Annotated Bibliography

Morgan E. Culp

Department of Education, The University of Tampa

EME 610: Trends and Issues

Dr. Suzanne Ensmann

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Biyun Huang, Khe Foon Hew & Chung Kwan Lo (2019) Investigating the effects of gamification-enhanced flipped learning on undergraduate students' behavioral and cognitive engagement, *Interactive Learning Environments*, 27:8, 1106-1126, DOI: 10.1080/10494820.2018.1495653

In this peer reviewed article the authors dive into previous research that gives evidence that a more hands off approach of teaching, such as the flipped classroom, has led to student disengagement and non-motivation. The study was done on a group of undergraduate students in an introductory science course. The study was seeking to find how effective gamified out of class activities are and if students would utilize them. Examples include: watching videos, completing pre-thinking activities online, and partaking in interactive quizzes. This was imposed without any incentive for students to complete these tasks, aside from learning/studying.

The results showed differences in cognitive engagement and behavioral engagement. The study showed a positive correlation with gamified strategies in pre and post class activities with a positive effect on student engagement, as they became more active outside of the classroom. The cognitive engagement was improved as well as time taken to complete tasks thoroughly shrank in the gamified study group.

Fotaris, P., Mastoras, T., Leinfellner, R., & Rosunally, Y. (2016). Climbing up the leaderboard: An empirical study of applying gamification techniques to a computer programming class: EJEL. *Electronic Journal of E-Learning, 14*(2),

94-110. Retrieved from

http://search.proquest.com.esearch.ut.edu/trade-journals/climbing-up-leaderboard-empirical-study-applying/docview/1804471664/se-2

The authors of this article conducted a quasi-experimental study exploring the impact of gamification elements and immersive learning in a computer programming class from the perspective of students. The study is based on theories from previous scholars that address the lack of students attention span after the first ten minutes of a lecture based class. They compare this attention span to the attention span of a gamer who is after an epic win who spends far beyond 10 minutes, even up to hours, glued to a screen and yearning to rank up or earn some reward. The authors discuss how the Self-Determination Theory (Ryan and Deci, 2000) is how gamification should be designed and utilized by using relatedness, competence, and autonomy to increase a learner's motivation–both intrinsic and extrinsic.

The study used Kahoot and the Who Wants to be a Millionaire game connected to a shared leaderboard that is accessible through Blackboard for all students to see how they rank. The results were collected using an online survey where students ranked how successful each portion of each game and component was to their individual success in the class and becoming motivated. It was found that the fast-paced nature of both games was a great self assessment check for students to see if their brain could find the information rapidly or if it was a study or subject area they might need improvement in. They also found success in the combination of individual and group competition within the class to accommodate for a diverse group. I found this

article interesting as I wanted to explore the logistics and intention behind using leaderboard strategies in gamification in higher education.

González-Fernández, A.; Revuelta-Domínguez, F.-I.; Fernández-Sánchez, M.R. (2022) Models of instructional design in gamification: a systematic review of the literature. *Educ. Sci. 12*, 44. https://doi.org/10.3390/ educsci12010044 .

The world of instructional design is evolving alongside the rapid growth of technology and new technological practices and techniques. Gamification is a practice that came about from years of studies and research to find out ways to keep students motivated, engaged, and wanting to be self-learners. The first articles exploring gamification in education surfaced around 2011 and are continuing over to current-day. The article I am summarizing was only published this month. New information and research surfaces daily as this instructional design trend continues in online educational instruction. Researchers found that game-like simulation combined with video elements for student learning in educational contexts, boosts individual and team involvement and motivations.

González-Fernández, Revuelta-Domínguez and Fernández-Sánchez evaluated and compared a number of gamification studies which took publications from all over the world to answer a set of research questions based around the term gamification, geographical distribution, methodologies and the teaching-learning process. Based on the scientific production studies that had relation to teacher training with gamification, they discovered that around half of the data came from Spain. The runners up in this

category are The United States and Brazil. The effects of gamification have been grouped and categorized into different categories that include student motivation, educational commitment, participation, attitude towards learning, perception of knowledge, academic results, and updating knowledge. Those are just some of the effects that have been studied this far, no one truly knows how gamification can benefit generations in the long run. Here, the study is focused on short-term outcomes of students during their class time-monitoring participation and effectiveness of the course.

