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Batman Meets Gagne: Analyzing Commercial Video Game Instruction through the Lens of Instructional Design

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Abstract: This paper will examine how Gagne's Nine Events of Instruction (1992) may appear, perhaps inadvertently, within commercial games that guide the user from novice to expert player. By employing a qualitative artifact analysis methodology, we examine a popular action adventure video game to determine if game designers encourage players to build game expertise by employing similar events to Gagne's instructional design model. We demonstrate that our artifact of analysis does consistently employ Gagne's events, though often in a manner unique to a digitally mediated space. We conclude that an experiential game setting has the potential to be a platform for instructional deliver

Introduction

According to Pew Research Center, 97% American teens ages 12-17 play some kind of video game (Lenhart, Kahne, Middaugh, Macgill, Evans, & Vitak, 2008). In the last year, the global market for games was \$67 billion in annual sales (Gaudiosi, 2012) making this the most profitable form of media being consumed today. In comparison, total movie sales (\$10.9 billion)

and music sales (\$16.5 billion), combined, make up less than half of video gaming revenues (Germain, 2012; Collett-White, 2012). Games are *the* new media and will continue to grow as a media as production and resources follow consumption.

Games require action on the part of the consumer. To ‘play’ any game, first the user must learn the digital world, challenges, narratives, and semiotic system. In essence, players must be constant learners; learning is intertwined with the actions of the game (Gee, 2003). Game designers seem to have generated compelling environments that encourage game mastery as an outgrowth of play.

It is evident that many play activities have characteristics that facilitate learning rules and parameters unobtrusively. We suggest that by identifying them and relating them to an established instructional design framework we can reinvigorate an instructional design staple and perhaps discover insights to exploit game environments for more traditional instructional goals.

For the purpose of this paper, we define play as a voluntary activity that is intrinsically motivating and is largely driven by endogenous goals and choices that can have a make-believe quality (Rieber, 1996). Digital gaming media encourages informal learning of complex game goals through play. Extending lessons garnered from achieving game goals to learning objectives not specifically and solely designed for entertainment is a significant challenge to education.

Gagne defines instruction as, “a deliberately arranged set of events designed to support internal learning processes,” (Gagne, Briggs & Wager, 1992, p.11). He goes on to say that the nine Events of Instruction are intended to be “these external events that are being considered, chosen and represented in the communications and other stimulation offered to the learner. Their purpose is to bring about the kinds of internal processing that will lead to rapid, obstacle free learning” (p.11). If this is the case, and we see this kind of learning as a feature in digital gaming, than we would expect to find that games employ the events effectively, even if they use novel strategies to do so.

Gagne’s events are not intended to be a rigid sequential list of requirements but rather as recursive tool that can be used out of sequence and with varying frequency throughout the instruction process (Hirumi et al., 2010). The events are designed to be adoptable and malleable to any instructional setting.

As an educational psychologist, Gagne sought to stipulate the typical instructional events needed for effective learning to take place, which provides us with a systematic ‘checklist’ of key design steps to consolidate the instructional design and delivery process (Good & Brophy, 1990). While Gagne’s seminal work in this area did not account for the new media resources and tools for instruction that are emerging today, these nine events, listed below, are still used and relevant for instructional designers within digital settings. Moreover, they should still apply in new media settings:

Gagne’s Nine Events of Instruction	
1. Gain Attention	6. Elicit Performance
2. Inform of Objectives	7. Provide Feedback
3. Stimulate Recall	8. Assess Performance
4. Present Stimulus / Lesson	9. Retention and Transfer
5. Provide Learner Guidance	

Figure 1. Gagne’s Nine Events of Instruction (Gagne, Wager & Briggs, 1992).

By examining emergent game design through the lens of Gagne’s Events of Instruction, our intent is to not only confirm that these events are still relevant in digital media, but also to explore if game designers are abandoning, adding to, or complementing these events in interesting ways. Becker (2008) postulated that game elements can directly and indirectly embody all elements in Gagne’s Nine Events of Instruction. By using the commercial game *Phoenix Wright: Ace Attorney*, Becker (2008) argued that games are a medium that is potentially apt for the implementation of

many classic instructional models, yet the models may be *embedded* in the ongoing play of the game. Further, Gunter, Kenny, and Vick (2006) suggest that in non-educational games, event three (stimulate recall) and event nine (retention and transfer) are often non-existent, but the remaining seven events share numerous commonalities with the principle components traditionally seen in game design.

We propose that a deeper method of artifact analysis will demonstrate that all of Gagne's events are evident, however these events may be embedded in the game-play throughout the game.

