Games in the Classroom: Motivation, Use, and Effectiveness

Hoang Nguyen
Old Dominion University

Abstract

This report studies the use of games in the classroom, with focus on a few elements: the motivation of students in playing games, the use of such games in the classroom, and their effectiveness on student learning. This report does not define a game by any strict means, rather only generally as an activity that is non-traditional in its teaching approach. The traditional method is by means of lecture, textbooks, notes, etc. Furthermore, while this paper draws on research conducted in various fields of study and from K-12 onward (not exclusively higher education), the ultimate purpose is to see how games can be utilized in the classrooms of English departments. In addition to the research conducted by experts that is reviewed, personal research was conducted in the form of a survey.

Background

The use of games in the classroom as a means of teaching is an up and coming idea that is seeing more and more usage as teachers recognize the effects that games have on student learning. Games come in many forms, not just the typical computer or video game that one typically jumps to upon hearing the word. Subject-centered recreations of the popular quiz show *Jeopardy!*, classroom simulations of key concepts, and others are all valid forms of a game. This report does not compare the effectiveness of one type of game over another.

When attempting to assess the effectiveness of playing games in student learning, it's important to first determine the motivation of students when faced with this alternative method of learning. "Well-motivated students learn better" as Stege et al. (2011) put it. Traditional methods by way of lecture, text, and note-taking remain the dominant presence in learning and is what most students are used to. This familiarity provides both a sense of comfort to students who find success in the traditional methods and a sense of apathy to students who long for a break from the tedium. Indeed, not all students meet a day of playing games in the classroom with enthusiasm. When Squire (2005) introduced the computer game Civilization III into his high school history class, he found to his surprise that most of his students questioned the value of the game in learning instead of leaping at the opportunity to engage in play. Squire (2005) also found that the minority (around 25%) that reacted positively to the idea of playing a game were the "academic underachievers" who had not found success with traditional methods of learning. Interestingly, some students in Squire's (2005) class "rejected the game experience in school…because playing Civilization III in a school context was compulsory." Similarly, Stege et al.'s (2011) research saw high school students who worked with traditional methods were more motivated with traditional methods than the ones who played games.

The reaction to playing a game seems to vary with age, however—seemingly a result of the amount of exposure students have had with traditional methods. A 2011 study of Iranian children learning English as a foreign language (EFL) found what is a more expected result: "children in the experimental group [who played games] were more motivated than children in the control group [who did not play games]" (Aghlara and Tamjid, p. 558). These children had not been exposed to the traditional methods as long as the previous studies' high school students. On a related note, when it comes to second-language acquisition, motivation plays a great part in the success of the learning process.

Secondly, it's important to look at how games are utilized to enhance the learning experience for students. Just as there are so many kinds of games, there are many ways instructors use them in their classrooms. The type of game does matter. Kenny and Gunter (2011) argued that when it comes to playing games, students have different levels of immersion depending on the game, and the level of immersion produces different results. Beyond simply interacting with a game and being familiar with the gameplay, full immersion in the game leads to "belief creation…which [Kenny and Gunter] affirm eventually translates into knowledge acquisition" (Kenny and Gunter, 2011, p. 262). Thus, certain games are more effective than others depending on how immersed students are in the game.

One way to utilize games in the classroom is as a direct substitute to the traditional methods of teaching. Instead of giving lectures to explain new material and expecting students to listen and take notes, instructors instead allow students to simply play a game that teaches them the same material. Stege et al. (2011) attempted just that, by allowing groups of high school students to learn about electrical engineering for the first time both through the traditional method of text and purely through playing a game designed to teach the same material as the

text. Aghlara and Tamjid's (2011) study also sought to replace traditional methods entirely with games when teaching Iranian children English vocabulary.

However, attempting to replace traditional methods entirely is something more fit for studies than for the real classroom. Both studies above lasted roughly a month. In a true class setting, which spans many months to a full year, it is more realistic for games to be incorporated alongside traditional methods than supplanting them. That is not to say games need to be short-lived like a day of review playing classroom *Jeopardy!*. As Squire (2005) demonstrated, it's possible to introduce a game throughout a whole course, incorporating it into the curriculum. Not surprising, however, is that not many teachers would be willing to do this.

