption model for evaluating COTS harnesses the power of player and instructor evaluation to achieve a comprehensive grasp of the deep learning made possible by playing a well-chosen video game. For purposes of this chapter, only commercial games were considered. Games designed as "edutainment" (Egenfeldt-Nielsen, 2007) or for purely educational purposes are beyond our scope.

Members of the team presented papers on Serious Games and Digital Game-Based Learning (DGBL) (Prensky, 2001) at inter-college and system-wide professional development events for faculty. During each of these events, participants were surveyed, and subsequently targeted for focus groups and personal interviews. The data collected showed that participants were interested in DGBL but experienced cognitive dissonance (Festinger, 1957) about the implementation of DGBL in the classroom. The majority of participants indicated their concerns were choice of the game, establishing the games credibility to their students and the amount of technical support that would be required. The team drew from the fields of business, instructional design and education to develop a model that would allow the faculty to reduce their cognitive dissonance. This chapter presents and analyzes this model. The model serves as a catalyst to bridging this chasm between DGBL "early adopters" (Moore, 2006) and the "early majority" (Moore, 2006).

Currently most educators do not have the prerequisite skills to develop interactive, immersive games using a game engine. Game engine software provides for rendering of visual objects, physics within the game, sound, artificial intelligence, scripting and animation. There are virtual world environments such as Second Life and OpenSim where barriers to content creation are lower. But these environments still require the investment of hundreds of hours learning how to build and how to script to achieve the design and integration level of most COTS.

The games discussed in this chapter, fit a video game genre known as MMORPGs or Massively Multi-Player Online Role-Playing Games. MMORPGS for the most part are persistent 3D immersive environments that allow for social interaction, have varying degrees of content creation and have physics that are at the very least consistent with the rules of the game. In World of Warcraft, the largest MMORPG, over 12 million players subscribe monthly (Blizzard Entertainment Inc., 2010). In these games, the player is represented by a 3D character known as an avatar or more colloquially as a "toon." For most of these video games, the perspective of the player is looking over the character's right shoulder. A player in these games can choose to interact with other players or non-player characters (NPCs) that are controlled by the game's artificial intelligence. The ability to play with others or the social aspect has resulted in the formation of associations as guilds in many of these MMORPGs.

15.2 RCIPR Model

Based on 3 years of experience at the community college level with the adoption of virtual worlds, educational video games and COTS and feedback from educators at professional development events in 2010 and 2011, the following model was developed (Fig. 15.1):

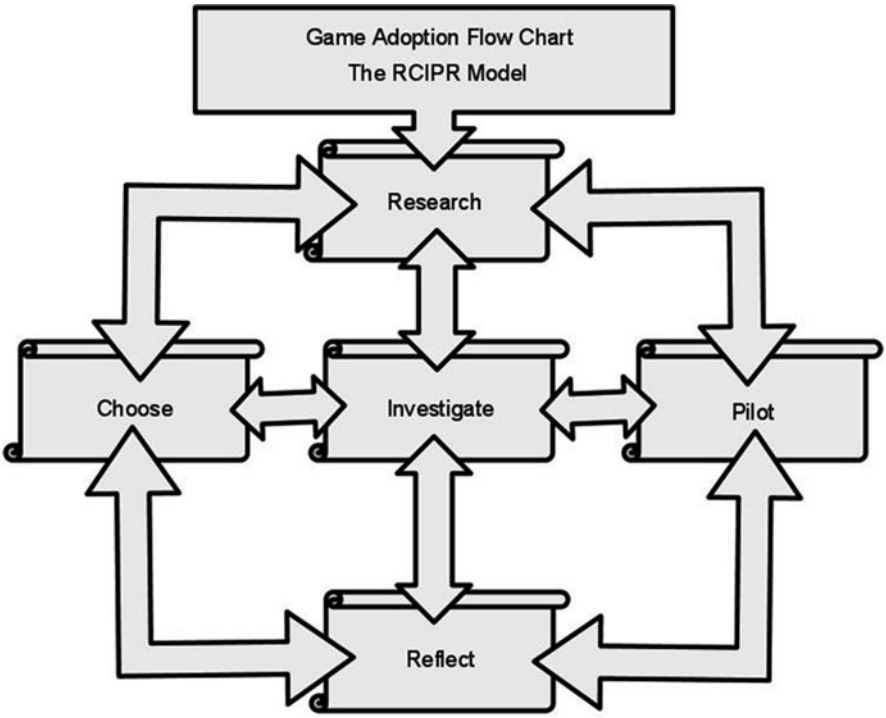


Fig. 15.1 RCIPR model

The five aspects of the RCIPR model are:

1. Research
2. Choose
3. Investigate
4. Pilot
5. Reflect

Using the RCIPR method, COTS were adopted in seven courses at Front Range Community College. The courses represent a variety of disciplines and in a variety of formats. COTS were successfully piloted in accounting, anthropology of folklore, introduction to business and multimedia courses. COTS were offered in both the campus and online section of three accounting courses.

