Gamification of Learning

By Alyssa Oppertshauser

Anyone who works with young children knows that they are naturally curious and love learning. They're constantly asking questions like: Why is the sky blue? Where does wind come from? Why do worms always come up when it rains? However, by high school, students have often lost the wonder that drives learning. They can perceive science as difficult, time-consuming, and boring. Although science can be tricky, and can take effort, I started wondering why it's perceived as boring.

In the first year of my teacher's education program, I was inspired by a TedTalk from Mark Rober, a former NASA engineer who now makes educational content for YouTube. He says the fear of failure can decrease learning, but that everyone demonstrates natural enthusiasm and persistence in one aspect of life: video games (TED, 2018). He suggests that "by reframing the learning process and focussing on the cool end goal, the fear of failure is often taken off the table, and learning just comes more naturally" (TED, 2018). This idea of gamifying learning to increase engagement and decrease fear intrigued me, so I decided to try it in my next practicum.

The first activity I made was for a grade 9 math class. I noticed that many students were disengaged or paralyzed by math anxiety. To solve this problem, I designed a gamified lesson (see resources here). The students were spies trying to prevent a train collision due to sabotage on the tracks. In groups of three, they used intel to construct equations representing the train tracks, plot these equations on a graph (overlaid on a map), and then decode intercepted transmissions to determine where the sabotage point was. If time remained, they were instructed

to prove the intersection point using algebra. The activity was a huge success. Rather than having to convince students to work, they were naturally engaged.

Motivated by this success, I continued to develop gamified lessons. In my next practicum, I created a gamified activity for a senior chemistry bonding unit test review. It involved answering multiple choice questions, unscrambling the letters to make a chemistry related password, and using this password to boot up the "test-reveal-inator" that was supposed to give them information on the test. I noticed that this class seemed to struggle with performance and test anxiety, so I leaned into a goofier attitude with this activity to create a more relaxed atmosphere. Again, I saw great success with the activity.

I decided to seek student feedback and ask permission to use their submissions anonymously. One student said, "I liked the humor of the review, it helped a lot in easing the stress for the following day of the test. Also, the idea of a puzzle, made me think more critically." Another student "thought it was really great and helped [them] understand the topic. The time limit helped create a test-like environment but without the stressful pressure." A third student said, "it was fun; definitely more engaging than a sheet of practice questions."

This last comment made me laugh because I had, in essence, given them a sheet of practice questions, but the way it was framed made all the difference. I started with a story, used theatrics and high energy, randomized groups, and incentivized with a small prize for the winning team. I believe all these small details helped the students to see this practice sheet as not just another test review, but a game. Moore-Russo et al. agree in their article on integrating gamification into course design. They state that simply adding a few elements of games (like leaderboards) to normal class activities isn't sufficient (Moore-Russo et al., 2018). Gamification should allow students to imagine, explore, and collaborate, and ways to accomplish this are, "inserting

elements of randomness, integrating a narrative, allowing students the freedom to fail, and integrating authentic opportunities for practicing skills" (Moore-Russo et al., 2018).

One drawback that a student mentioned is that since the review was limited to multiple choice, it didn't prepare students for some of the harder aspects of tests like short answer questions. I kept this feedback in mind when creating the gamified activity for my final practicum. It was a midterm review covering the chemistry and physics units of grade 10 science ([see resources here](#)). I really leaned into the story elements, crafting a spy adventure where the students were trying to steal a diamond. I also varied the types of questions, including not just multiple choice, but also math and ray-diagram questions. This activity is the culmination of everything I'd learned about gamification of learning.

Through this journey, I've discovered that gamification of learning can be a very effective method for engaging learners. However, it can also be very time-consuming, which is not always feasible in the business of the school year. Moore-Russo et al. (2018) mention that the time investment required is one big pitfall of gamification. That being said, simpler gamified activities, like the one I made for the chemistry class, don't take very much time or effort to create and clearly make a big difference to the students.

The possibilities for gamification are limitless; they could even be integrated into summative assessments. Bistulfi saw tremendous benefits when they incorporated a biology themed escape room into the final evaluation of their course, especially in terms of soft skill development (Bistulfi, 2021). "Professionally, problem solving does not stop at the wrong answer. We have to teach our students to collaborate, ask for help, and tackle problems until solved" (Bistulfi, 2021). And from my experience and research, gamification of learning is an excellent way to do just that.

Works Cited

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