Finding the Journal of Odysseus: Making and Using Pervasive Games in the Classroom

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What is a Pervasive Game? And Why Should I Care?

A “pervasive game” is a game that exists across multiple mediums including the *physical* environment around the player. This genre of game is closely related to “alternate reality games” (ARGs) and is usually understood to only deviate from ARGs in that ARGs exist *only* within digital media; however, both utilize a core narrative that usually places the player in the explicit or implicit role of an investigator, who uncovers the narrative and subsequent content as they solve puzzles to bring the game to its conclusion. In addition, the narrative is often “archaeological” in nature: the story develops through “found documents” and media that the player discovers either directly or indirectly as they solve the game’s puzzles.

Pervasive games are a natural game “platform” to use in a classroom. Pervasive games do not require a pre-existing graphical engine, like a video game, nor do they require a static physical space and equipment, like a tabletop game. Pervasive games can be the best of both the digital and physical worlds. Even better for the classroom: *they can be designed by you to fit nearly any lesson, unit, curriculum, or student need*. It’s an educational reality that sometimes pre-existing games can be very exciting square pegs for the round holes of classroom demands. The custom and modular nature of pervasive games, combined with their relative ease of content creation, allows educators to design fun, engaging games that can directly support their unique curricular goals and learning outcomes. This paper will explain some of the basic elements of the pervasive ARG, demonstrate how educators can construct some of the major mechanisms, and illustrate how ARGs are a dynamic toolset for any classroom.

Dungeons & Dragons & Classrooms

I became an educator because over the years I had several excellent teachers who showed me that learning is not just medicine one has to swallow painfully and benefit from, but a joyful, powerful experience that one can - and should - guide your life with. If as a student I had a few lessons every year that I really enjoyed doing, surely I could, over time, design an entire year long curriculum that captures that joy from beginning to end. This was my starting point. As a lifelong gamer, I long ago recognized how much intellectual prowess, resilience, and focus games can demand from their players. Games clearly seemed like the vehicle to combine both experiences.

Like many teachers, I can get frustrated by the lack of engagement in many students and see it as a primary responsibility to design my lessons to be as impactful as possible. Some of this is a natural characteristic of adolescence, but much of it is a result of the antiquated way schools and curriculums are still structured. Perhaps ironically, games are an ancient way of overcoming this apparently modern problem. We are hardwired to learn by playing: *we learn to game and we game to learn.*

I knew games had potential because I had a few teachers of my own who used games in their classrooms to great success. My 9th grade English teacher (who inspired me to become an educator) used his love of role playing games like *Dungeons & Dragons* to help us dive deeper into our reading of Homer’s *Iliad*. He assigned every student a character and laid out the rules for what was essentially a collaborative creative writing exercise. By reading deeply into *The Iliad*, including chapters we skipped as a class and outside mythological sources, you could acquire information about your character - be it a legendary weapon, ability, ally, etc - and you could use that source to write your own version of the Trojan War, one week at a time. It was instantly one of the most enjoyable classroom experiences I ever had despite its relatively simple design. That unit rattled around the back of my mind during my first few years of teaching, but it wasn’t until I played Funcom’s Massively Multiplayer Online Role Playing Game (MMORPG) *The Secret World* (2012) that I was able to take this vague impulse for classroom gaming into a real executable unit. *The Secret World* places thousands of players in a shared online world where they, as agents of clandestine organizations (e.g. The Illuminati or The Templars), interact in a game universe full of supernatural dangers and conspiracy theories come to life.

What attracted me to the *The Secret World* was what they call “Investigation Missions”. I read an early review that lauded them as deep and interesting puzzle solving experiences, a large departure from the usual fare in MMORPGs which are infamous for including dull, repetitive tasks whose completion is often referred to as “grinding”, since they are necessary for progression but are generally considered boring on their own. The Investigation Missions in *The Secret World* required the player to not only use the information and events contained within the game but, primarily, the built-in Google browser to search the Internet for the relevant information and clues to solve

the puzzle. A few hours into the game I realized what they had done was include ARG style puzzles and weaved them into the virtual landscape of their game. It all hit me at once: the portability of cross-media ARG puzzles, the dynamic nature of using real world information in a fictional game world, and the ancient Siren song of puzzle solving. I realized I was spending hours researching arcane topics, decoding, and sweating over riddles just to play a game. I also realized that the game engine itself was not integral to the experience...I could make these puzzles! Immediately, *Dolus*, the game about the crafty thief who has stolen the journal of Odysseus, was born.