Practically how does this model work? In the following section, a sample adoption plan of the RCIPR model is shown (Table 15.1):

Table 15.1 Sample adoption plan for a COTS game

Aspect	Action step	Purpose
1. Research	1. What are your learning objectives? 2. What COTS apply to your discipline? 3. What existing support communities are there? 4. Are there other colleagues with similar interests?	To develop a point of reference for the selection process. To clearly define goals and objectives of implementing COTS.
2. Choose	1. Is the COTS appropriate based on the Entertainment Software Rating Board (ESRB)? 2. Which COTS will be used? 3. What will be the duration of use? 4. How will the COTS be implemented into curriculum?	To develop rough draft of project. To develop a strong instructional design foundation. To pick the COTS most appropriate for use.
3. Investigate	1. What are the technology requirements of COTS? 2. What are your institutions IT limitations? 3. Does COTS Terms of Service and End User Licensing Agreement comply with institutional guidelines? 4. Can COTS be used on institutional computers or must it use student computers? 5. Can COTS be purchased by institution or by student?	To determine best fit of COTS within institutional limitations. To determine delivery options of COTS to students.
4. Pilot	1. Where does COTS fit in your lesson plan/syllabus? 2. How many points is COTS worth? 3. What are student deliverables? 4. What rubric will be used to assess student performance? 5. Will you use the COTS as an extracurricular activity or co-curricular?	To finalize COTS project and implement. To develop relevant assessment and evaluation tool. To collect student performance data for later analysis.
5. Reflect	1. How will COTS be documented for future reference? 2. How will feedback and outcomes be implemented for next offering? 3. How can additional resources discovered during pilot be incorporated into next offering?	To analyze data collected. To document COTS implementation. To develop strategies for future implementation of COTS.

15.3 Research

To begin, educators should acquaint themselves with the Entertainment Software Rating Board (ESRB). The ESRB is a nonprofit self-regulatory organization where the entertainment software companies can submit their games for age ratings and have their games screened for advertising and privacy factors. The website is located at http://www.esrb.org/index-js.jsp. Familiarization with this rating system will allow educators to see age appropriateness, content descriptors which allow the educator to see why the games received its rating and platforms. For example, LEGO Universe receives a rating of "Everyone 10+" for cartoon violence contrasting with World of Warcraft that receives a teen rating for Blood and Gore. The ESRB allows the teacher not only to research a game for age appropriateness and content but also by software platform.

Educators who may be the early adopters at their institutions should be aware that they are not first adopters. There is actually a community of practice (Lave and Wagner, 1998) that consists of educators who are using video games to include COTS in the classroom. When an educator is conducting their research they should either read the forums and/or consider becoming involved with this community of educators using games in the classroom. This community of practices meets in synchronously and asynchronously for discussions and activities.

Below are some asynchronous discussions forums and resources:

Rezed http://rezedhub.ning.com/ is an online forum that is run by the non-profit organization, Global Kids, Inc. Rezed was established in 2008 by a Digital Media and Learning grant administered through the Humanities, Arts, Science and Technology Advanced Collaboratory (HASTAC) Initiative of the MacArthur Foundation. Several groups on this site use the forum to ask questions and share their investigations and implementation projects. The two most active are:

WoW in Schools http://rezedhub.ning.com/group/wowinschools Lego Universe http://rezedhub.ning.com/group/legouniverse. Another forum was just recently started on Minecraft http://rezedhub.ning.com/group/minecraftinschool

Gamesnetwork is a listserv maintained by the Digital Games Research Association. While the discussion list is meant to focus on digital gaming and games studies, the use of COTS in the classroom and their appropriateness is a frequent topic.
The Second Life Educators (SLED) list https://lists.secondlife.com/cgi-bin/mailman/listinfo/educators while hosted by Linden Labs and nominally only for Second Life discussions includes educators who are using virtual worlds others than Second Life and COTS in their classroom.