Method

This study uses artifact analysis methodology to explore the alignment with commercial games with instructional design principles. Artifact analysis is an unobtrusive method to collect information of interest that provides rich and thick descriptions of the artifact of interest (Norum, 2008). We modified Norum's methods for artifact analysis to use Gagne's Events of Instruction as the theoretical framework for analysis of a gaming media artifact.

For a compelling study, we sought a gaming media artifact that would be generally accepted as both relevant within the user market, or a 'successful' game, and is regarded as a challenging game or one with a complex semiotic system for players to master. After reviewing the top selling 50 games, we purposefully chose *Batman: Arkham Asylum* due to strong sales, recognition as for its critical acclaim and various nominations and awards including Game of the Year (Gaskill, 2010). *Batman* requires forty to eighty hours of game play to complete the primary objectives of the game; includes multiple play goals (story, action, exploration, and achievement); and requires players to use progressively complex strategies to overcome in-game challenges. Finally, *Batman* is a commonly known brand and as such can be expected to meet the commonly held expectations of the genre. Participatory fans, like those surrounding the *Batman* franchise, will often extend play, repeat play, build machinima, explore other media, and/or participate in online social networks outside of this time (Jenkins, 2009) to expand their interactions with the brand.

Typically, in conducting artifact analysis, researchers use pre-established models (Norum, 2008). Fleming's (1974) seminal model that provides a classification of the five basic properties of an artifact (history, material, construction, design and function) and a set of four operations (identification, evaluation, cultural analysis and interpretation) that are performed on these properties is an example of a framework commonly used to conduct artifact analysis. However, traditional models do not lend themselves well to new media artifacts. Specifically, for digital products, there is no physical material to examine, nor a discrete "history" of the software, (though there may be of the brand), other than iterations of the product or expansion materials. Regardless of these difficulties, we see that digital media does lend itself well to two of the five basic properties, design and function—both of which provide a better understanding of the artifact.

Analysis began with the research team *playing* the game itself for over 160 combined hours (requiring assistance from veteran gamers to finish). During our initial play, we maintained collective journals of observations and specific examples of instructional design embedded in the game itself. After a full play-through of the game, we returned to the *first hour of play* and collectively replayed it 19 more times. This first hour is the core instructional part of the game. The instructional objectives are to establish player understanding of the controls, core game mechanics, usable tools, play-mode options, and introduce feedback and trophies for both novice and expert play.

After individual game play, researchers gathered for analysis of the data on a weekly basis over a three-month period. Progressively, all data was operationalized to identify the Events of Instruction; evaluate coherence of framework in digital media; conduct a cultural analysis of the artifact; and interpret application and use of instructional design events. Data points were limited to observations that could be identified and shown in the artifact itself (using a screenshot, award, or completed sequence of play). Final working of the data included identification of clear and compelling points to illustrate digital instructional design. Data was sorted into nine themes that mirror the Events of Instruction.

Findings

Gain Attention

Batman: Arkham Asylum makes extensive use of Gagne's first principle of instruction, which is to gain the attention of the learner. In addition to using sound production to gain immediate attention, *Batman: Arkham Asylum* employs a system of cinematic cutscenes to introduce new tasks or sections of the game. These cutscenes use three dimensional rendering and professional voice acting to create an immersive experience.

Inform of Objectives

When it comes to describing the goals of the game, *Batman: Arkham Asylum* uses expository story telling interspersed with player controlled progressions. The game alternates between cinematic cut scenes and basic movement training. To advance the introductory sequences, the player must master the controls and skills of Batman the character. Narrative is played out during the cutscenes and the player is given a narrative story in which to frame objectives and new key characters. These help to clarify actions that he or she is expected to learn or problems that he or she expects to solve.

The implicitness of learning objectives is one of the unique methods of implementing instruction through a gaming experience. Gagne's Events of Instruction implies an explicit introduction of learning objectives to the learner. It is an empirical question to determine whether implicit or explicit learning objectives are superior in terms of achievement and motivation. However, it is clear that game designers often mask their learning objectives by embedding them within gameplay.

Stimulate Recall

In order to stimulate the recall of prior knowledge, *Batman: Arkham Asylum* utilizes a reminder system that is similar to the way that the information is initially presented. If the player struggles later in the game, the pop-up reminders (above) return to help the player – requiring programmer attention to tracking performance and having the game recognize when the player requires recall help. This can be seen in the Counter Punch action. This is also an example of Gropper's progressions (providing and then fading cue support).

Present Stimulus / Lesson

Batman: Arkham Asylum presents material to be learned by the player within the play of the game in a variety of ways. The first is in information that is gained during the cutscenes, as noted above. Along with clever challenges, the player is directly addressed to learn new lessons. This direct approach is used more commonly at the beginning of the game.

