Gamifying College Academic Writing Class – A Case Study

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Gamification refers to the application of game mechanics to non-game settings in order to promote motivation and increase engagement (Brian, 2014; Li, Dong, Untch, & Chasteen, 2013). Many tools have been introduced to gamify learning in all kinds of educational settings. Among these tools, digital badges are considered as an achievement-based gamification tool (Grouling, Hedge, Schweiger, & Cinder, 2014) which have been gradually adopted in higher education for about 10 years (Abramovich, 2016; Grouling, et al., 2014). Although some researchers claimed using digital badges does not involve real game thinking, which includes competition, cooperation, exploration and storytelling (Kapp, 2012), most educators agree that gamification can involve using leaderboards, point rewards, achievements, and badges (Grouling, et al., 2014).

In educational settings, digital badges are used to deliver instruction and track learning outcomes and learning progress (Rimland, & Raish, 2019). Researchers pointed out digital badges can support self-regulation (Cucchiara, Giglio, Persico, & Raffaghelli, 2014) and increase self-awareness (Abramovich, 2016). Cheng, Waterson, and Newby (2018) stated that digital badges can help with goal setting in learning process. Other researchers claimed the implementation and use of digital badges not only motivates learners but also provides a new method for assessment and creates alternative credentials (Newby, Wright, Besser, & Beese, 2016).

Although the existing literature has discussed the advantages of using digital badges as a gamification tool, research on the effectiveness of using digital badges in higher education are still limited. Therefore, researchers have called for future studies on how to use digital badges and what instructional strategies should be used (Abramovich, 2016; Cheng, Waterson, & Newby, 2018). Other researchers called for investigations on using gamification tools in different contexts (Abramovich, 2016), such as in writing classes (Grouling, et al, 2014). In respond to these calls, this case study chose two digital badge tools to gamify a college level writing class at a Midwestern university. Through surveys and interviews, the study will investigate the effectiveness of gamification, student perception of gamification, and the impact of gamification on student learning behavior in the writing class.

Background and Purpose of the Study

The issues and problems of college writing class has been discussed throughout the last two decades. Poor preparation from high school is one of the biggest issues of college writing class, especially in first year class (Hughes, 2009). Some educators claimed students are less

engaged in writing class than other subjects that directly related to their majors (Tantawi, Sadaf, & Alhumaid, 2018). Therefore, correcting negative behaviors and increasing engagement and collaboration should be considered in today's college writing class (Grouling, et al, 2014). On the other hand, traditional lectures and PowerPiont slides are not enough for today's writing class (Coffin, Curry, Goodman, & Hewings, 2003; Grouling, et al, 2014), and new strategies and tools need to be adopted in teaching academic writing to accommodate millennial students (Coffin, et al, 2003). Other researchers addressed using technology in academic writing classes has multiple advantages, such as improving students' responsibility for their own work (Levine, Ferenz, & Reves, 1999) and encouraging peer responses (Jin, 2007).

Among these technologies, gamifications and digital badges gained increasing attention. Grouling, et al (2014) reported using digital badges in a college writing class improved perceived enjoyment of collaboration and student self-reported attendance. Similar results were reported form multiple subject areas in other universities/institutions (Abramovich, 2016; Rimland, & Raish, 2019). Some universities even developed their own digital badge platforms to embrace gamification in teaching and learning, such as University of Central Florida (Cheng, et al, 2018), UC Davis, and Purdue University (Newby, et al., 2016). Purdue University reported more than 10,000 students has been using Purdue self-designed digital badge tools, and these tools become one of the most commonly used educational tools on campus. To improve the effectiveness of college writing class and explore potential gamification ways using digital badges, this case study investigated student perceptions, learning behavior, and the effectiveness of these gamification tools in a college-level academic writing class.

Research Design

An undergraduate-level first-year composition class at a Midwestern university was chosen for this case study. The course was delivered face-to-face in the spring semester of 2019. The academic writing course emphasizes writing as a process, and writing projects assigned to students throughout the semester traditionally consist of five papers, each with multiple drafts, and only the final drafts are graded. Following this assessment and instructional approach, and in line with the literature, the instructor realized the challenge in engaging students in writing drafts for each assignment and in class collaboration. In order to improve teaching, the instructor incorporated two university self-designed digital badge tools to gamify the course.

Specifically, one of the tools was used to demonstrate students' competencies and record their achievements with badges. A total of 18 badges were linked to the five assignments and the corresponding drafts. Students received a badge once they submitted one part of the assignment on time and met all the requirements. Students who received all of the 18 badges were awarded extra 20 points on their final course grade. In addition, students can choose to show the earned badges to their peers or make it private.

