

***Let's Play: Using Gamification in University Classes as a Means to Increase Motivation and Engagement While Lowering Stress***

Katherine Green, The Chicago School of Professional Psychology, United States  
Kelly M. Torres, The Chicago School of Professional Psychology, United States  
Alisha DeWalt, The Chicago School of Professional Psychology, United States

The Barcelona Conference on Education 2022  
Official Conference Proceedings

**Abstract**

Worldwide, traditional face-to-face (f2f) students struggled with a rapid shift to virtual learning as did faculty who often had limited experience and knowledge of developing online courses or knowing how to engage their students. Many institutions of higher education have returned to classrooms, first with hybrid approaches, and now f2f. However, just as the world has changed, our students and faculty have changed too and many are struggling with the traditional approaches. Faculty are reporting students' lack of engagement, such as failing to turn in assignments or read material and engage in discussions. A recent study has faculty describing student disconnection with terms such as “defeated,” “exhausted,” and “overwhelmed.” Using information gained via international workshops and personal experiences, we present methods to increase motivation and engagement through the use of gamification approaches that can be used f2f or in online classes. There is a proliferation of free online tools that can be used to increase higher education student engagement and we outline and demonstrate multiple ways to bring this “playful” learning into our classes to promote collaboration and engagement plus expand our assessment strategies. Using gamification helps to promote playfulness which has been shown to lower perceived stress in adults and to facilitate lowering their use of negative, avoidant, or unhealthy behaviors (Magnuson & Barnett, 2013). This paper will address some of the current issues and provide suggestions as to how to introduce gamification ideas into higher education courses.

Keywords: Gamification, Motivation, Engagement

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## Introduction

Motivation and engagement seem to be educational buzzwords at the moment and often discussed across all program levels, more so during and post-COVID-19. Worldwide, traditional face-to-face (f2f) students struggled with a rapid shift to virtual learning as did faculty who often had limited experience and knowledge of developing online courses or knowing how to engage their students. Universities adapted to virtual learning seemingly overnight and spent one and a half years or more using this approach. Many are now coming back, first with hybrid approaches, and now f2f. However, just as the world has changed, our students have changed too and many are struggling with the traditional approaches. Faculty are reporting students' lack of engagement, such as failing to turn in assignments or read material and engage in discussions.

This leads us to the topic then of how to motivate students so that they will engage with the learning process more deeply because we know from research that high motivation to learn is linked to better academic performance and to greater conceptual understanding of ideas, satisfaction with school, and higher self-esteem and adjustment (Gottfried, 2009; Gottfried, 1985; Ryan & Deci, 2009; Ryan & Deci, 2000). Our first step toward increasing learner motivation is to conceptualize it and what that actually is in terms of our specific goals of the course and program. Does it mean all students demonstrate an intrinsic push to learn, thus they do this with no promise of external reward? In other words, they are attending and studying simply for the joy of learning. Or, as with so many tasks in life, is their motivation more extrinsic in the form of knowing high grades will maintain their scholarship and the degree will lead to a promotion. The bulk of students in higher education are a mix of both extrinsic and intrinsic just as most people are; however, having an understanding of the general motivational states of the students in our classes will help us develop learning and assessment strategies that can help promote success.

We know there are different frameworks for thinking about motivation; however, we most generally agree on some specific factors' students need to have for motivation. Particularly, students need:

1. Competence, which is the belief that they're capable of doing something,
2. Autonomy or control, which is the ability to set appropriate goals and to understand the relationship between their effort and the visible outcome,
3. To have interest or see value in completing the task,
4. Relatedness, which is the need to feel a connection to either a group or social element aligned with the task/learning (Murray, 2011; Pintrich, 2003; Ryan & Deci, 2000).

We have to keep these concepts in mind as we move to developing our courses and find ways to increase the active learning in each class. This then leads us to engagement, another buzzword often heard as faculty bemoan their struggles to keep student interest and learning high. This too though requires us to step back and ponder what do we mean in each individual class when we examine engagement. Does it mean in a virtual setting that all students have their camera on and are staring at the screen? Does it mean students speak in each f2f class and take part in all discussions? Or does it mean students turn in quality work on time?