I chose an article about gamification because it is something that interests me and it is newer to the world of instructional design. When I was in grade school, I don't remember partaking in many learning games inside of the classroom, the fun learning games happened at home with my parents playing go-fish or matching flashcards. Then I grew up and went onto college to experience the life of Kahoot, Jeopardy in class to study, and other fun ways to keep us engaged in class content. With the popularity of online learning and the current pattern of education, I foresee gamification taking over the online education world as students start to experience–or keep experiencing things like "zoom burnout."

Imran, H. (2019). Evaluation of awarding badges on sStudent's engagement in gamified e-learning systems. *Smart Learning Environments, 6*(1), 1-12. doi:http://dx.doi.org/10.1186/s40561-019-0093-2

This article explains the history of how gamification entered the e-learning world and how it first became utilized when employers realized there was a lack of engagement and needed an innovative way to get employees interested again and

boost morale overall. The authors explain how over half of the United States had played video games at some point, so there was a need to produce an active learning construct. They found the most successful way to accomplish this in a class setting by using gamification.

The study they focused on was how gamification affects engagement of students to prepare for admissions tests for higher education. The main qualifying factor of gamification in this scenario is reward based learning where students strive to win badges and level up. The course focused on in this study consisted of six components. The first two collected learner data and introduced the main learning purpose. The later four components tested subject-specific skills with a collection of five tests for each. The tests compared how learners reacted to gamified elements compared to traditional, non-gamified learning. According to Imran (2019), “Results suggest that the learner’s engagement was increasing by the badges earned; therefore, gamification processes can be inferred as a strategy to encourage learners and harvest their motivation.” (p. 7) They concluded that assessment combined with interactive feedback is one of the best ways to assess the effectiveness of gamification in e-learning.

I chose this article because of our class conversation on gamification and the gamification resources I found for different K-12 learning skills that are open for students to access and utilize for studying. This article focused on college-prep, and as someone who works in higher education and that age range of students on a daily basis, I was interested to know what the best ways of capturing and holding engagement for this set of students.

Jayalath, J., & Esichaikul, V. (2020;2022;). Gamification to enhance motivation and

engagement in blended eLearning for technical and vocational education and training. *Technology, Knowledge and Learning*, 27(1), 91-118. https://doi.org/10.1007/s10758-020-09466-2

The authors of this article focus on using motivational strategies such as attention, relevance, confidence, and satisfaction in e-Learning instruction for Technical and Vocational Education and Training (TVET.) The authors are aware that drop out rates for TVET programs delivered in a virtual or hybrid platform are significantly higher than those programs offered in a physical classroom face to face, they found the root of this being poor instructional design and lack of learner confidence and motivation. The researchers found that there has not been much research done to find if gamification in e-Learning in the TVET context. So they conducted a trial study to see if gamified elements added to the e-Learning portion of blended TVET learning methods would increase self motivation and engagement amongst students. The gamification created encompassed more than one gamification strategy that was measured including problem solving, goal setting, unexpected event, and many others. The study concludes that gamification does enhance motivation characteristics in TVET learners but further research is needed due to the lack of prior research in this area.

I gravitated towards this article because of the title talking about blended e-Learning. The article explains blended education as the combination of traditional face-to-face learning with the addition of computer mediated instruction, this can be within the classroom or done outside of “class time” by the learner’s self. I like that

TVET encompasses more areas than just higher education so it broadens my research a bit to focus on the effectiveness of gamification strategies in e-Learning.

Phelps, S. L. M. J., & Altabbakh, H. (2018). Enhancing exam prep with customized digital flashcards. *Journal of STEM Education : Innovations and Research, 19*(4), 42-45. Retrieved from http://search.proquest.com.esearch.ut.edu/scholarly-journals/enhancing-exam-prep-with-customized-digital/docview/2174205232/se-2?accountid=14762

The authors of this article wanted to research the effect that digital flashcards had on college students, and students who are getting prepared for college who are doing test preparation. The article explains the effectiveness of traditional paper flash cards that are a memorization and self study tool. Past studies have proved that using spaced learning such as studying flashcards over a course of a week before an exam, is more productive and effective than mass learning for a short period right before the exam. The repetition of using flashcards and testing one's brain can sometimes be a quicker way to memorize fast facts, or even elaborate concepts.

One advantage of using flashcards in a digital format is the ability to share with a group, class, or even the general public to help vastly spread knowledge. A 2012 study found that students use flashcards for two main areas of study: to learn vocabulary, and to recognize key concepts. The authors explain that if teachers and students expanded the areas of study that they use flashcards to teach and study, students would benefit and expand knowledge in many other areas as flashcards are a proven way to improve information retention while studying.