The second presentation type in *Batman: Arkham Asylum* is a just-in-time style of instruction that shows the keyboard and mouse combinations for a specific action that can be taken by the player as Batman. As noted above, these instructions pop up on the screen as certain movements became possible for the player to perform.

Provide Learner Guidance

Detective mode, once taught is a key resource for providing learner guidance. At any time in the game, Batman can switch to a lens called detective mode. This transforms the entire view of the world into grey and blue tones, but makes usable objects stand out in a glowing red-orange color. In this mode the player is able to see contextual clues about what they were meant to do next by looking at the different color highlighting on objects.

When a player dies during gameplay, he or she is given timely feedback on where they went wrong. This example shows what went wrong in-game, "You were seen and the hostage was killed," which reiterates the primary objective of the sequence. The second portion, suggests a

strategy to the player, “Approach Zsasz from the rear” that can help the player with a new tactic if they need a new direction. In this particular example, approaching from the rear requires a more subtle, and Batman-like, set of actions.

The difference between this and most forms of instructional feedback is in the delivery method. The instructional sentence was small on the screen, where the feedback (after defeat) is prominent on the screen, provided immediately after an error in play, and accompanied by villain mockery – that is a kind of reward to experience. The cost of failure is minimal and only delays play a few moments. The player is quickly returned to their most recent save point and is able to try again.

Elicit Performance

Batman: Arkham Asylum makes heavy use of eliciting performance from the players. After each skill is presented, the learner is given a sequence in which they can practice their newly acquired skill several times. Skills also compound throughout the game. These practice opportunities are at an easier level than the general gameplay, yet players can choose to enter a practice mode for combat outside the game. Creating a non-narrative practice portion of the game is slightly different from providing cues within the main game. Players must choose to exit the game to enter the practice sessions with the intent to improve their performance specifically and knowing that it will not progress their in-game progress in any way.

Provide Feedback

A variety of positive feedback is given when players progress and overcome challenges within the game. First, by defeating opponents, the player is able to clearly see their improvements and gain a firm grasp on what actions are effective and which are not. The player successfully getting through various sections in the game is a sign of success and improvement in skills and abilities. The narrative of the story is also a form of feedback that advances the player through a compelling and twisting mystery style plot line.

It should also be noted, that surrounding the game itself, we identified a community of expert gamers that took the time to video capture segments of game-play and post them online for others to review and comment on. This external online community is an easily overlooked, but core social aspect to gaming media as part of a larger participatory culture (Steinkuehler & Williams, 2006; Jenkins, 2009). Though the production company doesn't overtly design this space, it actively served to motivate this research team toward expertise and participation.

Assess Performance

There are several ways in which performance was assessed during *Batman: Arkham Asylum*. The first way is through the game's level of completeness. The achievement system shows both novice completion of essential skills and tasks, but also includes a layer of 'badges' that recognizes expert and highly demanding optional challenges.

Another method of assessing and rewarding performance is also available through the experience point system in which the player can unlock certain upgrades after they had gained points through defeating opponents. New gadgets are uniquely rewarding, and provide completely new options within the game--making them awards and challenges at the same time.

To contrast this, boss battles are challenges for the player in which they are faced with a villain, who is notable within the Batman universe. They are both end-of-chapter challenges and rewarding for Batman fans to encounter. These battles stand as tests to the player and, once the player finished a boss battle, they are 'passing' part of the game.

Retention and Transfer

Batman: Arkham Asylum provides enhanced retention and transfer through copious practice and a spiraling learning design. Once a skill is learned and the initial practice opportunity has passed, continuous chances for practice are rooted in the game-play. There are also transfer

situations. For instance, while the player might have learned to grapple using gargoyles, they are later expected to apply these abilities to walls and other objects. In addition, skills learned in the first instance of *Batman: Arkham Asylum* are also key game mechanics in the follow up *Batman: Arkham City*. Retaining and transferring knowledge from one game to the next provides useful expertise within the game

Conclusions

Each of Gagne's Nine Events of Instruction were identifiable within *Batman: Arkham Asylum*. *Batman* clearly requires learning to master, and game designers developed an instructional design that artfully and effectively gains the player's attention, informs, stimulates recall, presents stimulus, provides guidance, elicits performance, provides feedback, assesses performance, and rewards retention and transfer of gaming mastery. Using Gagne's Events of Instruction as a framework for assessing a game we argue that *Batman* is a strong model of an instructional design in addition to being an award winning and top selling gaming media.