We all want to look out on a full class of excited, bright-eyed students eagerly trying to jump into discussion and demonstrate they have a solid understanding of the readings. We need to

realize that individual differences mean that many of our students may be introverted and uncomfortable speaking out or culturally they may feel inhibited about sharing information or demonstrating their knowledge (or lack thereof). Realistically students may have had a very rough week and been unable physically or emotionally to have read the material or perhaps they struggled to understand it. One theory that examines this struggle with understanding is cognitive load theory (Leahy & Sweller, 2011) which looks at the amount of working memory we possess. The theory posits that learning happens within a given range of information; if the cognitive load is too low then learning is inhibited; too high and it creates anxiety which shuts the learning down. The sweet spot lies between these two, and can, in addition to providing new learning, also allow us to enter a state of flow. This state of flow (or being “in the zone”) is the mental state in which a person who is performing an activity is fully immersed in a feeling of energized focus, physically and emotionally involved, and is enjoying the process (Csíkszentmihályi, 2008).

We can see cognitive load being applied at the just the right level and approach to trigger flow during those times we are fully engaged with our students, and they are discussing and commenting back and or working on a project together, only to suddenly realize class ended five minutes ago! Rarely though does this occur with the Sage on the Stage approach whereby the faculty is lecturing and reading material aloud to students. The state of flow is about engaging with the learning in a far more active manner, while understanding individual differences in temperament. There are a multitude of reasons that students will demonstrate a range of behaviors within our classrooms, and it is the faculty’s responsibility to identify what constitutes engagement in their course which leads to the ethical challenge of trying to find out what works best for them.

## **Collaborative Learning**

One approach that has been shown to increase engagement is collaborative learning, which is the educational strategy using pairs or groups to enhance learning. There are many ways to foster collaborative learning amongst students in a f2f classroom setting. Group work, pair and share, discussions, and group problem solving are all examples of ways to facilitate collaborative learning in a classroom (Rutherford, 2014). With the onset of the COVID-19 pandemic, f2f classrooms needed to swiftly move to virtual learning and build virtual social learning communities. While we may not need to mandate virtual learning now, regardless of the learning modality, there will always be a need to ensure students are able to collaborate with each other and their faculty in ways that continue to support engagement, reduce transactional distance, and foster social learning communities.

In a virtual classroom, although students and the faculty are physically distanced from each other, there are tools and best practices to foster collaborative learning through social learning communities. Wankel and Blessinger (2013) postulate that, “Building social learning communities within the classroom has the potential to foster a greater sense of belonging, interactivity, and group cohesiveness which are important factors in student motivation and their willingness to participate in such communities.” Leveraging technology is only one component to foster social learning communities and further collaborative learning. Instructors also need to ensure the pedagogy and content is paired correctly to the technology in order to further learning (Wankel & Blessinger, 2013).

There are many reasons to use collaborative learning. First, collaborative learning bolsters high engagement from students, between students, and with the faculty. Students have to

communicate with each other in order to successfully complete the task. Additionally, it provides students a forum to practice additional social and leadership skills through working on group projects. This also allows for students to learn from diverse perspectives, working on a team with individuals from different backgrounds and experiences. Furthermore, research on collaborative learning has also demonstrated an increase in student self-esteem, social skills, and responsibility (Sultan & Hussain, 2012).

In order for collaborative learning to be most effective, there are some strategies for faculty to consider. Foremost, set expectations early. If group work is going to be an expectation in the class, let the students know early so they can best prepare. Next, ensure the directions and rules for participation and grading are clear. It can be challenging for groups to come together and when they do, time needs to be focused on the collaborative learning tasks, rather than trying to decipher the directions. Students will also want to know if they will be evaluated by their peers and/or the faculty. Finally, consider if the students need any training prior to the collaborative learning project. It may be helpful for the students to complete a self-reflection or team building exercise prior to their group work.

### **Assessment**

Another way to promote engagement is to effectively use assessment. Course assessment provides valuable insight for faculty and students to monitor learning and progress toward achievement of the course objectives. Although assessment is considered a key element in the teaching and learning process, faculty do not always create effective assessments or adequately capture students' progression toward meeting course objectives. However, assessment highlights the pedagogical purposes that impact student learning (Wu & Jessop, 2018). Assessment within our class settings can be described as formative and summative and both of these assessment types are considered as equally important in understanding student learning gains. However, these two types of assessments provide different types of data that is valuable for both faculty and students.

One type of assessment is formative which helps to capture students' levels of understanding and allows faculty to identify any misconceptions, struggles, or learning gaps that are experienced by their learners. These frequent and often informal interactive assessments allow us to readjust our instruction and provide opportunities for the monitoring of our students' learning. When incorporating formative assessments into our classes, we should ponder questions such as "what learning is taking place in our classes," "what are our students not learning," and "how can we better support our learners?" These types of assessments are not typically graded or are weighted very low in students' overall final scores.