Begin at the beginning…

The most intimidating factor to creating a pervasive game is that you are immediately confronted with a fire hose of choices. However, that is also the game's greatest strength, as you have a nearly unlimited palette of tools to create your puzzles, very few of which require any type of expert design knowledge. The first piece of advice for puzzle creation is: *steal*! Start paying attention to puzzles and problem solving in your favorite games, movies, books, and TV shows (the mystery genre is particularly ripe for the picking). Ask yourself, "could this puzzle solving experience exist on its own or in another format?" Any challenge or puzzle that connects to your lesson outcomes or the skills you want your students to focus on can potentially be used. Using the scaffold of pre-existing puzzles will not only help you get started, but will help you branch out and create your own once you see how they tend to work. I like to think chronologically, so I started at the first puzzle for *Dolus* and worked from there.

The first puzzle in any pervasive ARG is what is referred to as "The Rabbit Hole". Like Alice in Wonderland, this is the first step into the fictional universe of the game. Most pervasive and ARGs operate under the ethos that "This Is Not a Game": part of the fun of ARGs is pretending that the player has accidentally stumbled onto a hidden reality heretofore unknown to them; the multimedia element of the game synergizes perfectly with this: suddenly the game world is *everywhere*, if one looks hard enough. The Rabbit Hole is the door into the ARG universe and the introduction to the game itself. A common way to create this "rabbit hole" is to use a popular mechanism of ARGs: the found document; for *Dolus*, that would be a fictional article purportedly from the BBC. I decided that a fake news article would be a great way to put the game at their fingertips and a perfect introduction into the "This Is Not a Game" mindset. I found Pages by Apple to be a great resource for document creation since I lacked experience in Photoshop or other professional level design programs. To create it, I went to the BBC World News site and by using screenshots, simply copy and pasted the different web page elements onto a blank page in the same style. I then formatted the article text to match the style on the original page. For simplicity's sake, I opted to make the document a PDF since I did not have immediate knowledge to plausibly render the article as a functional web page. In the end, the restraints ended up helping and I framed the Rabbit Hole narrative as a "cool article I found but seems to have disappeared from the BBC site (weird, huh?)." Once that document is sent, the game begins.

Early on I decided that the core narrative of the game would be relatively simple but hopefully engaging: a priceless document, the "journal of Odysseus" is stolen by a mysterious thief and he is challenging the students, a la The Riddler, to solve his puzzles in order to get them back. The BBC article is written as authentically as possible but does immediately drop some clues that Something Is Strange: the befuddled archaeologist is Dr Henry Jones III (Indiana Jones), for example. The inclusion of the text of a mysterious riddle begins the hunt and the riddle is worded to explicitly reference an element of my school's culture in order to draw their attention.

Compared to the types of ARGs found in the wild, *Dolus* was designed to deploy comparatively larger "sign posts", if you will, especially in the early game since this is a genre of game that few, if any, of the students were familiar with. Even then, some students needed a rather significant nudge to read closer and realize there was a riddle to be solved. The riddle eventually leads to a fake, but functional, school email address (dolus@fairfieldcountryday.org) that was set up with the help of the IT department. Once that email is contacted, the student is immediately sent a "welcome video" which sets up the antagonist, lays out the basic "plot" and some more narrative flavor, and offers the next puzzle. This was relatively easy to make as well. Armed with a laptop, a script, iMovie, and a quick tutorial on how to use the free program Audacity to scramble my voice, I laid down an audio track of Dolus introducing himself. In addition the audio track, I inserted a few relevant images into iMovie and uploaded it to a private channel on Youtube, under an account made specifically for this game.

While the email address helps add to the pervasiveness of the game, it did become a bit clunky since it required a response to each puzzle solving attempt and to forward each subsequent game element, one by one. Use of password protected videos and documents should help streamline the game more in future iterations.

