

101up: Implementation of a Gamified Curriculum to Increase Self-Regulated Learning Skills and Motivation for At-Risk Students in a First-Year Experience Course: An Action Research Study

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Index words: EdApp, gamification curriculum

Abstract

The transition to college from high school is significant for at-risk students, especially as they tend to struggle with self-regulated learning skills when trying to adapt to the university environment. In an attempt to mitigate this challenge and assist students with this transition, many universities offer first-year experience courses. The purpose of this action-based research study was to evaluate the implementation of a gamified curriculum (EdApp) for at-risk students enrolled in a university first-year experience course. This seven-week action research study incorporated a gamified curriculum designed to increase self-regulatory learning skills (goal setting, strategic planning, task strategies, self-instruction help-seeking, and metacognitive monitoring) and motivation (choice, control, collaboration, challenge, constructing meaning, and consequences) for 10 academically at-risk students enrolled in a first-year experience course. Qualitative and quantitative data was collected from the Learning and Study Strategy Inventory (LASSI) instrument, journal reflection assignments, a Final Self-Reflection Learning Quest, gamification elements, and learning management system (LMS) metrics. Findings from this study indicated that although only one subscale of the LASSI, Self Testing, was found to be statistically significant, correlations were found between various gamification elements and the subscales of Information Processing, Concentration, and Using Academic Resources. Additionally, as a result of various cycles of coding and the emergence of themes, findings suggested that students perceived the gamified curriculum as helping to improve their academic mindset, study habits, and motivation, all while making their learning easier. Implications for instructors considering the implementation of a gamified curriculum and future areas of research are offered.

Keywords: EdApp, gamification curriculum, at risk students, first-year experience course, motivation, self-regulatory learning skills

The transition from high school to college is hard for the majority of students, but it is even more so for at-risk freshmen who tend to struggle with self-management skills and lower self-regulated learning skills when trying to adapt to the university environment (Sun et al., 2017; Tang & Wong, 2015; Vallerand & Blssonnette, 1992). The odds are stacked against them; over 40% of college students do not complete their degree in six years ("IES", 2018), with 33% dropping out entirely (Shapiro et al., 2017). The freshman year is especially critical, with 28% of students dropping out before their sophomore year (Shapiro et al., 2017). In order to help mitigate these odds, many universities have developed first-year experience (FYE) courses to ease students' transition to college life (Connolly et al., 2016). Ideally, the FYE course helps new students adjust to the university by developing a better understanding of the learning process to acquire essential academic success. Students learn to adapt and apply appropriate academic strategies to their classes and learning experiences, effectively managing their time and priorities (Young, 2019). The research of Dembo and Seli (2016) supports that self-regulated learning skills can be a predictor of academic success. When self-regulated learners are engaged – they adapt their thoughts, their feelings, and their actions to impact their learning and academic success. Additionally, both motivational and cognitive interventions are needed to effectively increase self-regulated learning (Pintrich, 2004; Zimmerman, 2013).

A gamified curriculum has the potential to be effective in a FYE course to address the issues of at-risk student motivation and self-regulated learning. Specifically, the use of game-based thinking, mechanics, aesthetics, and motivational design strategies has been successfully incorporated into curriculum design in order to promote learning (Fazamin et al., 2015; Kapp, 2012; Kim & Lee, 2015; Su & Cheng, 2015). One reason for this is that gamification has the potential to externally motivate students (Kumar & Khurana, 2012; Nah et al., 2014, Su & Cheng, 2015) which is key to its effectiveness (Burke, 2014; Sailer et al., 2017). The feedback associated with gamification can also empower students as self-regulated learners (Nicol & MacFarlane-Dick, 2006). Feedback strategies in gamification, such as rewards and incentives, can be effective at helping students set goals and reflect on successful learning methods (Dichev et al., 2018). Therefore, gamification may be a novel way to address both self-regulated learning and motivation for at-risk freshmen as part of a FYE course. With the promise of improved self-regulated learning and motivation, a gamified FYE course could very well be a suitable launching point for a student's successful academic career.

Purpose Statement

The purpose of this action research study was to evaluate the implementation of a gamified curriculum for at-risk students enrolled in a FYE course at a 4-year university. The first research question in this study explored how, and in what ways, the implementation of a gamified curriculum impacted the self-regulated learning skills of at-risk students. The second question explored how the implementation of a gamified curriculum impacted the motivation of at-risk students. And the third question examined the perceptions that at-risk students might have about the gamified curriculum on the quality of their learning experience.

