Gaming in the Classroom: The Next Big Thing or Hogwash?

Ryan Leach

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Even as a child, gaming always fascinated me. Much like reading, gaming allows the gamer to be transported to an alternate reality or timeline in which the fantastic was not only possible, but probable. Even in the late 1980s and early 1990s the promise of video gaming was fantastic. Long gone were the days of simplistic games such as Pong and Donkey Kong representing the zenith of electronic entertainment. As time progressed, so did the complexity of gaming hardware.¹ For example, the grandfather of all personal gaming electronic devices, the Atari 6500 series, launched on a then impressive 128 bytes of ram.² By comparison, Microsoft’s current console, the Xbox One has 1.2e+10 bytes of ram.³ Once crude, simplistic, and shallow, gaming devices had transformed into modern marvels of computer engineering and design.

In parallel to the rapid advanced in computer hardware, computer software experienced a golden age as well. What were once crude approximations of relatively simple things, such as Pong’s emulation of two dimensional ping pong, were supplanted by (seemingly) living, breathing, evolving worlds a-la Bethesda Softworks’ Skyrim or Rockstar’s Grand Theft Auto series. Over the course of several decades gaming had had evolved into something far more complex, deep, and rewarding. In simpler terms, progressive iterations of technology seemed to make anything and everything possible in the digital domain.

¹ Popular video gaming’s modern history started with the Nintendo Entertainment System (NES), which later replaced by the aptly named Super Nintendo Entertainment System (SNES). Sega entered the market with their groundbreaking Sega Genesis, Sega Saturn, and Sega Dreamcast gaming consoles. Not to be outdone, Sony created the Sony PlayStation (1-4) which spurred its longtime rival Microsoft to develop its XBOX series of gaming consoles. All of these home game consoles were manufactured and distributed in parallel to the personal home computer, which underwent an even more impressive explosion of computing capacity and capability.


Luckily—for me—the timing of my birth coincided with this renaissance in personal electronic devices and software. Yet as I grew and matured, I experienced an interesting change in my relationship with, and view of, gaming. What had once been a means to escape from the mundane nature of life in the Midwest gradually, perhaps imperceptibly evolved into something altogether different. Much to my chagrin, as I moved away from simple, party style games such as Mario Kart and Mario, towards more complex games of strategy I began learning things about economics, politics, strategy, and even math. Although my specific taste in games led me towards a sub-genre known as 4X games which revolved around the four-step process of exploring, expanding, exploiting, and exterminating digital opponents, my supposition is that my gaming experience was not altogether different than the average young man or woman that grew up with games.4

Again luckily—for me—my personal interests in electronic entertainment paired nicely with my profession of choice as well as my academic interests and training. After my arrival here at the United States Military Academy at West Point as an instructor in the Defense and Strategic Studies division of the Department of Military Instruction it became clear that there was a need for increased Cadet engagement with strategic concepts.5 Although there was a degree of combat modelling present within the curriculum, there was nothing that could truly be described as gaming within Defense and Strategic Studies.

This raised some interesting questions in my mind. Could gaming solve the Cadet engagement problem I was observing? Could gaming be used as a tool to actually teach? Or was it simply a clever way of distracting oneself from the serious business of learning? If there was something to bringing games into the classroom, had it been done before? What were the best practices? And pitfalls to avoid? Is there a place for gaming here at the academy? Is it within the classroom or as a hobby? All of these questions are centered around a central question: what role does gaming have in the classroom? This literature review is an attempt to begin to answer some of these pressing questions.

5 This claim is based on my personal observations within the classroom as well as from a cursory study of Cadet end of course feedback derived from surveys and Course Director end of course evaluation reports. Further study of this area is warranted to better understand the situation and determine if it is indeed a problem and if it is isolated within the Defense and Strategic Studies program.
One challenge I encountered throughout this project was that most of the authors were what I refer to as “gaming positivists,” that is, those that were seemingly convinced of the virtues of gaming before they contemplated bringing it into their classrooms. In a way, this makes sense. Who would add something they despised to their pedagogy? Although logical, it presents a challenge that should be considered when reviewing the literature and this review of it: the authors may have reached their conclusions without sincere critical thinking and academic rigor. Another challenge that was immediately apparent was the lack of scientific rigor present in virtually all of the works analyzed here. There were precious few actual studies in the true sense of the word. Instead, most of the works reviewed here consisted of teachers’ and other professionals’ personal experiences and anecdotes regarding the merger of their personal gaming experiences with their professional responsibilities, both in and out of the classroom.