The other tool was used to deliver gamified online quizzes in class to improve collaboration. To take the quizzes, the class was divided into multiple groups. Each group were asked to access to this tool and choose an avatar before taking the quiz. The whole group received a badge once they completed a quiz. The instructor showed the quiz results leaderboard on the big screen. The top 5 scored groups' avatar were displayed on the leaderboard. A total of 3 online quizzes were designed for this class.

The class contained 19 students aged from 18 to 20. All of the participants were trained to use these tools at the beginning of the semester. Technology support was provided when the course was delivered.

Research Questions

This case study will be conceptualized to answer the following two questions:
1. How do students perceive the effectiveness of gamification tools in the writing class?
2. Do gamification tools improve collaboration between students?
3. Is there any relationship between student perception of gamification and their academic performances?

Data Collection and Analysis

This study collected two types of data. One is the number of badges and the course final grades that each of the participants earned, which is collected by the instructor. The other type of data comes from the online survey and face-to-face interviews, collected by the first author.

Before the end of the semester, the participants were invited to take an online survey that evaluated student perceptions of the two gamifications tools respectively. The survey included two sets of 5-point Likert scale with 13 statements. As a cross-check, they were also invited to participate in an interview which included 10 questions about the overall perceptions of gamification tools and the learning strategies that were used in the class. To gain better insight into the effectiveness of the gamification tools in instruction, we also interviewed the instructor at the end of the semester.

Research Question 1

A total of 18 students took the online survey. The responses of the statements were summed up to get the overall perceptions of the two gamifications tools. The points that each statement received ranged from 1 to 5. The average points that each statement received ranged from 2.58 to 3.5. Table 1 shows the descriptive statistics of the survey results.

Table 1

Descriptive Statistics of Online Survey

Statements	Min	Max	Mean	Median	Mode
Q1.1 Earning badges makes me enjoy academic writing.	1	5	2.58	2	2
Q1.2 Earning badges makes academic writing easier.	1	4	2.58	2.5	4
Q1.3 Earning badges helps me complete my assignment on time.	1	5	3.33	4	4
Q1.4 Earning badges helps me understand assignment requirements.	1	5	3.33	4	4
Q1.5 Earning badges helps me to value writing as a process.	1	5	2.75	3	1
Q1.6 Earning badges ensure efficiency of peer editing.	1	4	2.41	2.5	1
Q1.7 The digital badge tool is easy to use.	1	5	3.5	4	4
Q1.8 I enjoy using the digital badge tool.	1	5	2.75	3	3

Q2.1 Taking quizzes using the gamified online quizzing tool is fun	1	4	3	3.5	4
Q2.2 Taking quizzes facilitates in my learning of academic writing concepts	1	4	3.17	3.5	4
Q2.3 Taking quizzes using the gamified online quizzing tool improves my class participation	1	5	3.33	4	4
Q2.4 The gamified online quizzing tool is easy to use.	1	5	3.25	4	4
Q2.5 I enjoy using the gamified online quizzing tool.	1	5	3.25	3	3

The top ranked statements for the digital badge tool are: "earning badges helps me complete my assignment on time", "earning badges helps me understand assignment requirements", and "the digital badge tool is easy to use". The top ranked statements for the gamified online quizzing tool are: "taking quizzes using this tool improves my class participation", "the gamified online quizzing tool is easy to use", and "I enjoy using the gamified online quizzing tool". The following screenshot image shows the badges on the instructor's dashboard. Student dashboard only shows the badges they earned.
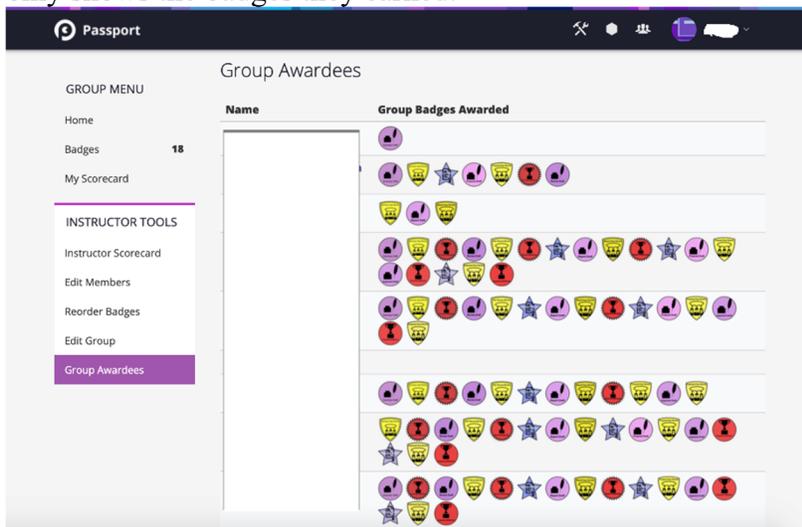