Theoretical Framework

There were three theoretical frameworks that underpinned use of a gamified curriculum for this study. First, consistent with behavioral approaches which embody Skinner's theory of operant conditioning (Skinner, 1938), reinforcement schedules are used within a gamified curriculum by providing rewards, badges, and points at varying intervals order to maintain learners' interest (Kapp, 2012) by providing positive

reinforcement (Woolfolk, 1998). Second, Ryan and Deci's (2000) Self-Determination Theory suggests that learners become more self-determined and motivated when three basic needs are met: Autonomy, Competence, and Relatedness. When assessed in this regard, gamification has been found to increase motivation by emphasizing positive learning habits, or fostering task-meaningfulness through chunked goals as well as immediate and positive feedback (Harrold, 2015; Sailer et al., 2017). Third, Turner and Paris's (1995) Six C's of Motivation theory was used as it emphasizes Choice, Control, Collaboration, Challenge, Constructing Meaning, and Consequences, all of which are inherent in effective gamification practices.

Methodology

Participants and Setting

The setting of this study was a FYE course at a regional campus in the South Eastern U.S. with an enrollment of about 2,000 students. The 16-week FYE section taught in Spring 2020 had 17 students. There were two inclusion criteria for the study—one was that the student had attended the university for at least one semester and that their GPA was less than 2.99, which is the institutional average. The other criterion was based on how, according to the provost, the university unofficially defines at-risk—students also could have failed a course to be eligible. After applying these criteria, 12 students were eligible to participate. Secondary to COVID-19 restrictions forcing the campus to shut down, two of the students did not login or finish the course. Thus, the purposeful sample population size of my study that met the inclusion criteria when data was being collected was 10 students. Sixty-percent of the participants were male and forty-percent were female.

Initially, the course met twice a week, in-person, for 75 minutes. The course was held in a classroom enabling each student access to a desktop computer where they could access the course content and all associated activities on the Blackboard Learn learning management system (LMS) during class meeting periods. After week 6, the COVID pandemic restrictions forced learning to be in the fully online environment.

Research Design

An action research approach supported trying out a novel gamified curriculum to help solve the problem of FYE students lacking self-regulated learning skills. Adjustments could be made through spiral of continuity, of implementing, evaluating, and revising the curriculum (Dick, 2002; Mertler, 2017). Use of a mixed-method design, with convergent strategies, offered the rigor of quantitative data analysis, coupled with the understanding gleaned from the qualitative data analysis. Triangulation was employed to ensure the findings were consistent regardless of the data collected or method utilized.

Innovation

The gamified curriculum was intentionally designed to help students acquire self-regulated learning skills through goal setting, strategic planning, task-strategies, meta-cognitive monitoring, help-seeking, and self-instruction. It was also designed to increase motivation, based on Turner and Paris' (1995) 6C's of motivation (see Table 1).

The gamification elements designed in Blackboard consisted of worlds, quests, badges, currency, and a progress board. During week 4 of the semester, it became apparent students were not engaged in gamification as part of the Blackboard LMS as

Table 1

Self-Regulated Learning and Motivation Elements Aligned to Gamification Strategies Using EdApp

Self-Regulated Learning Elements	Motivation Elements	Gamification Elements and Strategies
<ul style="list-style-type: none"> • Goal Setting 	Choice	<ul style="list-style-type: none"> • Quests • Leveling-Up • XP • Currency (stars) • Achievements/Badges • Leaderboard
<ul style="list-style-type: none"> • Strategic Planning • Task Strategies • Self-Instruction 	Control	<ul style="list-style-type: none"> • Gameplay • Quests • Leveling-Up • XP • Currency (stars) • Leaderboard
<ul style="list-style-type: none"> • Help-Seeking 	Collaboration	<ul style="list-style-type: none"> • EdApp Customer Support Function • Group quests were not possible after everyone left campus due to COVID-19
<ul style="list-style-type: none"> • Meta-Cognitive Monitoring 	Constructing meaning	<ul style="list-style-type: none"> • Quests • Leveling-Up • Achievements/Badges • XP • Currency (stars) • Leaderboard
<ul style="list-style-type: none"> • Goal Setting • Strategic Planning • Task-Strategies 	Consequences	<ul style="list-style-type: none"> • Achievements/Badges • Leaderboard • XP • Leveling-Up • Currency (stars)
<ul style="list-style-type: none"> • Goal Setting • Strategic Planning • Task Strategies 	Challenge	<ul style="list-style-type: none"> • Objectives • Quests • Leveling-Up • Achievements/Badges • Leaderboard • XP • Currency (stars)