A large part of how games are utilized in the classroom has to do with the instructors themselves and their familiarity and knowledge of the games and technology. For Squire (2005), who is familiar with Civilization III, utilizing its learning capabilities long-term is a possibility, but many teachers don't have that knowledge. Kenny and Gunter (2011, p. 269) found that for teachers, despite having access to computers, barriers still remained including "a perceived lack of time, poor technical support, outdated technologies, and time constraints imposed by rigorous class periods." Teachers are trained to impart the traditional methods of learning in their classrooms—it's what their students expect. Those who choose to utilize games do so by their own volition and their own judgment.

Lastly, the effects of playing games as opposed to traditional methods is the most important thing to look at. As admirable a cause as it may seem, what ultimately matters are the results. In Squire's (2005) study, the students who did manage to learn from playing Civilization III learned a great deal, even "seeing failure as a learning opportunity." They were able to "see game challenges…as a result of more factors" (Squire, 2005). However, those lacking motivation and interest in the game, finding only frustration instead, "elected to withdraw from the gaming unit" (Squire, 2005). Similarly, in Aghlara and Tamjid's (2011) study, the more motivated group of children playing games to learn English vocabulary performed significantly better than their non-motivated peers who did not play games. It should be reminded that Squire's (2005) students found more motivation through the traditional methods of learning. Thus, although motivation does play a role in students' learning potentials, it is the presence of games here that aided in the acquired knowledge.

A higher part of knowledge acquisition is knowledge retention. What matters in the long run is whether students will be able to retain the information they learn, not just for the purpose of test-taking but for future application and use. Most studies regarding games in the classroom deal with immediate results. As such, long-term retention studies are scarce. Rondon et al.'s (2013) study examined both the short-term and long-term effects of using games to teach students head and neck anatomy and physiology. Their study found that students who were taught using the game-based method performed better on the post-test, but students taught using the traditional method performed better on the long-term test six months later. This study, however, was conducted using a shared computer for the experimental group. Whether this prevented them from getting the full experience and affected the long-term results is unknown.

Method

Additionally, personal research was conducted to provide further data on the topic. The specifics of the research are as follows.

Participants

There were 16 participants in the study, all of whom fully completed a short survey. All participants were students from the summer Technical Writing course at Old Dominion University. No personal information from participants (e.g. age, gender, religion, etc.) was collected in this study, as this study is not meant to examine how playing games in the classroom affects different groups of people, only whether as a whole it bears an effect in some direction.

Materials

The study was carried out by means of a short survey on the site SurveyMonkey.com. All participants were asked to answer three quantitative questions and one qualitative question. There was no time limit when taking the survey, only a due date on which answers could be submitted.

The first question asked, "Would you rather learn through playing games or through traditional methods?" The possible answers were as follows: "Playing games," "Traditional methods," and "A combination of both." This question sought to determine the motivation of students when it comes to incorporating games in the classroom.

The second question asked, "How have games been used for learning in your classes?" The possible answers were as follows: "To fully teach new material," "To supplement or demonstrate new material," "To review old material; as test review," "A mixture of the above," and "Other." This question sought to examine for what purpose games are used in the classroom.

The third question asked, "Do you feel it's easier to retain information learned from playing games?" The possible answers were as follows: "Yes, I retain information more if it's taught through playing games," "No, I retain information less if it's taught through playing games," and "Playing games does not affect my ability to retain information." This question sought to determine the effectiveness of games in transferring information to students and helping them to retain the information for future use.

The last question asked, "What is one way playing games has helped or not helped you when taking a formal assessment?" Students were free to provide their own response to this question. It was meant to gather specific examples of using the knowledge taught by games in order to succeed in the class.

Procedure

The survey was hosted online on SurveyMonkey.com and a link made available for all students to take the survey. Their replies were collected and organized by the site and the results were then converted into charts using Microsoft Word.