Despite this challenge or limitation of the literature, there are themes present throughout the works. I found the literature on the subject can be divided into two broad areas. First—and despite my critiques above—some researchers and practitioners endeavored to ascertain the utility of gaming in the classroom. Although they universally found that gaming was beneficial, there was at least the appearance that some of the authors were at least open to the idea of questioning the value or utility of gaming as it relates to learning. The second broad area presented in the literature covers the successful implementation of gaming in a learning environment. Here too, much of the research and analysis tends to agree, and although not outrightly stated, there are some basic trend lines for successfully deploying and employing games in the classroom environment.

The Utility of Gaming

Patricia Bruder’s take on gaming, entitled “Game on: Gamification in the Classroom” appeared in a 2015 edition of The Education Digests. Her work centered on making gaming work in the classroom and provided educators with several resources to help realize their classroom-based gaming outcomes. Additionally, she outlined what she described as “five benefits of adding gamification to classroom,”

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6 For an example of such a gaming positivist perspective see Young Kyun Baek, “What Hinders Teachers in Using Computer and Video Games in the Classroom? Exploring Factors Inhibiting the Uptake of Computer and Video Games,” CyberPsychology & Behavior 11, no. 6 (2008): 665–671. Even the name implies the finding, that video games and computers are the answer to some pedagogical problem, but the human component, in this case the teacher, is simply failing use the tool appropriately or to maximum effect. While this particular case is relatively benign in that it offers educators concrete solutions to real-world problems, it takes for granted that video games and other electronic education aides are beneficial to student outcomes.
which she defined as:

1. Boosts enthusiasm toward math
2. Lessens disruptive behavior,
3. Increases cognitive growth,
4. Incorporates mature make-believe which encourages growth and development, and
5. Improves attention span through game-centric learning.\(^7\)

Bruder also pontificated on what makes games interesting, ultimately concluding that a high quality game is one that is continuously challenging, offers interesting storylines, is flexible (insofar as it allows for multiple ways to win, provides “immediate and useful rewards,” and offers a compelling mix of realism and fun.\(^8\) Although Bruder’s work errs on the side of utility and equipping educators with the proper tools for bringing games into the class, it makes up for this particular shortcoming with its clear and concise prose and highly useful tips for would be teacher-game masters.

Although separated by time and fields of study, Bruder’s work is related to that of Lynda Cessario. Her 1987 article in the *Journal of Nursing Education* title “Utilization of Board Gaming for Conceptual Models of Nursing” offered a similar take on the field of gaming. Cessario opined on the virtues of gaming, stating that the three major attributes of gaming were:

1. Activity is provided which both students and educator may participate.
2. It is very often problem oriented and helpful in the development of interdisciplinary approaches as well as often involves social skills which relate to the world outside the classroom, and
3. It is a technique which requires the learner to be flexible and to adapt to changing circumstances.\(^9\)

As you can see, both authors outline benefits of gaming that are broadly similar but also subtly different in important ways. Where Cessario really makes her mark however, is in her drive to take game out of the realm of “the education of younger children,” and

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\(^7\) Patricia Bruder, “Game on: Gamification in the Classroom,” *The Education Digest* 80, no. 7 (2015): 57.

\(^8\) Ibid.

bring it into the real-world by applying it to vocational training of nurses. Cessario believed that gaming could be incorporated to create “an effective teaching strategy for reinforcing and motivating students to learn.” In the end, she believe that:

Board gaming can make learning a pleasant experience. It provides students and educators an opportunity to interact in an informal atmosphere and provides enjoyment, while at the same time may promote learning. Therefore educators should consider further development of games for use with students in nursing education.

Cessario wasn’t alone in her belief that gaming had applications beyond the “edutainment” of school age children. In fact, this is a recurring theme throughout the literature. Aaron Clark and Jeremy Ernst’s *Journal of STEM Education* article “Gaming Research for Technology Education” basically took Cessario’s supposition and extended it to science, technology, engineering, and science education. The researchers’ central aim was to examine if and why gaming should be implemented in secondary education of STEM students. Their study was by far one of the most robust research projects and included a fairly wide field survey and experiment. The results did not disappoint and found overwhelming evidence that those teaching, working, and learning in STEM fields believed that gaming was a valuable resource as a learning tool for students. Specifically, 74% of their respondents indicated that they either agreed or strongly agreed in the potential of gaming to aid educational outcomes. Further, 72% of respondents either agreed or strongly agreed that “outside classroom assignments that use computer-video gaming development could be useful for student learning.” Unsurprisingly then Clark and Ernst concluded that gaming “can be a useful tool for gaining and maintaining student interest in all areas of STEM education.”