evidenced by their expressed apathy and dissatisfaction, lack of checking their achievements, and paucity of enthusiasm during class discussions. Seeking a solution, some computer science students conducted a focus group with the FYE students to see what they desired in a gamification platform. The results indicated the majority of students preferred competitive games, convenient social media apps, and a strong desire for a visually attractive app. The majority said points would serve as a motivating factor and that they would like a leaderboard highlighting those students in the top running. As well, they would find extra-credit opportunities worthwhile to them. The recommendation offered was EdApp, a mobile LMS app with gamification capabilities of holding all the course content, and students could access the platform on their phones like any other app. Over the next couple of weeks when school was postponed for Spring Break and the COVID-19 transitioned to fully online course delivery, all of the class content (quests) were created in EdApp. This resulted in a seven-week innovation implementation. Fortunately, due to the ease of the platform, very little explanation was needed and students dove right in.

When students clicked on a quest, they experienced a journey with an opening objective followed by a mix of multiple-choice, free-response, Likert-Scale and true/false questions, words of encouragement, as well as various games. Slides were not static and there was always an element of interaction, whether it be pressing a button, swiping, dragging and dropping in a word, scrolling to select a number, circling the correct answer, drawing a line to associated items, expanding a bulleted list, or flipping a card for more detail, etc. Supplementary visuals and videos were also included so information could be expanded upon, or examined in more detail by students. Each main lesson quest concluded with a Jeopardy-style game in which students could win experience points (XP) and stars. Ending quest slides either offered encouragement, reminded students of the star bar opportunity, or an extra-credit mini-quest of the same name comprised of game opportunities. At the end of each extra-credit quest, students were encouraged to go to the star bar to spend their stars for a chance to win an Amazon gift certificate. In addition to the quests in EdApp, students were able to access the class leaderboard (populated by achievement points earned for each quest activity), the star bar (students earned star currency when answering reinforcement questions or engaging with the game slides in EdApp), their performance metrics (stars earned, lesson completion status, and badges earned), and the Brain Boost quiz function via the side menu in the app. See Figures 1 through Figures 4 for the design of EdApp used for this study.

Figure 1
Structure in Ed App

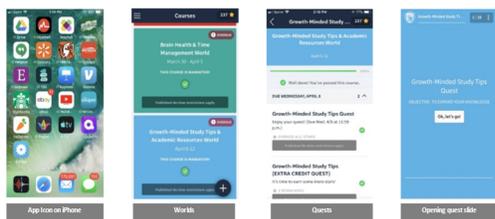


Figure 2
Answering Options

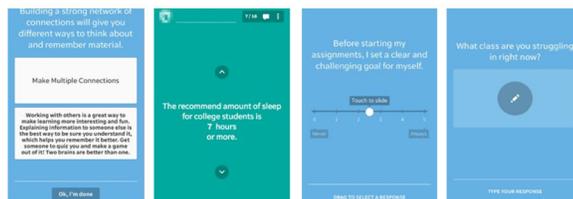


Figure 3
Badging Opportunities

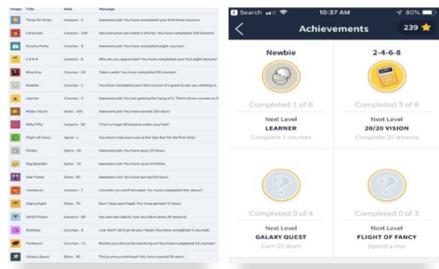
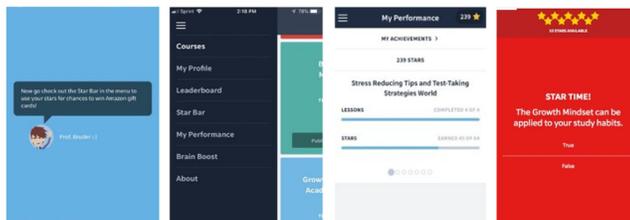