Figure 1. Instructor Digital Badges Dashboard
(Note: students' names are deleted from the image)

The interviews focused on the students' specific experience of gamification tools. A total of 12 students participated the interview. Overall, the students gave positive feedbacks on the gamification tools and the class activities that were designed with the tools. Students claimed digital badges helped them track their work and remind them to finish the assignments on time. Such comments include: "the digital badge tool is a checklist for me. It's very helpful to remind me submit my assignments on time", "The digital badge tool keep me more organized. The listed due dates make it easier", "Digital badge is helpful because it monitored my progress", and "This tool helps me track what I did and reminded me to finish the assignments".

When asked about their opinions on the activities that are designed using the online quizzing tool, more than half of the participants mentioned using the gamified tool is a fun way to take quizzes. One students mentioned "we only used this tool three times in the class. I wish

we used it more." When asked if they would like to use these two tools again in the future, all of the interviewees said yes except for one who commented "not sure". Most students are expecting to use these tools in other classes as well.

On the other hand, some students offered negative feedback on these tools. One said the tools were very confusing and hard to use. The other one thought the tools didn't help with his/her study at all. One students claimed that submitting assignments through a digital badge tool creates confusions because other courses use learning management system to collect assignment.

Research Question 2

Research question 2 is specific to the online quizzing tool. The whole class was divided into several groups to take the online quiz in class. The top 5 groups showed up on the leaderboard of the tool. At the end of the quiz, the instructor showed the leaderboard on the big screen in class. Both of the survey responses and the interviews results were used to answer this question.

As aforementioned, in the Likert scale, the statement "Taking quizzes using the gamified quizzing tool improves my class participation" is among the highest ranked statement. Based on the interview, more than half of the participants mentioned that the tool made group work interesting. One student mentioned "using this tool get everyone involved in the team work". The other students claimed "I communicated more with other members when using this tool". Some students claimed that group work was helpful and this tools should be use more often. An interesting finding from the interview is that almost 1/3 of the students claimed they would like to use this tool individually rather than using it for group work
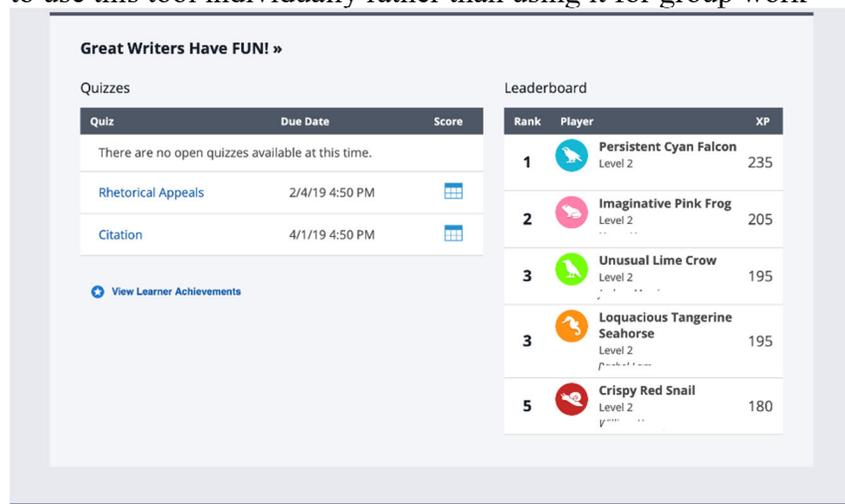

Figure 2 Quiz 2 leaderboard.

Research Question 3

To answer research question 3, students' final grades and the online survey results are analyzed. For the final grades, the total points that students received ranged from 589 to 1000. About 88% of the participants received more than 80% in final grades. One students received 60%, and one student received 58%.

Correlation test didn't show linear relationships between students overall perception of gamification tools and their final grades, which is likely because of the small sample size. Another possible explanation is that the final grades also included students' attendance and presentations, so they did not perfectly represent students' writing performances.

We found 5 out of 18 students received all the 18 badges and were awarded 20 points to add on their final grades. Based on the survey results, these 5 students gave very positive comments on the tool. One of the students stated: "I like to use the digital badge tool. It keeps me from been lazy. I'm motivated to do the quality work instead of getting extra credit." The other students claimed "I like the idea to earn each badges when I work on the essay. Helped me catch up. I like the gamified online quizzes. It was good to test knowledge. Taking the quiz in group is also helpful".