Ignore the Man Behind the Curtain

Given the nature of the narrative, I decided it would be best to follow the traditional role of ARG facilitators: the

"Puppet Master". Being the "man behind the curtain" augments the Not a Game element and forces the players to engage directly with the game in order to progress and gain information. In traditional Internet based ARGs, this is much easier. You simply remain hidden and do not directly contact any game player, only communicating through the "official" game elements and puzzles. In a pervasive game like this one it's not as simple. I chose to remain Mr Fallon, Mild Mannered English Teacher, whenever possible and to claim ignorance of the mysterious Dolus and other game elements swarming around me. In many ways this worked, my students loved the wink-wink-nudge-nudge act and it helped channel them into the game elements instead of trying to short circuit the puzzles to get the answers from me. However, that did create some issues when students became authentically stuck. It is completely legitimate, particularly if you have a dramatic spirit, to put yourself into a character and facilitate the game not only through the explicit game elements, but yourself as well. However, the "invisible" Puppet Master role is perhaps easier to manage, but it all depends on your goals and narrative!

Curiouser and Curiouser: Making Puzzles

The heart of any pervasive ARG is going to be the puzzles themselves. This is the most daunting element to those who want to do an ARG for the first time. The customized element of ARGs also makes it difficult, but not impossible, to simply "share" the game. Since ARGs utilize so many different mediums, they often exist on your hard drive as a sprawl of folders full of documents, images, links and flowcharts, in varying states of organization. The goal of this paper and presentation is to help you create your own, however, and in that regard, let's take a look at a puzzle created from scratch.

The foundation of many ARG puzzles are codes and ciphers. These not only offer intriguing and challenging thinking but they avoid a critical design flaw: *false negatives* (Foster, 2013). A false negative, getting the right answer and not immediately realizing it, is perhaps worst case scenario for an ARG puzzle. Nothing will demoralize a player faster than investing a large amount of time and not having that investment accurately rewarded. In my experience, students do not mind spending hours failing to crack a puzzle (in fact, they often love it!) but if they were to roll right over the correct answer they are likely to back out: no one likes to have their time wasted. Codes and ciphers, however, instantly and accurately indicate success. Once you solve the puzzle, the answer wholly or in part reveals itself. As a result, they are the bread and butter of many ARG puzzles.

In this puzzle I chose to use a book cipher because it would involve the physical medium of an actual book and I found an easily accessible example of the cipher in the Sherlock Holmes novel: *The Valley of Fear*. In fact, I decided to weave that directly into the clue. I used the free text to video site, xtranormal.com, to create another video clue. It uses a combination of preset animations and a voice synthesizer for text to speech. I used xtranormal to save time compared to doing a custom video in iMovie but also found it helped augment the pervasiveness of the game: the more mediums and formats the games incorporates the better. It also added to the narrative, which played into Dolus' character as the mysterious thief that can be anywhere, at any time, in any form. The clue itself reads as follows:

When Doyle's detective went to the Valley of Fear, he used this method to discover his first clue. So shall you. Your key, however, is 1 5 9 1 9 4 0 4 2 7. All you need, though, is 108. It is something that is close at hand, I assure you. Once you find your key the door below will open. Good luck!

220 246 4 223 121 4 225 121 57

In Dolus' video clue he directly references *The Valley of Fear* which forces the student, at the very least, to find what that is and go to the Wikipedia entry. From there (or the novel) the students will realize that the "method" Sherlock Holmes used was a book cipher. Modeling their strategy after Sherlock's, they will realize they need three things: a particular book, a specific page in that book, and specific words on that page. The book they need, the "key", is their classroom copy of *The Odyssey*, identified by its ISBN number 1591940427 hence it being "close at hand", and the page in question is 108. But what of the series of numbers? If they execute the cipher correctly, they discover that each number refers to a word on the page, e.g. 220 is the 220nd word on page 108. Once compiled correctly (they will realize if they're doing it right very quickly because a sentence will form) they will see they are being asked to email Dolus the name of Odysseus' father, something that memory or a quick search will remind them is "Laertes". Once that name is emailed to Dolus, the next puzzle begins.

Hopefully, this example illustrates the "moving parts" of a pervasive ARG puzzle. From here, you can go anywhere. All mediums, digital or physical, are useable, and ciphers and codes are hardly a requirement, but they do set a very useful foundation. You can do something as simple as writing a mysterious code on a whiteboard and see who can crack it. You could "scale" the difficulty down by adding a hint, perhaps an unexplained bag of Caesar salad mix sits under it (a hint that it is a Caesar cipher). When it comes down to it, the average puzzle of an ARG

is some type of riddle or code whose pieces are strewn about different areas of the digital and physical world that the student can find. However, with your own unique narrative and tweaking, it can quickly take shape into almost anything your curricular goals require.