Figure 4
Game Currency: Star Bar



Data Collection

There were four data collection sources in this study: 1. Gamification Element Metrics; 2. Final Self-Reflection Learning Quest—which was comprised of free-response, multiple choice, and Likert-scale questions; 3. Reflection Journal Assignments, which consisted of two to three free response prompts; and 4. the Learning and Study Strategy Inventory (LASSI, Weinstein et al., 1987) which was administered to students at the beginning and end of the course. This survey measured the ten subscales of Anxiety, Attitude, Time Management, Test Strategies, Self Testing, Using Academic Resources, Concentration, Information Processing, Motivation, and Selecting Main Ideas. Each subscale was measured by the extent to which students agreed or disagreed, using a Likert-scale, with each of six reflection statements. To ensure rigor and trustworthiness, triangulation, member checking, thick, rich descriptions, peer debriefing, and an audit trail was conducted.

Results

Between the various LASSI subscale scores, the multiple-choice and Likert-scale questions used in the Final Self-Reflection Learning Quest, as well as the numbers of gamification elements and metrics, this study yielded sizeable quantitative data. The LASSI pre and posttest scores were analyzed using paired t-tests. The Bonferroni adjustment was used to help guard against the possibility of false positive findings since there were multiple measures to address a single research question. The findings revealed two subscales decreased, one remained the same, and seven increased—with only three of those being significant. After applying the Bonferroni adjustment, only the Self-Testing subscale showed statistical significance ($p < .001$) meaning participants' self-regulation regarding learning and study strategy skills improved after experiencing the gamified curriculum innovation. Descriptive and frequency statistics were used on the numbers of gamification elements. Without any context, it was difficult to ascertain whether or not these elements had intrinsic value. Therefore, a series of correlation analyses was performed, with Pearson's r as the correlation coefficient, in order to identify statistically significant relationships between the LASSI subscale scores and the gamification element scale values. The findings indicated that the Information Processing posttest score strongly correlated with experience points (or "XP", $r = .90, p < .001$), as well as other measured variables, such as the number of stars earned (where in the context of EdApp, "stars" are a form of "currency", $r = .89, p < .001$). Information Processing also strongly correlated with the chance of winning a gift card motivating the student to do better in class ($r = .85, p < .01$). The gift card ranged from \$5 to \$20 during the course increasing the student's desire to win one ($r = .82, p = .002$). The

Concentration posttest score strongly correlated with badges earned ($r=.81, p<.01$), and Using Academic Resources strongly correlated with the number of stars earned ($r=.80, p<.01$).

For the qualitative data, the process of inductive analysis began with initial rounds of coding that included Structural, InVivo, Process, and Descriptive coding (Saldaña, 2016). During the second cycle of coding, Pattern coding resulted in the emergence of 10 categories and subsequently, three themes. The first theme was students perceived their academic mindset and study habits to have improved which denotes an improvement in study skills as well as growth in terms of one's academic mindset. It is distinguishable from the other two themes in that it was tied to students taking the academic skills they have learned and applying them to their other classes. The second theme, the gamified curriculum served to motivate students was distinguishable from the other two themes, in that it involved more "will" to learn, as opposed to skill and ease of learning. The third theme, students perceived the gamified curriculum made their learning easier effectively addressed the impact that the content's delivery vessel had on students' experience.

Although the LASSI Motivation subscale was not found to be statistically significant ($p=.08$), it should be noted that the LASSI measured motivation across the board as it pertained to the students' total academic experience, which included other classes. It does not mean the gamified environment did not improve motivation in this class specifically, as evidenced by the many positive qualitative responses that the students provided (i.e., "The class has motivated me to become less lazy and get things done.", "This class motivated myself to manage my time when coming to studying for a test and having to finish something with getting enough time to sleep for class the next day", "I enjoy it. I like to compete and the games engaged me more in the classroom."). Virtual currency was also a big motivator for some students, especially those who participated in a chance to win a gift card in the star bar ($M=4.5/6.0, SD = 0.90$). As shared by one student, "The stars motivated me to finish my quests. The stars were my biggest motivation because I wanted to play in the star bar." Also, because the students found relevance in the content, they were more motivated to use what they learned outside of class. Three students expressed this in their final self-reflection learning quest responses, "When we went over the studying unit and how much you really should study, I applied that studying to my macroeconomics exam.", "This class helps you with your other classes and you can apply your knowledge.", and "I bettered my study habits in my history class."