An interesting finding is that the three students gave lowest ratings on the online survey statements actually received 88-90% in final grades. Two of them did not attend the interview. The student attended the interview gave almost opposite feedback on the effectiveness of the gamification tools that were used in class. The student mentioned "the digital badge tool helps the teacher organize the materials and it motivated me in a better way." The students also claimed "using the digital badge tool is better than nothing. It make the class easier."

Findings and Discussions

This case study looked into the impact of gamification tools in a college level writing class for the purpose of finding an innovative way to improve this class. Student perceptions, achievement, and learning behavior were analyzed. Our findings can be concluded into the following five aspects:

First, overall, 67% participants agreed that earning badges helped them understand assignment requirements and complete assignment on time. About 60% students agreed that the gamified quizzes improved their class participation and facilitated learning. However, the survey results also shows students perceptions on the gamification tools were highly varied. The rating range for each of the survey statement is from 1 to 5. Based on the interview, this is likely because students had different technology experience.

Second, the perceptions and effectiveness of the gamification tools are impacted by the teaching strategies that are designed by the instructor. Table 1 shows students have more positive perceptions on the gamified online quizzing tool over the digital badge tool. This is likely because the quizzing tool not only provided digital badges and leaderboard, but also because it was used in group works. Class discussions and collaborations were greatly improved by using this tool.

Third, student learning behavior impacted their opinion on using the gamification tools. More than half of the participants claimed they enjoyed the group work. They also addressed the gamified online quizzing tool made the group work fun. The instructor observed increased class discussions and collaborations. This verified the previous studies on improving class collaboration (Grouling, et al, 2014). On the other hand, a few students claimed they would like to use the tool individually instead of in groups because they prefer to work by themselves. In regard of this issue, we suggest future study focus on engaging students with different learning behaviors.

Fourth, from the instructor's perspective, using digital badges motivated the instructor to redesign the course in a better way. The instructor of this class pointed out that using the gamification tools helped her rethink the course structure, update the instructions for each of the assignment, revise assessment plan, create class activities, and create new rubrics to help students understand the requirements of the assignments. The instructor also claimed using the

gamified online quiz tool created fun times in class and greatly helped her engage students in class.

Last, using gamification tools and learning management system at the same time could cause confusing. Although students were trained to use the tools at the beginning of the course, they were expecting a simpler way to earn the badges and take the gamified online quizzes. For the instructor, tracking students' achievement across systems took a longer time than focusing on one system. For this reason, we call on future studies in bridging the LMS and the gamification tools, especially for fully online classes.

References:

Abramovich, S. (2016). Understanding digital badges in higher education through assessment. *On the Horizon. 24*(1). 126-131.

Brian, A. (2014). Gamification in Education. Proceedings of ASBBS. 21(1). ASBBS Annual Conference: Las Vegas.

Cheng, Z., Watson, S. L., & Newby, T. J. (2018). Goal setting and open digital badges in higher education. *TechTrends. 2018*(6)2. 190-196.

Cucchiarra, S., Giglio, A., Persico, D., & Raffagheli, J. E. (2014). Supporting self-regulated learning through digital badges: A case study. In Y. Cao et al. (Eds.), *ICWL Workshops*, 133–142.

Hughes, S. (2009). A Mixed Method Study on Freshman Students' Writing Performance as Addressed by Postsecondary Professors. Dissertation. University of South Carolina.

Jin, L. (2007). Computer-mediated peer response in a level-IV ESL academic writing class: A cultural historical activity theoretical perspective. Dissertation. University of South Florida.

Kapp, K. (2012). *The Gamification of Learning and Instruction: Game-based Methods and Strategies for Training and Education*. San Francisco: Pfeiffer.

Levine, A., Ferenz, O., Reves, T. (1999). A computer-mediated curriculum in the EFL academic writing class. European Association for Computer Assisted Language Learning. 72-79.

Li, C., Dong, Z., Untch, R. H., & Chasteen, M. (2013). Engaging Computer Science Students through gamification in an online social Network based collaborative learning environment. *International Journal of Information and Education Technology. 3*(1).

Newby, T., Wright, C., Besser, E., & Beese, E. (2016). Passport to designing, developing and issuing digital instructional badges. In d. Ifenthaler, N. Bellin-Mularski, & D. Mah (eds.), *Foundation of Digital Badges and Micro-Credentials* (pp.179-201). Springer International Publishing.

Grouling, J., Hedge, S., Schweigert, A., & Snider, E. G. (2014). Questing through class: gamification in the professional writing classroom. in deWinter, J., & Moeller, R. M. (2014). *Computer Games and Technical Communication: Critical Methods and applications at the Intersection*. Routledge.

Rimland, E., & Raish, V. Digital badges: How schools and libraries use them today. *American Libraries. 50*(3). 49.