WoW in Schools http://wowinschool.pbworks.com/w/page/5268731/FrontPage is a wiki that reports on schools using World of Warcraft and is starting to build a repository of lesson plans and curriculum.

Saving the Universe http://savingtheuniverse.wikispaces.com/ is newly developed wiki that is reporting on a educator who is chronicling her third and fourth graders' after school program that uses Lego Universe.

In addition to asynchronous activities there are several events online and face-to-face where the educators who are using COTS in the classroom have discussions, do presentations, and conduct meetups.

The Games Learning and Society Conference (GLS) http://www.glsconference.org/2011/ held yearly in Madison, Wisconsin provides a face-to-face forum for educators to meet with games and education researchers, game designers and fellow educators using games for teaching in the classroom. This conference has been held since 2004. Past conference webpages also give the educator a resource to see what educators belong to their community of practice and what COTS they use in the classroom.

Virtual Worlds Best Practices in Education Conference (VWBPE) www.vwbpe.org held yearly in the virtual world Second Life has been taking educators on online field trips. World of Warcraft, Runescape and Club Penguin have been visited by educators new to these COTS to show them the affordances of these games. Additionally there have been presentations and discussions of Lego Universe, Aion, WarHammer, Myst, Habbo Hotel and Cesar III.

The International Society for Technology http://www.iste.org has two special interest groups (SIG) that provide for opportunities to connect with this community of practice. At its annual meeting, two special interest groups, Games and Simulations and also Virtual Environments hold discussions, presentations and "birds of a feather" meetings. Additionally SIG Virtual Environments http://sigve.iste.wikispaces.net/ holds weekly and monthly meetings where speakers do presentations about COTS in classroom among other topics.

Rockcliffe Consortium, a Second Life based educational and professional development consortium, offers World of Teachcraft sessions and tours http://www.urockcliffe.com/education/world-of-teachcraft/ during their Sword and Board summer program as well as developing new sessions on the recently released MMORPG Rift.

Jokaydia http://jokaydia.com/ is an educational community of practice that has regular meeting in the virtual worlds of Second Life and Reaction Grid. They also sponsor tours into World of Warcraft that are attended by educators new to the game with mentoring by veteran players.

Cognitive Dissonance is an educator World of Warcraft guild, U.S. server in the Sisters of Elune realm. http://cognitivedissonance.guildportal.com/Guild.aspx?GuildID=228854&TabID=1927706

While the focus is not the development of curriculum or using COTS in the classroom, it is a guild for educators to play and learn about the gaming aspects of World of Warcraft.

Table 15.2 List of educators and COTS used who presented at VWBPE 2011

Educator	COTS	Affiliation	Grade level	Course/Program
Marianne Malmstrom	Lego Universe World of Warcraft	Elisabeth Morrow School	Grade 3 and 4 middle school	extra-curricular clubs
Lucas Gillispie Peggy Sheehy	World of Warcraft	Cape Fear Middle School, Suffern Middle School	Middle school	After school program, language arts elective
Gord Holden	Cesar III	North Island Distance Education School	Grade 7	Face-to-face and online courses
Diane Lewis	World of Warcraft	Sanford Middle School	Middle school	After school program
John Carter McKnight	World of Warcraft	Arizona State University	University	Public policy, English
Elisabeth Hayes	World of Warcraft	Arizona State University	University	English
Don Marguilis	City of Heroes WarHammer World of Warcraft	Middlesex Community College	2 year college	Psychology
Dona Cady	City of Heroes WarHammer World of Warcraft	Middlesex Community College	2 year college	English Composition, Creative Writing
Chris Luchs Kae Novak	Club Penguin Habbo Hotel World of Warcraft	Front Range Community College	2 year college	Fundamentals of Accounting, Principles of Accounting I, Principles of Accounting II, Intro to Business
Cherry Emerson Kae Novak	Club Penguin Habbo Hotel WarHammer World of Warcraft	Front Range Community College	2 year college	Anthropology of Folklore
Kate Hagerty	Runescape, World of Warcraft, Jade Dynasty	Front Range Community College	2 year college	Intro to Multimedia, Intro to Illustrator

Early adopters are members of a community of practice that has been enhanced by media on the Internet to include social media. Asynchronous discussion forums and synchronous events generate a large amount of information concerning COTS in the classroom projects. Twitter is especially useful for following individuals, groups and projects using COTS.