Overall, the students perceived the experience on EdApp to be quite appealing—it was very well received, especially in terms of its clean, organized structure free of distractions, its perceived stress-free environment, its ease of use, and the opportunity to have all content right at one's fingertips on a mobile device. As stated by a couple students' final self-reflection learning quest responses, "This app sort of felt like a break and I enjoyed learning the information. My other classes are like stress and work. This was more of a weight off of my chest.", "I like the layout of the app, everything is well organized.", and "You can use it on the go with your phone and it was convenient if I was someplace else."

Discussion

It is essential to look at findings within current research regarding gamification in an educational context. To address the research questions, data were merged and analyzed through a mindset of self-regulated learning, motivation, and perceptions about gamified curricula.

The first research question this study explored was how, and in what ways, the implementation of a gamified curriculum impacted the self-regulated learning skills of at-risk students. The gamified elements of the course, as delivered through the EdApp

platform, gave students an enjoyable venue in which to improve upon their own self-regulated learning as part of the course. This was not surprising, as when college students are given autonomy in gamified environments, they tend to have stronger self-regulated learning skills than students in traditional, controlled settings (Lambert, 2017). What made this gamified experience unique was that the students were actually learning how to improve their study habits through the curriculum content in addition to engaging with the gamified elements, thus providing them with a double dose of opportunity to improve in the area of self-regulated learning. As shared by one student, “The test-taking and study strategies were the most useful for me because test-taking and studying is usually what I have the most difficulty in.” The opportunity for personal reflection allowed students to apply what they learned to their own lives and find meaning, showing how a gamification platform could be considered an ideal way to teach self-regulated learning skills such as goal setting and persistence through a growth mindset, especially as games exemplify these characteristics (Devedzic & Jovanovic, 2015; Educause, 2014; Gibson et al., 2015; Sailer et al., 2013; Tang & Kay, 2014). This was supported by a student’s comment, “the course really helped me self-evaluate and better prepare myself for the future. I have not had a course that was so about myself and the critique and critical thinking of one’s self-evaluation on schoolwork and everyday things.” Students who are engaged and actively generating meaning while adapting their thoughts, feelings, and actions as necessary to affect their learning and motivation are considered to be self-regulated learners (Boekaerts & Corno, 2005). This can be accomplished with both video and written responses within the gamification platform as a form of metacognitive scaffolding to improve self-regulated learning (Tang & Wong, 2015).

The second research question explored how the implementation of a gamified curriculum could impact the motivation of at-risk students. Gamification has been found in the existing literature to yield increased motivational results (Harrold, 2015; Ling, 2018; Pilkington, 2018; Sailer et al., 2017). Quantitatively, this was not the case for the students in this study as the LASSI Motivation subscale did not indicate a statistically significant increase in score. However, qualitatively students did offer comments in their Final Self-Reflection Learning Quest about experiencing an increased sense of motivation through the use of the gamification curriculum. As evidenced by student responses on the final self-reflection learning quest, “After the class I’ve been really been motivated to do all of my assignments”, or “pushed you to better yourself because everyone can better themselves.” The integration of virtual currency through the form of being awarded stars in the EdApp curriculum was identified by students to be a source of motivation. As shared by one student, “The Amazon gift card thing was usually a challenge. I would end up spending all of my stars while trying to win.” Additionally, the amount of engagement in earning badges, stars, and XP, which in turn resulted in students’ completion of extra credit quests, are attributes directly associated with motivation (Yot-Domínguez & Marcelo, 2017).

Motivation through the use of a gamification curriculum can also be seen through feelings of competence and relatedness (Sailer et al., 2017). In order for competence to be experienced by the learner, gamified activities should pose optimal challenges to the student (Kam & Umar, 2018). Challenges in gamified curriculums can predict student learning while increasing engagement (Hamari et al., 2016). In this study, students voiced their pleasure in terms of the challenges they conquered in the course; which supported the notion that the motivational appeal of games may be their ability to provide players with challenges

to master, thereby enabling feelings of greater competence (Mekler et al., 2017). Meeting students' needs for relatedness can be fostered by creating shared goals (Sailer et al., 2017) and achievements (Sillaots, 2015). In this study, a collaboration did not result from peers in class working together but rather from the students' collaboration having reached out to other students in the university tutoring center for help. As found in one student's reflection journal assignment response, "I was not suffering in silence anymore as I started going to the tutoring center." In support of this particular student's response, her score on the LASSI Using Academic Resources subscale showed an increase of 150% from the pretest to the posttest.

