Problem Identification

Saskatchewan Science Curriculum – Earth's Crust Unit

Incompletion of the requirements for MDDE 610 – Fall 2017

Assignment #1

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Problem Identification – Saskatchewan Science 7 Curriculum

Overview

In Saskatchewan the current grade 7 science program covers the following four units: Mixtures and solutions, Earth's Crust, Heat and finally Interactions with Ecosystems. A detailed list of the outcomes expected of the students is listed on the Ministry of Education's website.

Recently the Ministry has published a new textbook and accompanying teacher guide called Saskatchewan Science 7. While this is well designed textbook it lacks tie-ins to effective multimedia resources that can bring these science themes to life.

Details can be found here: Pearson Science 7 Textbook.

For this course we will look specifically at ways we can utilize technology to enhance and improve the Earth's Crust unit.

Description of the Students

The students are aged 11 to 12 years old. While all have experienced science in past grades, their knowledge and understanding of science concepts vary widely. For the purpose of this unit we will assume that the students have no past knowledge of the Earth's layers and have a limited understanding of the forces and natural events that are a result of changes in the Earth's Crust.

Description of the Organization

The organization I work for is the Saskatchewan Rivers Public School Division. This division oversees public education in the Prince Albert and surrounding area. The school division has 31 different schools and employs over 1200 teachers and support staff. Its motto is "Excellence for every learner". All teachers strive to provide the very best in teaching and learning supports so that all students can achieve excellence. For more information please visit the following website: https://www.srsd119.ca/

Description of Current Teaching & Learning

Teachers are expected to meet the grade 7 science outcomes outlined on the ministry website. All grade 7 classrooms currently utilize the Pearson Saskatchewan 7 textbook as the core of their teaching practice. This textbook covers the material and provides demonstrations and simple experiments to enhance students understanding of the concepts. Most schools in the division do not have a dedicated science lab and therefor the class is taught in regular elementary classrooms. This can limit the ability to do demonstrations and experiments. Also some classrooms may have a limited supply of textbooks and possible have limited science supplies. Most schools classrooms are equipped with Smart Boards or other computer projection apparatus and many teachers use these daily within their teaching.

Beyond that teachers are given choice on how they wish to teach the program and what enhancements they utilize. This leads to a wide level of variance from teacher to teacher on what tools are utilized and how the content is covered. While choice is good some teachers find the task of designing Smartboard programs and overall units daunting. Some find that the language in the textbook to be difficult for their students to understand and may not utilize it to its full extent.

With respect to learning students can find the textbook challenging to read. Students are still learning how to read expository text (i.e. textbooks and instructional manuals) and find these written sources difficult compared to narrative forms of writing (i.e. novels and storybooks). Due to this challenge students may lack the motivation to read and study the textbook. Teachers therefor need to design and deliver engaging lessons to help grab the student's attention and help them learn the textbook content.

Students these days are naturally drawn to and utilize different forms of multimedia. YouTube video's, social networks and mobile devices have an inherent engagement factor. If teachers can find a way to utilize these tools within the classroom, they can help the students to learn on their terms in ways they are comfortable with. A proponent of mobile device use in the classroom, Kolb stated "Cell phones facilitate learning anytime, anywhere, from any source, at any pace. Twenty-first century students don't want

learning to be confined to a classroom or even a library" (Kolb 2011). Teachers can help students learn how to utilize technology they are familiar with to enhance their learning. "Kids already know how to use their devices, but they don't know how to learn with their devices. It is the teacher's role to help them discover how to connect content, one another and learning with a device that they may have only used for texting and Facebook previously" (Schwartz, 2014).

Course Description

The Earth's Crust Unit in one of four in the Saskatchewan Science 7 curriculum. There are three outcomes that students are expected to achieve by the end of the unit:

Outcome: EC7.1 - Analyze societal and environmental impacts of historical and current catastrophic geological events, and scientific understanding of movements and forces within Earth's crust.

- This includes an understanding of the layers of the earth. How convection works and the causes and effects of volcanoes, earthquakes and tsunamis.
- Be able to explain how scientist predict and measure natural disasters (i.e. seismograph and Richter scale)

Outcome: EC7.2 - Identify locations and processes used to extract Earth's geological resources and examine the impacts of those locations and processes on society and the environment.

- This outcome includes being able to distinguish between rocks and minerals.
- Classify rocks and minerals based on physical properties such as colour, hardness, cleavage, lustre, and streak.
- Understand the processes used to extract primary mineral resources in Saskatchewan.

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Outcome: EC7.3 - Investigate the characteristics and formation of the surface geology of Saskatchewan, including soil, and identify correlations between surface geology and past, present, and possible future land uses.

- This outcome includes be able to model the processes of formation of the three major types of rocks: sedimentary, igneous, and metamorphic.
- Explain how geologists use the fossil record to provide evidence of geological history.
- Describe examples of mechanical and chemical weathering of rocks.

Teachers can work through the textbook to cover all these topics, but the literature can be a bit challenging and lack excitement for the students.

Why does the Science 7 curriculum need improvement?

While the science curriculum and the Pearson textbook cover the content that students are required to learn. The language used in the textbook, along with the very nature of the textbook itself, limits the engagement of the students. In science class I believe that students need to be engaged in their learning and that simple lectures and readings will do little to motivate students to take an interest in science. I believe that technology can play a large part in building students interest in the subject matter and helping them understand the concepts deeper. As Bates states, "in the last ten to fifteen years, technology has been increasingly influencing the core teaching activities." (Bates, 2016)

With respect to the Earth's Crust unit, many concepts within the unit are hard for the students to experience physically. For example, it is not likely a student born and raised in Saskatchewan has ever experienced a volcano, earthquake or tsunami. Utilizing classroom and mobile technology to investigate places in the world, watch videos, experience virtual reality or have synchronous discussions with real

scientist working in the fields, will help to grab student attention and further their understanding. I believe there are many ways that the science curriculum can be enhanced utilizing technology.

References:

Bates, T. (2015). Teaching in a Digital Age: Guidelines for Designing Teaching and Learning. (1.7 – From the periphery to the centre: how technology is changing the way we teach). Retrieved from https://opentextbc.ca/teachinginadigitalage/chapter/section-1-7-from-the-periphery-to-the-center-how-technology-is-changing-the-way-we-teach-2/

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