For example here is a listing of educators using COTS who presented at Virtual Worlds Best Practices in Education Conference (Table 15.2).

15.3.1 Research Resources Available at Your Institution

15.3.1.1 Educational Technology Personnel

Many of the early adopters of COTS listed above are educational technologists or instructional designers. Do your research and see if there are any educational technology personnel at your school, district, college or university. If there are, they may be available to assist you starting with your research and then continue as a partner as you go through most if not all the elements of the RCIPR model. At Front Range Community College, the instructional designer assigned to student success, functioned as an embedded instructional designer. The instructional designer developed step-by-step text and screenshot material to be included in the course learning management system (LMS). She was introduced to the class whether face-to-face or online early in semester, maintained office hours to meet with students and also the classes were given her email and office phone to contact her with issues and concerns.

15.3.1.2 In-house Grants

Does your institution offer faculty grants or stipends to support educators who are trying out new pedagogy or emerging technology? Inquire to see if you can receive initial funding for your pilot project. These funds could help pay for or subsidize the initial purchase of COTS software and subscriptions. These pilots may also facilitate cross discipline collaboration. Typically, these types of programs allow multiple educators to request larger amounts than individuals.

15.4 Choose

After evaluating faculty responses and conducting faculty focus groups, it was found that the instructional design process could have the greatest impact relieving cognitive dissonance in the formative evaluation phase. The team developed a model that addresses social learning (Bandura, 1977), metagaming (Gee, 2001; Squire and Jenkins, 2003), content analysis and supplemental material (Van Eck, 2006). Rubrics for selections of games and ensuring learning objectives were tested in a 3 week online faculty professional development course titled *Introduction to Serious*

Games. The educators who took the course self-selected. They decided to be early adopters of serious games in the classroom. They had confidence in their teaching ability and their ability to choose the correct text book and supplemental material. However, they did not have a high comfort level in choosing a game, developing the lesson plan or project, assessing the learning happening in the game and integrating the technology required for the games. Faculty participants wanted to know prior to introducing the game that it could be effectively adopted into the curriculum.

The team developed and tested a formative evaluation rubric for student engagement in online serious games called the CYTIE Rubric. It is based on Csíkszentmihályi's concept of *flow* (Csíkszentmihályi, 1990), Huizinga's concept of the *magic circle* (Huizinga, 1950), Keller's (1984) ARCS motivation model and Malone and Lepper's (1987) intrinsic motivations for learning. We departed from the FIDGE model of instructional design (Akilli and Cagiltay, 2006) by deepening the formative evaluation phase in order to specifically address faculty cognitive dissonance. If serious games, as a form of new educational technology, are to be adopted in an educational setting special care must be taken to address the "cognitive dissonance of the initially enthusiastic adopters" (Bentley, 2006).

15.4.1 CYTIE Rubric

The CYTIE rubric has two parts. It consists of an instructor review (Fig. 15.2) and a student review (Fig. 15.3).

In testing this rubric, educators played the game for 1 hour to test game navigation, audio quality, text quality and tutorials. After the hour of game play the educator were able to evaluate game play quality and ease of use for their students. Upon reflection of the game experience, the educator could rate the COTS game for education value, class use and duration.

To complete this formative evaluation of the game, student volunteers also played the COTS game for 1 hour. While the instructor review asked questions of education value and class use, the student reviews has students rank degrees of immersion, CYTIE and complexity. CYTIE or "Cause You to Ignore Everything" is based off Csíkszentmihályi's factors of flow (1990). CYTIE is most closely related to the optimal flow factors of concentration and distorted sense of time. Students in courses that piloted COTS game did report that they became so involved in playing the game that they continued past the required 1 hour.

Educators who are part of the early majority are more likely to experience cognitive dissonance than the educators who are early adopters. Early adopters are more likely to have integrated a greater number of emerging technologies already in their classrooms. By using this two part evaluation, educators can reduce the cognitive dissonance concerning using COTS games in the classroom. The educator will have tested the game themselves as well as piloted the game with students. They will be able to evaluate the degree of difficulty the students will have in playing the games as well as the level of immersion that may happen. The rubric provides the early adopters with a familiar type of evaluation while introducing specific attributes associated with game play.

INSTRUCTOR REVIEW

Game Title:

Ranking System Description: (One scroll is the low end, most negative, and three scrolls is the high end, most positive.)