The third research question examined the perceptions that at-risk students might have about the gamified curriculum on the quality of their learning experience. Overall, this study's students' perceptions of their experience with the gamified curriculum using EdApp were very positive, and everyone shared that they liked the design of EdApp. In fact, they wanted more gamification, as found in a couple open-ended final self-reflection learning quest responses, "the whole course should be on the EdApp with the games", "use EdApp and make the whole class online.", "I wished we would have switched to EdApp sooner", and "it [EdApp] should keep going for years to come and be implemented in education as a whole." Although students' Concentration and Anxiety LASSI subscale scores did not show statistically significant improvement in their overall academic experience at college, there was a strong correlation between Concentration and badges earned. Moreover, students identified the gamified curriculum as making the content less distracting. As evident by two student responses, "I never felt distracted from the course," and "I felt less distracted in this course than any of my other courses." Similar positive student perceptions of the gamification elements were also found in the research of O'Connor and Cardona (2019). Gamification has been suggested as a platform to reduce anxiety levels in students (Paniagua et al., 2019) by offering low-stakes learning environments and allowing an opportunity for failure, which appeals to first-year college students (O'Brien & Pitera, 2019). As seen in one student response, "This app sort of felt like a break and I enjoyed learning the information. My other classes are like stress and work. This was more of a weight off of my chest." Other students as well perceived this class to be a stress reducing force in their lives.

As observed between this study's outcomes and that of Brom et al. (2019), students were indifferent to XP as a standalone gamification element, but they were more vocal in their attitudes regarding XP as displayed on the leaderboards. As one student expressed, "XPs in general were more like a bonus to me." Additionally, students can learn to view failure as an opportunity instead of becoming overwhelmed and helpless (Lee & Hammer, 2011). Students in this research aligned with the student perceptions of the research by Dicheva et al. (2019) as well as the research by Donovan et al. (2013) in that they tended to be more excited about the virtual star currency than badges, as shared by one student who felt "like a BOSS!!!" However, leaderboards and badges can also promote a sense of competence (Bai et al., 2020; Sailer et al., 2017), which was the case for one student who responded on the final self-reflection learning quest that she felt like she had "accomplished something" when earning a badge.

Student responses in this study reflect those of Shroff et al. (2020) showing that they really liked EdApp as it met the characteristics of being transparent, fun to use, and aesthetically pleasing; having a comprehensible organization of course content; and being easily accessible at all times of the day. As a couple students expressed in their reflection

journal assignment responses when asked to compare the use of EdApp and Blackboard Learn, “It’s more interactive. It just felt cool. It was more than I was expecting.”, “EdApp is fun, colorful, and interesting,”, and “I love that games are part of the lesson and the stars remind me of coins in a game.” Many students also noted that EdApp was easy to use, “It is fast and smooth, making it really not annoying to work on.” and “I like the layout of the app, it is well organized.” However, it should be noted that students did encounter some hiccups with EdApp as well, “It made me restart the lesson a few times” and “it did glitch a little”. However, these glitches did not appear to temper their perception of the experience overall.

Implications

Gamification research should not be restricted to motivation, satisfaction, academic achievement, and engagement; it should also include the potential to promote teamwork and group cohesion (Bilgin & Gul, 2020). In a future implementation, it is recommended to add items to quests, perhaps adding extra-credit quests, to promote teamwork (Donovan et al., 2013) while realizing a more socially interactive experience that can help users develop social competence (Tang et al., 2020) through cooperative and collective gamification approaches (Koivisto & Hamari, 2019). An emphasis on a more social gamification experience would likely help build the participant’s social status, resulting in better retention rates and skill acquisition (De-Marcos et al., 2016). Use of the video discussion feature in EdApp, asking students to comment on various questions and concepts via the video chat, could help accomplish this.