Results

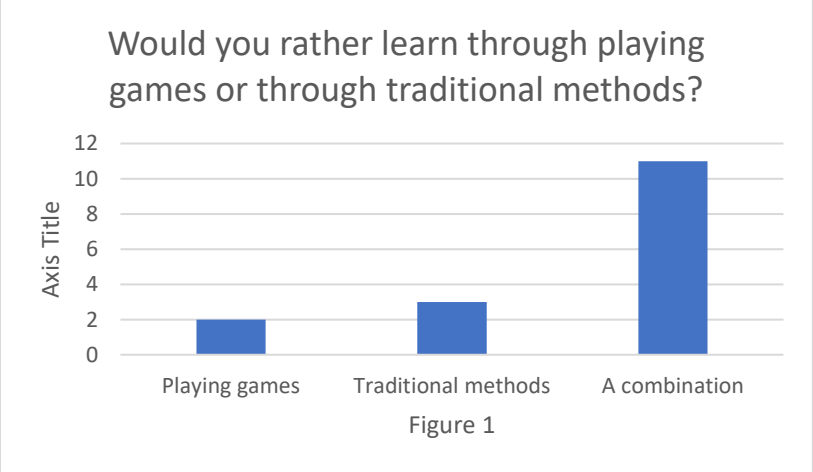

Figure 1

When asked about their motivation in playing games in the classroom, a great majority of students answered that they prefer to have a combination of games and the traditional methods. Only two students preferred playing games over the traditional methods, the fewest result.

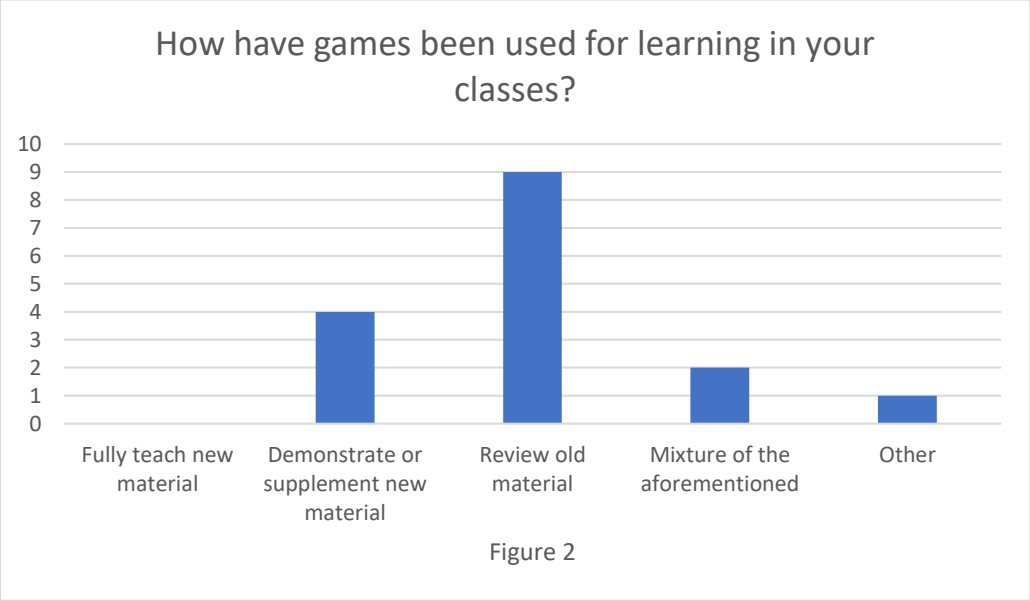

Figure 2

When asked how games have been used in their classes, most students answered that games were used as a study tool to review old material (typically before a test). A fair number had experiences with games being used to complement traditional methods. However, no student has ever had experience with new material being taught entirely through the use of games.