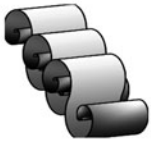
	Ranking Continuum		
Questions			
Game Navigation (How easy is it to learn the game controls or game objectives?)	The user interface is not intuitive and the game is difficult to control	The user interface requires some learning and the game is reasonable to control	The user interface is intuitive and the game is easy to control
Educational Value (How applicable is the game to learning objectives?)	Some value in specific instances	Value can be found with careful deliberation	Concepts are easily identified and explored
Duration (How much time do you need to become engaged?)	Very Slow	Decently Engaging	Engrossing
Audio Quality (How effective was the Audio?)	Takes a while to load, monotone, volume fluctuates	Good audio, informative and life like	Clear, clean audio, very specific to activity
Text Quality (How easy was the text to read?)	Hard to see text, user interface is too cluttered, reading level is inappropirate for some students	Legible text, user interface is fairly balanced, reading level is fair for most students	Clear text, user interface is extremely clear, reading level engages all students
Tutorials (How effective are the tutorials/ directions given?)	Took a while to get the hang of it	Challenging at first, but quickly figured it out	Clearly defined game rules

Fig. 15.2 CYTIE rubric for instructors

15.5 Investigate

15.5.1 Develop a Dynamic IT Plan

Planning should revolve around flexible goal oriented objectives; resources, personnel and time investments may change.

STUDENT REVIEW

Game Title:

Ranking System Description: (One scroll is the low end, most negative, and three scrolls is the high end, most positive.)

	Ranking Continuum		
Questions			
Game Navigation (How easy is it to learn the game controls or game objectives?)	Not great, felt too clumsy, too many buttons, etc.	Once I read the directions, I was able to get it	Intuitive controls, I was able to start playing right away.
Game Play (How smoothly does the game flow from one frame to the next?)	Game felt disorganized, slow, with errors and technical distractions	Some errors and minor halting or slow game play	Error free, fast game play with few technical distractions
Graphics (How aesthetcially pleasing are the graphics?)	Hard to see images, screen is too busy	Good graphics, though not the best I have seen	Great graphics, highly detailed and interesting
Degree of Immersion (To what degree, do you feel are part of the game?)	Some, but nothing compelling to make me want to do more	OK storyline, but not much character backstory, history, or society	Great story and lore drew me into the game's plot and setting
CYTIE Index* (To what degree, do you lose track of time when playing the game?)	Very slow	Good way to spend 30 minutes	What time is it?
Complexity (How easy is it to understand the game rules and/or objectives?)	Took a while to get the hang of it	Challenging at first, but quickly figured it out	Clearly defined game rules

** CYTIE stands for "Causes You to Ignore Everything."*

Comments:

(Strategies, Cheats, Shared Knowledge, Helpful Websites.)

Fig. 15.3 CYTIE rubric for students

1. *Measure Your Infrastructure* – Check the application's basic and recommended requirements. If your equipment meets the basic requirements, be ready to adjust the time investment portion of your plan or look to increase resources.
2. *Discover the IT's Realistic Capabilities* – Be realistic about what IT personnel can and will do. IT personnel may never have been asked to install an application similar to a commercial off the shelf game. Share your research regarding other educational institution's successful implementation of a game.
3. *Follow Protocol* – Use the official channels to make your requests; most educational institutions have standard operating procedures and paperwork that needs to be filled out in order to have software installed. Additionally many institutions have set times of the year where new software installations take place. Make sure you are aware of these procedures and dates. Meeting established procedures ensures your request has the appropriate administrative and technical evaluations and approvals. Check with administrators first as the appropriate channel to develop new curricular adaptations.
4. *Build a Relationship with an IT professional* – You should also develop a positive relationship with a member of the technical staff who can advise you of the current system capabilities and upgrades needed for your implementation. Ask other educators who have worked with your technical department in the past who they would recommend as collaborative and understanding of educational affordance. Approaching the IT personnel most likely to encourage early adopters will assist in removing barriers that are not based on IT capabilities. They can also advise you of adoption hindrances to your specific selection.

15.5.2 When the Technical Staff Cannot Fulfill Your Request

During your first attempts at implementing COTS and other games into your curriculum, you may run into concerns with IT compliance at your institution. Most IT departments will not allow users to download programs onto institutional computers for security reasons. There may also be issues with graphics cards and broadband access at your institution. Many IT directors will request that you provide them with references on what other peer institutions are using COTS and games for learning. The key is to remember that IT personnel will be looking at issues from campus informational security perspectives and will focus on the Terms of Service and End User Licensing Agreement not necessarily the educational value of the COTS game.