Our analysis showed two strengths with the instructional design that we suggest are uniquely amplified by the digital nature of the instructional design and can be universally applied to digital media instruction. Namely *Batman: Arkham Asylum* was exceptional at encouraging trial and error, and embedded, context specific support.

Ultimately, we find that there are natural parallels between instructional design and video game design. It appears that the game focuses uniquely on applied practice, story telling, and embedded and contextualized support to further gameplay and assist in the generation of "flow". We encourage the examination of traditional instructional designs in an attempt to use and experiment with these attributes to leverage the attractiveness of gameplay for the learner. Though the two fields appear different at first glance, there is a great potential for both of them to inform and improve each other in the future. We suggest, that in future instructional design that these events are not just additional, but core game events that cultivate mastery of the digital space, problem solving, and trial and error learning.

References

- Batman: Arkham Asylum: OS X [Computer game]. (2011). London, England: Rocksteady Studios.
- Becker, K. (2008). *The invention of good games: understanding learning design in commercial video games* (Doctoral dissertation). Retrieved March 5, 2013, from ProQuest University of Calgary. Alberta, Calgary.
- Collett-White, M. (2013). Music sales post small rise in 2012, first since '99. *Reuters*. Retrieved March 5, 2013, from <http://www.reuters.com/article/2013/02/26/entertainment-us-global-sales-idUSBRE91P0F320130226>
- Fleming, E. M. (1974). Artifact study: A proposed model. *Winterthur Portfolio*, 9, 153-173.
- Gagné, R. M., Wager, W. W. & Briggs, L. J. (1992). *Principles of instructional design* (4th ed.), New York: Holt, Rinehart and Winston.
- Gaskill, Jake (March 19, 2010). "Batman: Arkham Asylum Wins BAFTA Game Of The Year". *G4*. NBCUniversal. Archived from the original on April 2, 2013. Retrieved August 10, 2013.
- Gaudiosi, J. (2012). New reports forecast global video game industry will reach \$82 billion by 2017. *Forbes*. Retrieved March 5, 2013 from <http://www.forbes.com/sites/johngaudiosi/2012/07/18/new-reports-forecasts-global-video-game-industry-will-reach-82-billion-by-2017/>
- Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. New York:

Palgrave/Macmillan

- Gee, J. P. (2011, June 14). *Presentation keynote*. Presented at GLS 7.0 2011 Games + Learning + Society Conference. Madison, WI.
- Germain, D. (2012). 2012 box office its record \$10.8 billion: Ticket sales increase for first time in 3 years. *Huffington Post*. Retrieved March 5, 2013, from http://www.huffingtonpost.com/2012/12/26/2012-box-office-record_n_2364620.html
- Good, T., & Brophy, J. (1990). *Educational Psychology: A realistic approach*. New York: Holt, Rinehart, & Winston.
- Gunter, G. A., Kenny, R. F., & Vick, E. H. (2006). A case for a formal design paradigm for serious games. *The Journal of the International Digital Media and Arts Association*, 3(1), 1-19.
- Herriot, R. E., & Firestone, W. A. (1983). Multisite qualitative policy research: Optimizing description and generalizability. *Educational Researcher*, 12(3), 14-19.
- Hirumi, A., Appelman, B., Rieber, L., & Van Eck, R. (2010). Preparing instructional designers for game-based learning: Part 1. *Techtrends*, 54(3), 27-37 .
- Jenkins, H. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. The MIT Press.
- Lenhart, A., Kahne, J., Middaugh, E., Macgill, A., Evans, C., & Vitak, J. (2008). Teens, video games and civics: *The Pew Research Center*. Retrieved March 5, 2013, from <http://www.pewinternet.org/Reports/2008/Teens-Video-Games-and-Civics/01-Summary-of-Findings.aspx>
- Norum, K. (2008). Artifact analysis. In L. Given (Ed.), *The SAGE encyclopedia of qualitative research methods*. (pp. 24-26). Thousand Oaks, CA: SAGE Publications.
- Rieber, L. P. (1996). Seriously considering play: Designing interactive learning environments based on the blending of microworlds, simulations, and games. *Educational Technology Research and Development*, 44(2), 43-58. doi:10.2307/30221022.
- Steinkuehler, C., & Williams, D. (2006). Where everybody knows your (screen) name: Online games as "third places". *Journal of Computer-Mediated Communication*, 11(4), 885-909.
- Steinkuehler, C., & Duncan, S. (2008). Scientific habits of mind in virtual worlds. *Journal Of Science Education & Technology*, 17(6), 530-543.
- Yin, R. K. (2008). *Case Study Research: Design and Methods*. Thousand Oaks, CA: SAGE.