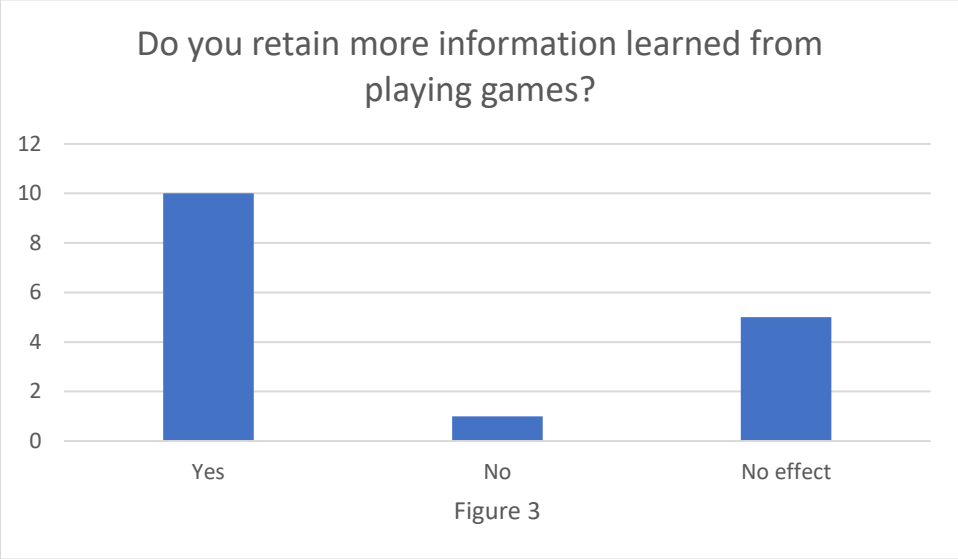

Figure 3

When asked whether students retain information better when playing games, a majority of students answered that they do retain more information from playing games. Half the amount answered that playing games has no effect on their ability to retain information. Only one student was negatively affected by playing games.

Table 1

What is one way playing games has helped or not helped you when taking a formal assessment?	
Positive	Negative/Neutral
In high school, I had several teachers that would play games the day before the class had a test and it helped me a lot to retain the information and prepare me for the next day's test.	Games have not had an impact on my formal assessments.
It has assisted me in retaining knowledge that I need for the exam.	It has never helped.
Playing games helps to encourage studying when used competitively.	
The ability to study materials and incorporate real life examples has been helpful.	
It has helped me by creating a new way to study. Traditional methods can be boring and less engaging.	
Lets me know if I need to review any information before an exam.	
Has helped me retain and process new information	
Quizlet helped me to retain Spanish vocabulary and spell it correctly.	
I am rewarded by beating the challenge of the game and thus retain the knowledge I learned because of the reward to it and the possibility that I will need to remember the knowledge I learned to further process in the game.	
Video games make the information more interesting and more applicable, so it is easier to retain.	
It can help break the tension or the monotony of a traditional class. This can be helpful in understanding the material instead of letting your brain glaze over and not fully engage with the information.	
Helps to the student to understand a difficult topic. Make the presentations more hands on and flexibility.	
I like to use games for review and to supplement new material	
In high school, we played Jeopardy-style games to prepare for upcoming tests. I think that helped me retain facts better.	

Answers to the qualitative question are grouped into two categories: answers where games have had a positive impact on the student and answers where games have had a neutral or negative impact on the student. An overwhelming majority of students recounted at least one instance where playing games helped them in the class or when taking formal assessments. Only two students answered that games have never helped them. Note that the two students did not answer negatively but rather neutrally.

Discussion

The personal research showed some interesting results regarding the topics of motivation, use, and effectiveness of games in the classroom. Squire (2005) and Stege et al. (2011) found that in their high school classrooms, students were more motivated by the traditional methods of learning, while Aghlara and Tamjid (2011) found that in children, there was more motivation to play games. Such a relation was predicted to have been the result of age and exposure to the traditional methods. The personal research (Figure 1) found that in the group of college students who took the survey, the majority of students preferred to have a combination of traditional methods and games in their learning approach. However, more students preferred a pure traditional method to a pure game-focused method. The expert studies did not ask whether students were more motivated to have a combination of both methods, but as far as the idea goes that older students prefer the familiar traditional methods, the personal research, by a small margin, supports it. However, most prefer to have a combination of the two methods.

When students in the personal research were asked about the ways in which games have been used in their classes (Figure 2), most students answered that it was used as a review tool for old material. Students in the qualitative question (Table 1) talked specifically about using *Jeopardy!* and Quizlet to review for upcoming tests. A fair number of students (Figure 2) also answered that games were used to complement the teaching of new material. No student has ever had any experience with a class where new material was taught entirely through the use of games. Therefore, studies such as that from Stege et al. (2011) where fresh learning comes as a direct result from playing games are a rarity in the actual classroom setting—and are non-existent in the personal research.

When dealing with the effectiveness of playing games, students were asked about their knowledge retention ability (Figure 3) as a result of playing games. Most of the students answered that they experienced a positive effect in their ability to retain information as a result of playing games. Half that amount answered that playing games had no effect on their ability to retain information, while only one student had a negative experience where playing games resulted in less information being retained. This is consistent with the findings of Stege et al. (2011), Aghlara and Tamjid (2011), and Rondon et al. (2013) that showed students subjected to the gaming method learned more information than those who were not. However, because the survey did not specify the length of time for which the student retained the information, it is unknown whether the results are short-term or long-term. Thus, there is no efficient evidence to confirm or challenge Rondon et al.'s (2013) finding that traditional methods have a larger long-term retention rate. The qualitative question (Table 1) also showed that nearly every student who played games had experienced at least one positive effect from the method, while no negative effect was shared—only a couple neutral non-effects.