The researchers have found that when negotiating with IT staff to have software applications installed, you may have to call upon the educators' community to talk to your institutional IT personnel. The researchers did work with an educator at an outside institution to assist him in having software installed. While the educator did not know the exact requirements, the researchers had two phone conversations with the educator's IT personnel on how to give access without compromising the institution's firewall.

Another strategy is to engage IT staff in the selection of the game to develop departmental buy in. This may also lead to introductions to other games and genres that the educator was not initially aware of or considering. Having an IT member's assistance during selection will ensure that the final COTS game is compatible with campus IT resources.

15.6 Pilot

15.6.1 Low Risk Options (Safe-to-Fail)

For primary and secondary level schools try piloting a game as part of an after school activity or student club. Several World of Warcraft in Schools projects have sprung up around the idea of targeting at-risk students, leveraging the attraction of the game both to teach twenty-first century skills and Internet based literacies as well as encourage homework completion and positive study habits. There are other possibilities as well, the important point is to find a venue where the use of the game allows for experimentation and reveals the learning potential to critics in a non-threatening environment.

At the K-12 level, educators will want to look for pilot programs that are safe-to-fail or low risk. Low risk programs offer educators an optimal test bed to trial possibly contentious educational applications and curriculum. Under the guise of "for fun only" setting educators can comfortably explore the limits of a particular activity's curricular potential. Every school seeks out those on the staff who are willing to engage the hardest to reach students. Schools entertain many traditional and non-traditional extra and co-curricular activities. In a school that runs a games design course it seems natural to have a club called game explorations.

While educators at higher education institutions may have more flexibility on the initial adoption of COTS for the classroom, these same educators based on the 15 week semester in the United States, have less time for successful implementation.

At the community college and university level, there are two low risk options available. The first is the extra credit project and the second is as one of the options in a project assignment. In the accounting courses, World of Warcraft was introduced as an extra credit project. Once the World of Warcraft project was developed further, it was then introduced as a one of two options for the last project of the semester.

15.6.2 Prepping the Students

At Front Range Community College, in courses that have adopted COTS and other emerging technologies, students at the beginning of the semester are given a detailed survey of their use of technology. This survey includes questions on amount of time spent daily using the Internet, their social media activities and their familiarity and

usage of MMORPGs. This allows the instructor and instructional designer to see the student's level of involvement with technology outside the classroom.

In the accounting courses, based on these responses, the instructor and instructional designer plan the course project as either an individual effort or a group project. If a group project is assigned, the instructor based on the survey results ensures that there is at least one student that plays MMORPGs outside the classroom. The results of this grouping have been that this allows for additional peer-to-peer learning.

Additionally, the researchers have found that writing statements explaining to traditional age and adult college students the educational value of the gameplay reduces the number of inquiries concerning the game. An example curriculum statement is:

> How does this relate to you as a student in an Accounting class? As an accountant, your job is to conservatively estimate value and ensure GAAP appropriate accounting standards are used. This project puts your current knowledge of accounting to the test. You will draw from the all the chapters you have covered in ACC 121 and ACC 122 so far; Chapters 1–20. These chapters contain all of the accounting background that you will need to complete this project. Both of Projects III's options will call on what you have learned in the class this semester. You will use what you have learned to apply accounting terminology, concepts and principles in accordance with GAAP in a setting new to you. You will also be asked to make recommendations of basic internal control principles to protect assets, of cost accounting aspects, and general accounting/ business strategies. Developing these accounting skills, being able to think critically and adapt to novel business situations will make you a very valuable employee.

15.6.3 Feedback from Students

As a way of receiving feedback, the accounting instructor had students post their results and impressions in the LMS's weekly discussion forum. Besides their results, students were asked to answer the following questions:

1. As far as illustrating business and accounting principles, what did this do well?
2. As far as illustrating business and accounting principles, what did this not do well?
3. Would you recommend this game to friend if they wanted to learn about accounting?

By requesting feedback, the instructor was able to elicit frank feedback and commentary from students regarding COTS game and project instructions and rubric. This feedback was then incorporated into the next rendition of the project to continuously improve the project and hone learning objectives and instruction. By avoiding yes, no responses, the students were required to construct their thoughts regarding successes and shortfalls of the COTS and project.