How is a Game Like a Lesson?

Dolus was designed to augment the reading of Homer's *Odyssey*. I didn't envision there to be - or perhaps I just failed to imagine - a *direct* facilitation of the text in a traditional sense. As of now, the game operates parallel to a more traditional discussion based unit that covers myths, epics and the character of Odysseus as a literary hero. Thematically, however, what makes Odysseus a unique hero in the Greek pantheon is that he is a tenacious problem solver that thinks his way through seemingly insurmountable challenges. I designed the *Dolus* game to require and develop a similar intellectual resilience. At my school, three of our institutional "core competencies" are resilience, collaboration, and critical thinking, and in that regard the game connects closely with my curricular goals throughout the year (See Table 1).

In addition, the challenge is not only the explicit intellectual hurdle of the particular puzzles but the greater "macro-puzzle" of problem solving in the modern world. In today's information age, virtually any piece of data is accessible in a few keystrokes; the real challenge is knowing what data or tools you need and when you need it. Half the challenge of ARGs is figuring out what tools you require and how to use them to solve the problem at hand. In that regard, pervasive ARGs dynamically combine an ancient element of puzzle solving with the modern demand of finding the right resources and using them to problem solve. However, ARGs' modular nature also uniquely positions them as an accessible game platform for classroom teachers.

The Advantage of Pervasive ARGs: A Bespoke, Accessible Experience

There are more and more gaming resources available to classroom teachers every day. Video games and tabletop games are leading the charge and they are likely to only grow in their educational utility as their quantity and quality increases. However, even games that are explicitly designed for students have built-in limitations that cannot be avoided, limitations that can often preclude them from classroom use. The best tabletop game built from the ground up for students can only be played in the same physical location when students are present. Even the best video game for learning cannot change its code to adapt to particular student needs. Pervasive ARGs are literally a custom game for your classroom. The narrative and puzzles can take any shape or form and as a result, so can the game. Any skill set or content knowledge can be utilized, so any curricular goal can be incorporated. The only impediment to implementing pervasive ARGs is that usually you will have to create them yourself; however, they are an investment that will return significant dividends as they create an immersive, challenging learning experience tailored to what you want. Included is a list of sample Common Core Standards, Learning Outcomes, and Essential Questions to illustrate how a pervasive ARG can be incorporated into today's curriculums (see Table 1).

However, one of the most significant advantages of the pervasive ARG is its accessibility; a game is useless if your students cannot actually play it when and where they need to. According to the National Center for Education Statistics (2009), there was only one computer in the classroom for about every five American students and only 39% of public schools had wireless internet connections available to the entire campus (2008) . Clearly, there is still an accessibility problem when it comes to video games that either require a classroom internet connection or a dedicated computer, particularly if each player needs their own single device, as is often the case. However, if we take into account the number of mobile internet connected devices in general, such as tablets and smartphones, access improves dramatically. According to the PewResearch Internet Project (2013), 75% of teens had access to an internet connected device like a smartphone or tablet. Once all internet connections are taken into account, Pew found 95% of teenagers have regular access to the internet in one form or another. As internet access continues to proliferate, ARGs will only become more logistically feasible for students and teachers. It is this existing ubiquity that pervasive ARGs fully leverage. Since ARGs do not rely on a graphical game engine, by co-opting existing online media platforms, it is easy to design puzzles that interact with any internet connected device, not just a laptop or computer. ARGs give you a digital gaming platform that you can be confident that most, if not all, of your students will be able to reliably interact with in and out of the classroom.

Remaining Questions and Challenges

There are still many questions to be answered not only for *Dolus* but also game based units in general. For the vast majority of teachers the first question is: *how do I grade this?* As *Dolus* was new territory for my students, administration and me, I avoided having to answer this by formulating the game only as a sizable extra credit opportunity. However, as I add content and grow more confident in the game, I intend to make it required.