An important element of incorporating gamification elements into academic courses is to provide students with a sense of control over how their learning takes place (Shroff et al., 2020). Moreover, when college students are given autonomy and choices through gamification, they tend to have stronger self-regulated learning skills than students in traditional, controlled settings (Lambert, 2017). Incorporating more choices of quests and activities within them, supports the notion that learners should believe they have freedom as a result of their own decisions to choose tasks or challenges presented to them (Turner & Paris, 1995). Clear goals can help structure the learning task and increase the learner’s feeling of competency and sense of autonomy (Brom et al., 2019). Learners who have a clear goal are more likely to complete a task than those who are simply told to do their best (Jung et al., 2010). During this study, badges were awarded for completing quests; however, it could have been more effective to have them match specific objectives or goals of the course (Bai et al., 2020). Incorporating badges into a leaderboard as a different means of social comparison than points (Bai et al., 2020) or markers (Hamari, 2017) may be something to consider, especially as leaderboards require participants to set their own goals, striving to place themselves at the top (Landers et al., 2017).

Other FYE instructors should keep in mind that student centered learning with the teacher as a moderator instead of lecturer, is essential in gamified environments (Lengyel, 2020). Traditional content can be refined with key salient points being emphasized on the gamified platform. Students can be savvy consumers that expect technical accessibility and adaptability of content at their fingertips, which can be addressed by the adoption of mobile apps to deliver gamified curriculum in a higher education setting. Effective gamification has the potential to help with retention, especially if delivered on a mobile app, offering the students constant accessibility (Pechenkina et al., 2017). It has been said that gamification is not about technology or a digital platform but rather the design and development of innovative instruction which incorporates game elements into activities (Zainuddin et al.,

2020). However, the technology is not irrelevant. Use of the EdApp platform made the delivery of instruction easier and better in this study. This platform had preformatting that was applied to all text, which helped to make content look inviting and consistent. Instead of offering a busy PowerPoint, EdApp distilled that content down to salient points to be presented with ample white space and the capacity for scrolling and swiping as mandated by the necessary constraints of the EdApp platform. This ensured a clear and effective experience for the student users. In order to keep the FYE intimate, there needs to be plenty of opportunity for self-reflection and communication. Given that students had numerous opportunities to self-reflect, they were able to ascribe their own relevance to content and the experience. The EdApp gamified curriculum allowed students the freedom to fail and try again, which embodies the Growth Mindset (Dweck, 2007) at its core. As shared by one student, “The aspect that motivated me the most was the growth mindset quests.” In contrast to the assumption that gamification is more time-consuming for the instructor—especially with technical issues (Daubenfeld & Zenker, 2015) and the increased amount of grading required in order to keep up with rewards and achievements (Evans, 2016)—a key benefit of gamification is that once the content is loaded into a platform like EdApp, the professor will have sufficient time to reach out to students personally and to spend time thoughtfully responding to their reflections. It should be noted, however, that the time commitment in setting up this system on the backend is significant (Bratt, 2020).

More gamification FYE studies are needed—especially those that are participant-focused and examine different types of learners. Studies need to be larger and longer, and they could examine personal versus private dashboards, especially in terms of goal-setting. Research should also be done to measure the effectiveness of different learning management systems and their potential to deliver a gamified curriculum. Implementing gamification platforms can change, for the better, how classes are taught and how the content is presented. It has been suggested that, similar to the swiftly changing field of gaming, the study and usage of gamification requires a constant review of research findings as it continues to evolve (Hulsey, 2015) both technologically and pedagogically (Banfield & Wilkerson, 2014; Barneva et al., 2017; Toyama, 2015).

Limitations

The most unexpected limitation of this study was the COVID-19 pandemic, which sent students home, and moved the class entirely online. The pandemic affected students’ dispositions both in terms of motivation and turning in assignments in a timely manner. Other limitations include that of action research itself, which is not generalizable as well as the novelty effect (Clarke & Sugrue, 1988) that is common in gamification studies (Hamari et al., 2014; Hanus & Fox, 2015). And, of course, there are the challenges associated with self-reported data. The more widespread gamification LMS platforms become, and the more they compete for adoption, the more they are likely to continually refine and update their product, which will free the instructor to focus more on student relationships and keeping their content, not the platform technology, current.

Compliance with Ethical Standards

Conflict of Interest: The authors declare they have no conflict of interest.

Research Involving Human Participants: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to Participate: Written, informed consent was obtained from individual participants included in this study. No identifying information about these participants is included in this article.

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