A secondary benefit was that the students were able to voice their concerns and any issues that they had with the game in a group context. Students were able to

see that other's shared their challenges and also share tips and tricks to fellow students to ease future game play. An interesting byproduct of this discussion was the development of student's troubleshooting for other students to resolve issues and encourage collaboration.

During the documentation of the pilot, the instructor will typically become aware of some potential negative aspects of utilizing COTS versus games designed specifically for the curriculum. Some examples would be the student does not immediately comprehend how the COTS assesses a topic or skill, the student becomes distracted by game play or other game mechanic issues and not learning objectives, the student feels that the game is too simple for their grade level, and the student misinterprets the purpose of utilizing the game to achieve the learning outcome. These are all common themes when students are first exposed to pilots. Typically, resolution of these issues occurs when the faculty reviews the curriculum statement with the student focusing on the learning objectives and outcomes.

15.6.4 Examples of Possible Pilots

Course or activity	COTS	Grade level	Course/program
History class	Cesar III	Middle school	Extra credit activity – Roman campaigns
English or literature class	War Hammer	High school, community college, university	Optional project – Joseph Campbell's the Hero's Journey
Before or after school program	Lego Universe	Middle school	At risk students as extra-curricular activity
Business course	World of Warcraft	High school, community college, university	Extra credit activity – auction house
Physical science class	Minecraft	Middle school	Rotating computer lab station

15.7 Reflect

Reflection is an additional means for documenting your project's progress. In teacher training and professional development for the past 20 years has used a model of "teacher as reflective practitioner" (Grushka et al., 2005, p. 239). The last aspect of the RCIPR model is reflection (Luttenberg and Bergen, 2008).

Since there is an active community of practice on the Internet, it is suggested that educators also consider posting their reflections on social media outlets such as twitter, blogs and wikis. It will also allow educators to receive feedback, be asked questions and also share the knowledge they have gained. Presentations at conferences and participation in live discussions events also allow sharing your findings and best practices with your colleagues.

15.7.1 Official Documentation

The first part of the reflection starts during the pilot when the educator is documenting their pilot project. Beyond their pilot project, educators should be tracking student academic performance as a whole. This would be done by also measuring.

Educators should commit serious time and thought to implementing their plan and drafting an explanation for how the game environment supplements the curriculum and expands the general learning environment of the course. The explanation should involve assessable pedagogical benchmarks that can be measured through documentation. Educators, as early adopters, should be willing to commit to documenting the trials, successes and failures of their project. For an implementation to succeed past a single instructor there needs to be an evidential trail for successive implementation for the early majority.

Machinima is another method for documenting your pilot program. Machinima is a portmanteau of Machinima and cinema. It is live screen capture of the 3D animation in MMORPGs. You will need to check with the terms of service in the MMORPG you are using to see if screen capture for educational purposes is allowed. If it is allowed, Machinima is a very effective way of documenting your project. It also acts as a medium to allow other educators who may not necessarily be able to willing to login into the COTS to see what learning is taking place.

15.7.2 Collecting Data

In addition to documenting, there should also be formal and informal data collection instruments built into the pilot program. Formal data collection may take the form of student generated content, responses to surveys or quizzes, screen shots of live events, student journals, class blog or website, or performance on assessments covering the concepts and learning objectives outlined in the research phase of the RCIPR model.

Informal data collection may take the form of student comments in class, chat logs from COTS, discussion overheard in hallways, or simply unsolicited discussion on the COTS from students.

Data collection should not just focus on the COTS, but also seek to measure student performance in other curricular activity. What skills and study tactics are students applying to other areas of the class? How is overall class performance compared to non-pilot classes? COTS and games are not just entertainment simulations; they also address new media literacy (Jenkins et al., 2005).

15.8 Conclusion

The RCIPR model offers educators a framework to effectively implement their COTS pilots at their institutions. As educators continue to consider the adoption of COTS, the need to critically evaluate games, communicate the software and

hardware requirements to IT, pilot the games, reflect on implementation, and document the results will become increasingly important. For educational institutions to consider COTS seriously, educators and instructional designers will need to develop dynamic implementation plans, collect data, document their work, and present their results to peers. The RCIPR model addresses how a faculty member or instructional designer should conduct formative evaluation prior to the integration of online serious games or off the shelf games that are not specifically designed for their course. This model is an evaluative framework that enables faculty from multiple disciplines to effectively and conveniently incorporate serious games into their curriculum.

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