Conclusions

From both the expert studies and the personal research, one thing is clear: traditional methods of learning are not going away anytime soon. Games are indeed on the move into classrooms as an alternative method of teaching, and for the most part students have a positive attitude toward

them, varying with age. Younger students are more eager to play games than older students. Most students do like having the alternative option available. However, their concern is the supplanting of the traditional method. They don't want it to go away because they're used to it and have found success in it. It's doubtful that playing games will ever fully replace traditional methods, and students don't want that. Choosing purely between the two methods, students still prefer the traditional methods. But the ultimate desire is to incorporate games alongside traditional methods to make a cohesive and more effective learning experience.

As a result of students' attitudes towards a game-centric curriculum, it seems most of the experience that students have is the use of games as a tool for test review, as well as a demonstration of or supplement to new material being taught. Instructors are not fully teaching new material to students purely through the use of games, even though short-term studies have shown better performance through the use of games in certain subjects. Both instructors and students are hesitant to fully abandon the traditional method, even if only for one unit. Games are on their way to being more acceptable, but it's still a way away.

The effectiveness of games, however, is very apparent. Students do tend to perform better and retain information better short-term when playing games. However, it's a rather specific and narrow field of progress because students are not being taught only through playing games. All that can be said is that games do help in learning, not whether games can fully replace lectures and textbooks. Perhaps the analysis of an entire course taught beginning to end through games only can shed some light. Still, when it comes to long-term retention, much more research needs to be done. Long-term retention is more important, as students often need to carry knowledge they obtain to future classes.

Recommendations

The studies and personal research all point back to how games can be used in English classrooms. First of all, games should be used merely as a tool to aid teaching, not to replace traditional methods. It is worth realizing that not every student is motivated to play games, so offer these as optional methods that students can either choose to explore or not.

As shown with second-language acquisition, games have proven very useful for vocabulary and spelling. It's not hard to imagine that there is a greater retention rate from playing games when dealing with L2 learning than simply gazing at a textbook for words and translations. Particularly when it comes to English as a Second Language (ESL) classes, using games seems to be a much better idea than pure textbook learning. Many computer games and programs exist that teach these things, from Reader Rabbit to Rosetta Stone.

English is not an area that's as hands-on as math or the sciences, where it's easy to have simulations that teach students while playing. However, role-playing is an important part that leads to the full immersion Kenny and Gunter (2011) believe is the greatest path to knowledge acquisition. Within the field of literature, role-playing can serve as a wonderful tool to help students better understand characters in a story. One genre of video games is the visual novel, where the player assumes the role of the protagonist and interacts with the story through his or her own choices, bearing the consequences of those choices. While it's doubtful such games exist for pure academic and educational purposes (e.g. a line of Shakespearean visual novels for use in high school classrooms), that doesn't stop instructors from being creative and designing their own non-digital game. More often than not, students simply read books in literature classes and try to rationalize the characters' actions, but becoming the characters in some form, such as real-life role-playing in the class, can lead to a better understanding of the characters and the literature.

Not all games have to be on the computer or utilize mainstream video games. Particularly for English, a discipline where creativeness is a key part, it pays for instructors to think of new ways to teach their students. The traditional methods are still important and students still embrace them, but being able to incorporate games alongside the traditional methods in creative ways allows for a much better learning experience for students. It can be done and it has been done.

References

Aghlara, L., & Tamjid, N. (2011). The effect of digital games on Iranian childrens vocabulary retention in foreign language acquisition. *Procedia - Social and Behavioral Sciences*, 29, 552-560.

Kenny, R., & Gunter, G. (2011). Factors Affecting Adoption of Video Games in the Classroom. *Journal of Interactive Learning Research,* 22(2), 259-276.

Rondon, S., Sassi, F. C., & Andrade, C. R. (2013). Computer game-based and traditional learning method: A comparison regarding students' knowledge retention. *BMC Medical Education*, 13(1).

Squire, K. (2005). Changing the game: What happens when video games enter the classroom? *Innovate: Journal of Online Education*, 1(6), N.p.

Stege, Linda, van Lankveld, G, & Spronck, P. (2011). Serious Games in Education. *International Journal of Computer Science in Sport*, 10(1).