On top of the ancient tensions of grading group efforts, there is the novel problem of how to make game based learning mesh with traditional grading systems. For something that is designed to be an “old school game” - completion is not a foregone conclusion- because it is both challenging and thematically fits with the *Odyssey*, I have been hesitant to require it. Does the first group done get an A+? Does the second get an A? Third get a B+, etc? What if groups never finish? Do they “fail”?

I also struggle with the “difficulty level”, as many professional game designers no doubt do . I like the idea that this has a free ranging element despite being heavily scripted. Students are free to solve the problems however they can and use whatever tools they can find. This is also means that some groups may get stuck, and most groups do not finish. Should 100% completion be a goal and should I edit the game to emphasize this?

With both my age group (7th grade) and my geographic location (suburbia) I am limited by where I can make the game “exist”. Much of this is solved by sticking to the well trodden path of ARGs - the digital environment and media - since that is accessible anywhere with an Internet connection. At a 1:1 laptop school, this is a natural fit. However, some of the most successful moments in *Dolus* have been the times that the game goes “outside” the digital and becomes a fully pervasive game - both in the physical *and* digital world. For many students the climax of the game is tracking down a false rock by our school’s cornerstone with a QR code embedded inside. The experience so far suggests that increasing the physical pervasiveness would increase the quality of the game.

As a teacher of suburban students who cannot drive, the physical pervasiveness appears to be limited to just campus (and that has potential). Puzzles *could* be engineered to lead to local settings - and it would be quite fun! - but that could become complicated, especially if the game became mandatory. If I was in an urban area and/or with older students, I feel I would have the freedom to lead them anywhere they could ostensibly travel. Perhaps this is not as bad as I think? Should I not be afraid of a student begging his parent to go to a local spot so he can solve a puzzle? To me, the game obsessed teacher, it sounds awesome. But to a busy parent with limited time perhaps it is a ridiculous request.

The second major question: does the game *work?* After two iterations, I see clear “proof of concept”. The students love the This Is Not a Game ethos of the ARG style. The “Sherlock Holmes” type thinkers - who have to crack any puzzle given to them - get addicted fast. One student this year would routinely beg for the next step and then proceed to spend hours of his own time that night to solve the puzzle. The middle ground students are either interested in playing a “game” or are incentivized by extra credit, or both. There are some students who hit the first wall and stop.

However, what I like about this (and most game based learning) is that it *compels students who are normally not engaged*. Traditionally motivated students are still motivated and jump into it. However, there are students who are usually less enthusiastic about more traditionally constructed units that dive headfirst and do not stop. That is a crucial element and it illustrates an underappreciated concept*: games are a style of learning, if not learning itself.*

Final Thoughts

Pervasive ARGs are a powerful platform for game based learning and they offer a unique level of customization, access, and engagement that few other game types offer. Any teacher who knows how to tweet, copy and paste, or make a Youtube video is capable of creating a deep gameplay experience for their students that can rival what is found on any video game screen.

Common Core Standards and Ongoing Learning Outcomes

Key Ideas and Details	
CCSS.ELA-Literacy.CCRA.R1	Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusion drawn from the text
CCSS.ELA-Literacy.CCRA.R2	Determine central ideas or themes of a text and analyze their developments; summarize the key supporting details and ideas
CCSS.ELA.Literacy.CCRA.R3	Analyze how and why individuals, events, or ideas, develop and interact over the course of a text

CCSS.ELA.Literacy.CCRA.R4	Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
CCSS.ELA.Literacy.CCRA.R5	Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text relate to each other and the whole.
CCSS.ELA.Literacy.CCRA.7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
Ongoing Learning Outcomes	
SLO #1	Students will navigate, evaluate, and ultimately solve a series of problems similar to those Odysseus is faced within the epic in order to experience the critical thinking process of overcoming obstacles.
SLO #2	Student will identify, use, and manipulate media and media tools in order to problem solve using 21st century technology skills.
SLO #3	Students will analyze the choices Odysseus makes on his journey in order to model their own gaming strategy to achieve the same success.
Essential Questions	
#1	How can we learn to solve a wide variety of real world problems using critical thinking skills?
#2	How can we use media and media tools to solve problems similar to those present in the Odyssey?

Table 1: A list of example Common Core Standards, Ongoing Learning Outcomes, and Essential Questions for the *Dolus* game unit

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