10 Ibid.
11 Ibid., 169.
12 Ibid.
14 Ibid. Their conclusion continued thusly: “The self-reported information provided by the participants of the study indicates that many would invite gaming to become a part of the pedagogy used in our schools and as a means to reinforce what is being taught. The discipline of Technology Education is one area that sees this need and the authors encourage technology teachers to pursue the integration of gaming into their existing curricula. Keeping in mind that the population for this study came from targeted backgrounds in technology or related fields and had a direct interest in subjects like gaming. The researchers conclude that there is an apparent need for utilizing gaming as
The oldest article reviewed in the literature was from Bernard Cohen who wrote “Political Gaming in the Classroom” in a 1962 *Journal of Politics*. Cohen’s piece was not only interesting because of its content (although the content was also engaging), but also because of its early appearance. Many in the gaming community seem to believe, or at least give off the appearance that they believe, gaming to be some sort of recent invention of modern pedagogy. Cohen and others clearly indicate the opposite. This makes sense, as play and modelling are not new behaviors and likely date back to antiquity but were simply known by another name or another concept entirely. For Cohen’s part he reminds readers that previously gaming would likely be referred to as “role-playing,” or modeling such as occurs at a Model United Nations or League of Nations sessions.15

If most of the field can be labelled gaming positivists, Cohen can be labelled as something of a gaming skeptic. Although he clearly understood that gaming had some advantages, such as cross-pollination from other disciplines and the forced interaction of students from different backgrounds, he was largely skeptical of the grandiose claims of gaming’s most ardent supporters. Ultimately Cohen concluded that “for until there is more acceptable evidence of what games actually contribute to the learning process, and to theory development, the future of gaming will be justifiably uncertain.”16

Cohen was not alone in his era. Nancy Roberts also writing in the 1970s Roberts wrote published her master’s thesis “Simulation Gaming: A Critical Review” in 1976. Interestingly, she places “gaming as a training device” as far back as the 15th Century when “chess was often used to train military officers.”17 Besides that interesting tidbit, Roberts came to similar conclusions about the benefits of gaming. She argued that:

1. Students learn at least as much at the cognitive level from games as from other methods of instruction
2. Interest and enjoyment is higher in learning situations using games.

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a vehicle for STEM subject matter delivery, as well as a motivator for students. It is a necessary instructional area evidenced by the expansion of the gaming industry and its need for an educated and skilled workforce. Therefore, more research is needed in this new and emerging area of education to develop new strategies for reaching students in the 21st century.

16 Ibid., 381.
3. The teacher’s classroom role tends to shift from a center-front focus to a learning facilitator.
4. Games provide children with opportunities to try out other roles in life and to experiment with problems they have not yet encountered. These exercises appear to give children more of a sense of control over their futures, which seems to be a crucial factor in school success.\textsuperscript{18}

Yet unlike most of the others (excluding gaming skeptic Bernard Cohen described above), Roberts was also very critical of gaming and highlighted some of its most glaring drawbacks:

1. In games requiring role-playing, the players sometimes succeed in becoming absorbed in their roles and sometimes do not. When players cannot empathize with their assigned roles in the games, success is lessened. Games often have passive role requirements which players usually find boring.
2. Roleplaying games tend towards similar design characteristics so that after playing several games the structural differences among them blur.\textsuperscript{19}

Ultimately however, Roberts sided on the side of the gamers. She concluded that games had “become a standard part of new curricula” and that it was “incumbent upon designers and developers of curricula using games to evaluate and build” games that strengthen learning objectives in a meaningful way. In simpler terms, she believed that while game was probably here to say, prospective game masters needed to do more to get the most out of the experience for their students.

Dana Ruggiero writing for the \textit{Games for Learning Workshop of the Foundations of Digital Games Conference} in 2013 authored “Video Games in the Classroom: The Teacher Point of View” clearly did not share the same skeptical spirit of Roberts and Cohen. Ruggiero studied teacher perception of gaming in the classroom and revealed that “gaming is a good use of technology for engaging [sic] motivating students in classroom learning.” Despite finding overwhelming evidence that teachers valued gaming in the classroom, “less than half of the in-service teachers use gaming in their teaching.” Said another way, most people seem to think gaming in the classroom is a good idea, but precious few seem to know how to do it.\textsuperscript{20} Ultimately Ruggiero concluded that “the focus should be on implementation, the design of the curriculum

\textsuperscript{18} Ibid., 17-18.
\textsuperscript{19} Ibid.
around the games, and the actual classroom use of the games. This would help educators and administrators who are considering implementing games in the classroom and increase successful learning experiences."21

How to Successfully Implement Gaming in a Learning Environment

Young Kyun Baek’s 2008 article in *CyberPsychology & Behavior* seemingly picks up where Ruggiero’s argument or supposition was headed (although it was written 5 years before). In “What Hinders Teachers in Using Computer and Video Games in the Classroom? Exploring Factors Inhibiting the Uptake of Computer and Video Games.” Baek studied the factors that inhibited “teachers’ use of computer and video games in the classroom setting” to “examine the degree to which teaching experience and gender affect[ed] attitudes toward using games.”22 Baek discovered six factors that he believe hindered teachers’ use of games in the classroom: “Inflexibility of curriculum, Negative effects of gaming, Students’ lack of readiness, Lack of supporting materials, Fixed class schedules, and Limited budgets.”23 Interestingly, the six factors did not effect all teachers equally. The researcher noted:

Lack of supporting material, Fixed class schedules, and Limited budgets were factors that female teachers believed to be more serious obstacles to game use in the classroom than male teachers did. Experienced teachers, more so than inexperienced teachers, believed that adopting games in teaching was hindered by Inflexibility of curriculum and Negative effects of gaming. On the other hand, inexperienced teachers, more so than experienced teachers, believed that adopting games in teaching is less hindered by Lack of supporting materials and Fixed class schedules.24

Of still further interest, Baek found several negative effects (or at least the perception of effects) of gaming through his study. Many respondents to his survey indicated that gaming (specifically video-gaming) could have the following negative effects:

1. Prolonged gaming can be detrimental to the vision of a player.
2. Learning with games may contribute to a student becoming an addicted gamer.
3. A side effect of gaming can be student addiction.
4. Students may lose desire to master basic concepts requiring sincere learning caused by the negative effects of teaching with games.
5. Teachers cannot control students once they are immersed in gaming.

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21 Ibid., 6.
23 Ibid.
24 Ibid.
6. Gaming may result in excessive competition in the classroom.\textsuperscript{25}

So it seems that according to this study at least, bringing games into the classroom faces a somewhat uphill battle at least in some parts of the country with some demographics.

Shira Chess and Paul Booth’s 2014 “Lessons down a Rabbit Hole: Alternate Reality Gaming in the Classroom” prepared for \textit{New Media & Society} addressed some but not all of Baek’s findings and critiques. Chess and Booth believed that “Alternate Reality Games,” that is, those in which a game “creates a game space from real-world locations by relying on information, both online and offline, to physically involve players in a game “space” could be used to “reinforce classroom knowledge by encouraging collective learning practices and focusing on new media literacy skills.”\textsuperscript{26} Further, they argued that the:

affordances of Alternate Reality Games are best integrated within a “play-revise-design” format. By appropriating this emerging format in classroom spaces, we hope to teach students concepts such as new media literacies, the values of “safe failure,” and social learning, while giving students the tools for interactive storytelling.\textsuperscript{27}

Chess and Booth offer a different take on gaming than Baek. Although it is outside of the scope of this research project, there clearly seems to be a cultural and generational divide between those like Chess and Booth and those researchers and authors like Baek.

Aaron Delwiche’s “Massively Multiplayer Online Games (MMOs) in the New Media Classroom,” prepared for \textit{Educational Technology & Society} examined “findings from two MMO-based courses in the context of situated learning theory.” His first course “focused on the ethnography of on-line games” and “used the game Everquest as a vehicle for teaching research methods to 36 students in an undergraduate communication course.” Delwiche’s second course used the game “Second Life to teach the fundamentals of videogame design and criticism.”\textsuperscript{28} In the end he recommended that:

potential virtual environments be selected on the basis of genre, accessibility, and extensibility, it is suggested that game-based assignments are most effective when they build bridges between the

\textsuperscript{25} Ibid., 667.
\textsuperscript{27} Ibid.
\textsuperscript{28} Aaron Delwiche, “Massively Multiplayer Online Games (MMOs) in the New Media Classroom,” \textit{Educational Technology & Society} 9, no. 3 (2006): 160.
domain of the game world and an overlapping domain of professional practice.29

This echoed some of the points made by other authors and lines up with a common-sense approach to integrating gaming in the classroom: gaming isn’t a magic bullet that will fix all of a teacher’s woes, but merely a useful tool that a skillfull professional can use to great effect if they so choose.

Conclusion

Even a cursory review of the literature pertaining to the use of gaming in the classroom yields important and interesting conclusions. First, there generally seems to be consensus amongst practitioners and researchers that there are real and verifiable benefits to including gaming and games in the classroom ranging from increased student engagement to better knowledge retention and educational outcomes. This conclusion is backed up by the far broader study of gaming literature conducted by Dempsey et al.30 Second, that gaming is highly adaptable to practitioner needs and desires. In other words, gaming and games can be modified to fit real-life use cases across a wide variety of subjects in disparate fields. This is somewhat counter to the conventional wisdom that games are better suited to teach particular subject areas. While some fields may benefit more than others, all fields of study seem to benefit from increased student engagement and educational outcomes. With this new knowledge in-hand, I am better prepared to include gaming in my classroom, and plan to do so earnestly in the upcoming terms!

29 Ibid.
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