The main study that is explained in this article, had sophomore students in an engineering class create their own virtual flashcards to study for an exam using the platform Quizlet. An anonymous survey was sent out to these students to see how effective they thought the process was. The results show over 60% of students found the act of making the flashcards as “helpful,” the majority of students reviewed the digital flashcards three times, and 50% of the class is “somewhat likely” to make digital flashcards again for another class.

This study interested me because I used the quizlet platform a lot to study for exams and tests mainly in high school. I never went through the act of creating my own set of cards on the platform, I always searched the criteria for the subject matter I was studying. Examples include Romeo and Juliet, chemistry terms, vocabulary sets, and different niche subjects that we were tested on. I found that the information was normally out there, I just needed to double check the facts used before I started studying them because Quizlet is an open platform that anyone can create and publish flashcard sets on. The teacher in this study had the same issue as they had to edit the student flashcards before sharing the correct set she had amended with the whole class.

Sailer, M. and Sailer, M. (2021). Gamification of in-class activities in flipped classroom lectures. *Br. J. Educ. Technol.*, 52: 75-90. https://doi.org/10.1111/bjet.12948

The peer reviewed journal article focuses on an experiential study that compares the effect of studying using gamified activities versus non-gamified study methods in a higher educational setting that is taught in a flipped-classroom style. The authors explain the history of flipped classroom learning where students are to dive into their

“homework” prior to class time, so time in the classroom is spent discussing findings and navigating the learned information. The study found that gamified quizzes can boost student’s motivation and create an enjoyable study environment for them to thrive in and challenge themselves to get to the next level.

It was found that gamified quizzes had a positive correlation with student engagement and notification when a leaderboard is displayed showing how the class ranked. It encourages students to try hard and start some friendly competition in the classroom, while working their brains harder than traditional study methods. In conclusion, it was found that gamification can be adapted for a flipped classroom format for learners in higher education.

Subhash, S., & Cudney, E. A. (2018). Gamified learning in higher education: A systematic review of the literature. *Computers in Human Behavior*, 87, 192-206. https://doi.org/10.1016/j.chb.2018.05.028

The authors of this article focus on why gamification has become important in the educational setting. It has been found that game elements in non game-centric contexts have been used to boost motivation and increase participation. The authors conduct a systematic review of literature of peer reviewed english articles from past and previous methodology that talks about how gamification categorizes into different parts of higher education. The review found that the literature could fall into one of three categories: gamified learning, gamification in higher education, and game based learning in higher

education. When I first began reading this article, I said to myself those are all the same, why would there be a need for categories? This is what drew my interest in so I could learn a broader scope of the specifics of gamification and the differences between the terms gamification, and game based, and how it all can be translated to higher education.

The authors composed a detailed list of each scholar, the year their literature was posted, the focus of the study, some key finding take away points, benefits of the findings towards education, and the game elements discussed. I think this list will be very useful for my future projects to discover new gamification theories and compare and contrast scholars' ideas and past projects.

Tegtmeier, T., Neofotistos, S., & Noormohamed, N. A. (2013). How gamification rewards college-aged consumer loyalty: One click at a time. *Competition Forum, 11*(2), 177-184. Retrieved from http://search.proquest.com.esearch.ut.edu/scholarly-journals/how-gamification-rewards-college-aged-consumer/docview/1756026730/se-2?accountid=14762

The authors of this article wanted to find out what drives college-aged people to purchase a product. It has been shown through the popularity of sharing trends and filters on social media, that marketing to a younger age group might best be done through their cell phone, better yet by adding a gamified element to the marketing where people can compete and share with their social media friends and followers.

The article concludes by expressing how important brand ambassadors are to a college campus for products that should be marketed to that specific age group or

demographic. Looking back on my years in undergraduate, I can think of a number of friends and classmates who were brand reps and always giving away little trinkets or inviting me to smaller events. I have seen companies such as Bumble, Victoria Secret's PINK, Herbalife, Monet Hair Care, fitness brands, and so many more use brand reps to get other like minded people excited to try, use, and then market their products. I have even signed up to be a brand rep in the past because who doesn't love free stuff.

I chose this article because I have been focusing on gamification in higher education, but I came across this and was intrigued to discover what motivates college aged students to become so invested in trends such as gamification. I think this article provides a good basis and background to back up my research as a whole on the connections and success with using gamification in higher education.