Another type of assessment is summative which focuses on students' performance of understanding course concepts. We use summative assessments to evaluate our students' learning, skill acquisition, and academic achievement. When we administer summative assessments, they are typically in the form of tests, assignments, or projects. Generally, we assign summative assessments at the conclusion of a specific period of time (e.g., mid-term exams, final exams) which makes them evaluative of a range of course concepts that students have learned in our classes. These assessments are weighted more heavily and impact students' final course grades.

When integrating assessments into our classes, we should consider what technological tools can help us best capture student learning and allow for the automation of grading and student

learning performance. Technology-enhanced assessments allow for innovative and engaging forms of informal data collection of student performance. The inclusion of technology provides students with real-world learning experiences that incorporate higher-order thinking skills (Devedzic & Devedzic, 2019). Further, utilizing technology in assessments allows us to provide greater variety and authenticity, allows for alignment with learning objectives, increases learner engagement, integrates autonomy, promotes efficiency in assignment submissions, results in immediate feedback, enhances opportunities for learner response to feedback, and ensures evidence of the effectiveness of curriculum design and delivery. However, when integrating technology into assessments, we need to consider factors such as accessibility issues, students' sense of isolation, hardware and software complications that prevent assessment from taking place or result in inaccurate saving of student submissions, challenges of students engaging with the technological tool outside of the classroom, difficulties of confirming the identity of students, and need for professional development training.

Researchers have continuously demonstrated that the implementation of technology-enhanced assessments positively impacts students' performance (Alavi et al., 2021; Jopp, 2019; Khalaf et al., 2020). Therefore, we need to consider how the inclusion of effective assessment techniques and approaches provides us a lens for understanding student learning, identifying invisible barriers, and helping educators improve their instructional strategies. This insight is vital because when we measure student learning through assessment, both faculty and students both receive vital insight to the extent that learners are achieving our established learning objectives. Effective assessment techniques enable students to demonstrate their learning as well as enhance their capacity for future learning (Winstone & Carless, 2020).

## **Instructional Technology**

This section provides examples of technological tools and f2f activities that can be used to increase learning and engagement in both f2f and virtual learning environments. The tools can also help us with assessment so that we can measure engagement (using multiple definitions of this) and hopefully increase motivation to learn. Additionally, these tools provide ample collaborative learning opportunities to further assess, motivate, and engage our learners.

### **Online Tools**

Trivia games and quizzes are engaging approaches that can be used to assess students on the material being taught. They are a fun and interactive way to bring gamification to the class and test student's knowledge either by having them play individually or in teams. Many online informal assessment tools allow students to log in using their phone/iPad/or laptop with a QR code or going to the link and putting in a short code. They can choose to put their name or a pseudonym in (faculty can decide if students need their real name or if they want to be anonymous then they can choose a pseudonym and inform the faculty member what this is; if assessment is part of this quiz). Faculty then start the quiz and can choose to show students on a live screen how everyone is doing along the way, or they can keep this until the end or even have it remain private. Faculty can choose the length of time between questions, type of question, and also pull in various media to the question. Many platforms allow for quiz data to be downloaded at the end to a cvs document.

Polling can also be a fast way to garner student input and let you know if they are understanding the material. For instance, faculty could ask them a specific knowledge question and if many do not seem to be at the level expected, an instructor could stop presenting new information and work on that concept, perhaps by having students turn to a partner and discuss and explain it to each other or similar active learning ideas. Ideas for polls include issuing anonymous surveys for feedback, tracking student attendance (put all their names in the poll so they have to check it; but set so that students can only answer once!), hosting speed competitions, and checking understanding. Question and answer formats can also be used prior to exams.

Using group activities through a social wall is a way to have students provide ideas or graphics in a group format so that all can be working on the project at the same time. The social wall keeps growing with the posts and can increase the excitement of an event. Faculty could use this for an onsite conference or capstone presentation event, etc. However, it is also a very solid tool to use in class for learning.

Some examples of how we can use this include assigning a research topic and having students individually post links to research or sites that address it. Building a social wall for initial connections with students (first day activity) can provide a visual connection as students post pictures of the chosen “task.” It can also be used to kick start the learning topic of the class. For instance, in a recent Psychology of Teaching and Learning class, one author asked small groups of students to work together and find a picture of a quote that they felt best captured their definition of learning. They then shared this on the social board and the full class was able to jump into discussion of each of the quotes. The same activity was then done at the end of the class and then compared to the first wall of quotes to examine if students felt any different.

