Gamification and Badging in 8th Grade Science.

Background

Since I started teaching 8th Grade Earth & Space Science at Konawaena Middle School two school years ago, and after have been teaching Mathematics since 2006, I have looked in, and played with, online curriculum. Last school year, I used an Open Source curriculum, https://www.ck12.org/user:SeppAloha/book/CK-12-Earth-Science-Onipaa/r9/ , in addition to various free and paid-for resources, such as NASA resources, USGS resources, and the Dr. Birdley Cartoons on Earth & Space Science and Scientific Method (http://birdleymedia.com/books.php ). This school year I am combining the CK12.org and the Pearson curriculum into a face-to-face with online asynchronous access.

Many of my students (92%) come from a broken or troubled home, receive free or reduced price lunch, are English Language Learners, or are Migrant Education (fishing, hunting, farming) students, and do not understand or see the value of education as a means to advance in the socio-economic ladder.

To ensure better participation and buy-in of my students in 8th-grade Science class, I looked at what my current students seem to be interested the most, and found that the majority of my students have access to/or enjoy activity on Social Media and enjoy online gaming.

As State testing and other high-stakes tests are part of my 8th-grade students’ school year, I also want to ensure solid understanding of the Earth & Space topics, by adopting a solid Constructivist strategy: the 4-E Learning Cycle. This strategy is based upon Engaging students in the new knowledge, letting students Explore the knowledge through lab or hands-on activities, letting students
solidify knowledge through peer interaction and Explanations, and Evaluating students through various types of assessments.

Content

As of School Year 2015-2016, my school has adopted the paid-for Pearson Curriculum (Pearson SuccessNet) for 6th, 7th, and 8th grade Interactive Science (Physical, Life, and Earth & Space Science respectively), which incorporates online access to the e-textbook and student workbooks. In addition, my school has adopted Google Apps for Education (GAFE), which allows for a digital interface: Google Classroom.

As I value the Open Source access and personalisation of the CK12 resources, and it allows for Google Classroom integration, and Pearson allows for individual student access and linking, I have now found a way to combine both digital resources into my Google Classroom interface.

Building upon Constructivist approach of learning, using prior knowledge and discovery learning, I am guiding my students through activities and problem-solving techniques, based upon the Scientific Method, to learn about our Earth’s Structure and Processes, and the way our Solar System and Universe came to be. In addition, knowing that my students enjoy Social Media and Interactive Gaming, I am studying the effectiveness of Gamification in my classroom. In addition, my students value recognition for achievement, participation and
performance, so I am also incorporating the use of a digital Badge system (www.Credly.com) in my classroom to allow my students to experience a pride and recognition factor.

My lessons are mostly student-driven, in which I only present a new topic or idea, and in which my student will learn this new knowledge through discovery learning or activities, labs, web quests, and peer interaction.

Asynchronous

My students will be directed to access the digital and paper resources, activities or labs in a small-group setting, to allow for discovery learning and peer support and discussion. These resources will be available through CK12.org, Pearson, various open-source web quest, assessments and paper-pencil worksheets. While the content of the lessons are available in real-time during class, they will also be available online through Google Classroom for individual access for re-teaching and resource purposes. The Google Classroom is also the means of submitting assignments, homework or quizzes.

Synchronous

While myself, as teacher, will start and direct the synchronous activities, my students will perform these assignments in heterogeneous peer groups or as individual activities. Some activities might include Round-Robin, Think-Pair-Share, etc sessions during our 3-4 times per week 74-minute classroom meetings. These synchronous meetings will allow for either introduction to new knowledge, solidification and assimilation of the new knowledge, following the 4-E learning cycle.

Another real-time component, is the gamification aspect, by using an online, data-gathering tool: Kahoot!(www.getkahoot.com). Kahoot! is a fun and competitive game-based assessment tool. https://youtu.be/PYfoRRTlXys. While Kahoot! is a fun, digital means for students to participate in a game, it is in fact an assessment tool, which allows for both formative and cumulative assessments along a comprehensive data analysis of the
questions and answers, which allows not only for easy grading, but more importantly for easy isolation of topics that show misunderstanding, or are in need for re-teaching. The questions asked during the assessment are teacher created, and thus fully customizable for your class groups.

Assessment

As just mentioned, Kahoot! is my tool to be evaluated this school year as a means for quick checks for understanding during face-to-face classes, but also as an overall assessment tool. Since Kahoot! is designed to be a fun and interactive means for students to participate in assessments, it also provides immediate feedback to students on who answered correctly, the fastest, etc. In addition, on the teacher side of the interface, it provides valuable feedback on who answered correctly, but also, if the majority of students answered incorrectly, which incorrect answers were the most prevalent, and this allows for easy analysis of correct and incorrect answers and an easier understanding of which wrong answers were more prevalent, which also allows for understanding of misconceptions and what needs to be re-taught.

For students who do not have access to the Internet, Kahoot! allows for print-out of assessment questions along with answer key for easy grading.

In addition to games, my students also live for recognition. To allow for individual and peer-group recognition, I am also using a Badging system through Credly (www.Credly.com). The Credly Badging system will allow students to individually earn “bragging rights” in a classroom “Hall of Fame” monthly recognition, in addition to obtain better grades per Badge earned for their Science grade, but it will also allow me for easy evaluation to recognize students for Academic Excellence and Academic Growth for our school’s Quarterly Awards Assembly. Badging allows for immediate feedback to my students, along with positive reinforcement for knowledge acquisition. Positive behavior will also be improved by the Badging system as badges will not only be issued for performance in the Science Standards, but also for behavior and classroom citizenship.