Online virtual bulletin boards can be accessed as an app or website-based platform. Students can create information onto the virtual bulletin boards using a template or blank canvas. The platforms have the ability to allow students to upload, insert, or drag and drop documents, images, text, weblinks, and videos. Virtual bulletin boards typically contain voting and comment features as well. They are a great tool to use for collaborative group projects, as it allows for students to work together asynchronously while still being able to observe changes and contributions from group members.

### **Information Sharing Platforms**

Blogs are a great way for instructors and students to share information and collaborate with the broader community through disseminating information in their blog and allowing readers to comment on their posts. Many online blogging systems are built for educational uses. Instructors can create class blogs, assign group projects, or even assign written work through these tools. For blogging assignments, teachers and students can create websites and blogs that are secured within an educational community and still have the option to share publicly. Blogging platforms contain many features that allow professors to customize their experience, such as widgets that provide links, tags, author lists, text boxes, and searches.

Content development can be collaborative through engaging with ePortfolio platforms, with groups working together to share files, videos, and projects. The layout of these digital portfolios is dynamic with large images and limited text on slides. Instructors can create their own ePortfolio and share content with the students or assign students collections to add to or

comment on. Collaborative tools can also be utilized to in order for groups to upload weblinks, videos, social media posts, etc. into a shared space and organize content into collections. Instructors and students can add directions, ask questions, and comment on the shared content. Users can also record videos of themselves, providing an additional opportunity for engagement and collaboration.

### **Face-to-Face Tools**

Gamification approaches in the class can be a solid technique to promote active and engaged learning. They can be adjusted to incorporate team or individual competitions, practice skills, or build new knowledge. Behavioral approaches of rewarding via leaderboards or simply assigning points (or deducting points) on a white board makes a fast-paced reward system that engages the bulk of students. From experience, chocolate can also be a very engaging reward!

Having students work in small groups to create these activities as part of their course work is a good strategy for their learning of the topic and of course it helps release the load of the faculty member. Games that the students know from childhood can be adapted to include the material.

### **Crosswords and Word Search**

Some examples of these include team-based crosswords or word search puzzles. These can be created online and then printed out and placed on cardboard to use in the class. There are multiple websites to help develop crosswords and clues and words can be taken from the lecture notes or even prior to exams. Then students can be divided into multiple teams, given the bag of letters and clues with a race to see who finishes first. There are also sites to do the crosswords or word searches online and so small groups can work together either through virtual formats such as Zoom or if f2f, with phones or laptops.

### **Snakes and Ladders**

A similar idea is to use either an online or printed version of the game snakes and ladders. The organizers create questions that need to be answered about the course material and correct answers move the number rolled on the dice. There are many dice rolling sites or game timers as well! These can be put up on the digital screen or individual students use them on their phones. Pulling in an introverted student to be the “roller” or scorekeeper can also be a way to engage even the students who normally sit in the back and disengage. More games such as this can be introduced with a little imagination.

### **Assessment Technologies**

These types of technology allow for gamified polling, discussion, and quiz options. Particularly, when using these tools, we can create pre-class activities to assess students’ background knowledge of topics that we will be teaching. This information informs us of what students already know about the topic and what foundational skills that they need to acquire. We can also use this tool to create lecture summaries to evaluate students’ comprehension of the lesson. To make this activity collaborative and engaging, we can create mini competitions in which groups of students compete in a friendly competition to determine who can answer the most questions. Essentially, this platform provides a plethora

of options to capture formative assessments through engaging and collaborative activities which include:

- **Brainstorming for assignments:** faculty can pose a question related to an assignment and have students share their thoughts of how to complete. For example, faculty can provide students autonomy in how to complete their assignments and students can share their assignment preferences (e.g., written assignment, oral presentation, timeline, etc.). This approach allows for student engagement and motivation in their assignments and provides faculty the opportunity to account for learning preferences within assignments and capturing assessment data. Another option is for faculty to create presentation topic options in which students select their topic preference. Similarly, this activity allows for students to have autonomy in their assignments further enhancing their levels of motivation and engagement and can promote opportunities for collaborative learning opportunities in which students can be grouped together randomly.
- **Word Clouds:** faculty can create engaging word clouds focused on the key discussion themes to highlight the most salient aspects of the lesson. This activity can be expanded to include collaborative discussions regarding which topics may be of most interest or importance to students. This activity can motivate students in the learning process and help provide faculty opportunities to informally capture an understanding of students' comprehension of the course content.
- **Backchanneling:** in lieu of creating discussion questions, students can pose questions anonymously to start a discussion. Through this activity, faculty can determine areas of uncertainty and motivate students in the content. This discussion approach can enhance students' engagement in the class discussion since they can provide input.
- **Real-time reactions:** students can submit their reactions to a video, peer project, class activity, or discussion topic. By submitting their reactions, students are engaged in the activity. Faculty can also incorporate this type of feedback into their evaluations of students' work and receive valuable insight into the areas and activities that students find most appealing.
- **Note sharing:** this activity can be helpful in creating a collaborative learning environment since students share their class notes with their peers. They can upload photos of their typed or handwritten notes to provide support to their peers. Faculty can also review the students' notes to ensure that they are accurately understanding the lessons.
- **Peer review:** this interactive and engaging activity incorporates the use of student feedback in the form of "likes" and comments on each other's posts. Student feedback can be used to informally assess students' levels of comprehension and to engage them in the lesson.
- **Poll and quiz questions -** faculty can create and share comprehension questions focused on the course concepts. Student performance on these activities can be used as course grades. Debate and group discussions can also transpire from poll questions.

This interactive assessment tool allows for us to receive instant feedback of student learning through engaging and motivating formats. For example, we can capture on-the-spot formative assessment data of students' comprehension of course concepts. Also, data that is collected can be displayed via student mode and graph mode. Ideas for this platform include:

- Team competitions: this technology tool can be used to create groups of student teams to review course content. By completing this activity, faculty and students can determine their understanding of concepts for an upcoming test or project. Team competitions can also engage and motivate students in which they are in the flow of learning resulting in enhanced levels of knowledge acquisition.
- Poll questions and voting: students can respond anonymously to questions focused on newly learned concepts or select a topic for class activities or assignments (e.g., do you want to conduct a presentation or write an essay on this topic?). By providing students autonomy in the lesson, they are more engaged and able to demonstrate their knowledge by completing assessments in a format that is most closely aligned to their learning preferences and styles.
- Selecting groups or topics: students can select their assignment topics or groups for projects. For example, faculty can include a list of five available presentation topics for students to select. All students who select the topic are then assigned to work together on the presentation.
- Student generated questions: faculty can require students to generate discussion questions or multiple-choice questions for a test review. Through this activity, faculty can identify which topics students perceived as most important and assess their understanding of the concepts (e.g., did they phrase the question correctly, is the correct answer provided).

Assessment apps additionally provide options to create quizzes, surveys, and mini competitions to assess student learning. Features include the ability for us to upload our class rosters, customized folders for assessments and reports, and provides the ability for students to use the silent user hand option for anonymity. Ideas for this platform include:

- Exit tickets - students can demonstrate their levels of understanding of course content prior to leaving the class. Faculty can ask students questions related to the most important lesson points and determine students' comprehension of these concepts. If many students select the incorrect answer, faculty can reteach or provide alternative lessons or activities in order to help students to grasp an understanding of the lesson components that they did not understand.
- Pre-assessment - faculty can check students' background knowledge of a topic prior to teaching it. This type of informal assessment can be valuable for complex concepts that build upon prior lessons.
- Visual data - graphs can be displayed to demonstrate students' comprehension of course topics. By asking students questions related to the lesson, faculty can quickly create a graph to display to students that illustrates the percentage of the class that answered correctly. This valuable insight allows for faculty to clarify misconceptions that a large majority of students possess.
- Quizzes - in-class quizzes can be administered before, during, or at the end of the class. These types of interactive activities can be used to commence discussions or to capture students' attention during lectures.
- Reflection - students can share their reflections of class activities and assignments. This data can be used to inform faculty of program curriculum that is most valuable to learners. Students can also be encouraged to provide constructive feedback on how to improve assignments or additional focuses that may need to be integrated into the course.
- Voting - students can vote on the best response provided in a class discussion. This friendly competition approach can be used to engage learners. For example, students

can vote on the best presentation, most creative response, or the most engaging group project.

## **Conclusions**

In conclusion, worldwide students in higher education are still struggling post COVID-19 with returning to high levels of engagement and enthusiasm for learning. Finding ways to motivate students is imperative in order to ensure better academic performance, higher conceptual understanding of ideas, and increase self-esteem (Gottfried, 2009; Gottfried, 1985; Ryan & Deci, 2009; Ryan & Deci, 2000). Using some of the technology ideas stemming around gamification approaches can help increase motivation and engagement in students of all ages and levels. Adapting our own teaching approaches is an ongoing process of discovery and hopefully gamification ideas can help both students and faculty.

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**Contact email:** Kgreen1@thechicagoschool.edu