Open Educational Resource Critique: CK-12 Solutions Lesson

Weeks 3-4 Learning Task

OLTD 502

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Introduction

In order to critique the science learning activity provided by CK-12, Solutions, I have chosen to evaluate it against the Universal Design for Learning (UDL) framework. I chose this particular framework as my point of reference as UDL is intended as a framework for designing learning experiences for a wide range of learners (National Centre on Universal Design for Learning, 2010). Each classroom situation includes learners with a diverse range of strengths and needs. My particular teaching situation is somewhat different in that it includes students learning solely at a distance and some who learned in a blended format. Experience has shown me that many of the students who come into this particular type of learning environment do so as a result of learning needs that were not being adequately met within the community bricks and mortar schools. As David Rose described, these are often students who have been underserved as they are falling at either end of the spectrum, possibly struggling, possibly gifted, or a combination thereof (National Centre of UDL, 2010). This makes it essential the the learning opportunities that these students are provided with be carefully designed with diverse and complex needs and contexts in mind. I also appreciate that UDL does incorporate the backwards design approach of Understanding by Design (UbD) by first considering the learning goals, but believe that UDL provides a more comprehensive framework overall.

Resource Critique

The Universal Design for Learning framework proposes that we begin the process of designing learning opportunities by asking two questions:

1) What are the learning goals?

2) What are the barriers that exist?

Afterwards, the planning actually begins and involves 3 Principles for Design:

1) Provide multiple means of representation.

2) Provide multiple means of action and expression.

3) Provide multiple means of engagement.

(BC Ministry of Education, 2019; National Centre of UDL, 2010)

It is these two questions and three principles that I will use to break down and evaluate this resource.

What are the Learning Goals?

The description provided by CK-12 states that this learning resource, "Provides an overview of solutions, defines soluble and insoluble, and gives examples of solutions in different states of matter" (CK-12, 2019). This in and of itself gives the students some idea of what they are to be learning about, however it is not an explicit statement of the learning goals, nor does it provide the students with information about what they will be able to do or how their achievement of the learning goals will be assessed upon completion on the activity. CK-12 is an American resource that makes many references to the Common Core curriculum. This means that it does not necessarily align with the British Columbia Ministry of Education curricular outcomes. The materials need to be sifted through in order to find resources that match our specific learning outcomes, and the grade level that the materials are presented at may not align very well with the grade level of our students needing to learn about the specific topic. In this case, the

CK-12 resource is targeting Grades 7 and 8 learners. The BC Science curriculum learning outcomes that I am aiming to target with this resource are at the Grade 5 level. Specifically the content outcome is:

- Students are expected to know solutions and solubility (eg. separation methods, properties of solutions, dissolving)

There are many related curricular competencies that are ideally addressed many times throughout the year and the goal is to have at least a few specific ones focused on in each scientific investigation that the students carry out. The related curricular competency outcomes that I would want to address while exploring this content area include:

- Students are expected to be able to
    - Make predictions about the findings of their inquiry
    - Observe, measure and record data, using appropriate tools, including digital technologies
    - Compare data with predictions to develop explanations for results
    - Suggest improvements to their investigation methods

(BC Ministry of Education, 2018)

If the students worked through this lesson they may be able to meet the desired content knowledge outcome. The lesson however does not model any scientific process or involve the students in "doing" any hands on tasks, therefore the curricular competency outcomes cannot be met. For this to happen I would need to augment this specific learning resource, incorporating some different elements and student activities.

What are the Barriers that Exist?

The primary potential barriers that exist for students within my particular distance

and blended learning programs are:

- Reading challenges or learning disabilities

- Written output challenges

- Attention challenges

- Lack of sufficient background knowledge in this topic area or scientific

  methodology

- Advanced knowledge in some of this content area with potential gaps that impact

  overall understanding and skills

- Learning at a distance: feedback and questions response time may vary, access

  to materials varies, amount of adult support varies

These barriers are elements that I am keeping in mind as I analyze this science lesson,

looking for the three core principles of Universal Design for Learning; multiple means of

representation, engagement and action and expression.

Multiple Means of Representation, Engagement, Action and Expression

This lessons does contain several means of representation including written text,

a video, and images. One video however only contains text based slides with no audio.

The second video does include a song to help students remember the key words and

concepts. Within the written text descriptions of solutions, there are numerous

hyperlinked keywords that lead students to the appropriate sections with the CK-12

library of lesson resources when clicked. This clearly addresses the potential challenge

of students having varying levels of background knowledge on this topic. Students can use these links to clarify and build up their understanding of the key vocabulary and concepts as needed. Some students would also find this ability to click to other sections for more information to be quite engaging. Some however may be overwhelmed and find it challenging to return to the original lesson that they are supposed to be working through, particularly those who struggle with reading the content, including the page headers. The Real World Connection piece of this resource may also be an engaging elements for some students as it relates the content to real world practice, showing why this knowledge may actually be important.

Overall, the reading level of this resource would be challenging for many of my students as it is written to target students who are two to three grade levels higher. There are no alternate reading levels available nor audio recordings to go along with the text.

Some checks for understanding are included in this resource. There are review questions at the end of the text information page and there is also a practice section containing various questions for the students to try. This piece does require that the students create a free CK-12 account.

A key limitation of this particular lesson resource is that is does not require any active participation on the part of the students, meaning that this resource does not meet the core principle of UDL of including multiple means of action and expression, and it cannot be used without revision. Response to written questions is the only method of checking for understanding; there is no application piece to show the ability

to transfer the knowledge to new situations. The lack of demonstration of what the

students will learn and the lack of opportunities to for students to apply their learning are

major instructional design flaws that need to be remedied (Merill, 2008).

Steps Needed to Revise, Remix and Reuse This Resource

In order to use this resource with my students in either the face to face day

portion or the online course there are several revisions and additions that I would need

to make. These revisions include:

- Provision of explicit learning goals connected to the BC curricular outcomes

- Provision of a rubric identifying how learning will be assessed

- Provision of instructions for using a web based text reader such as Read and
  Write for Google Chrome or text at alternate reading levels

- Modelling of the application of the knowledge based outcome and how to do the
  curricular competency outcomes (support the skills development)

- Addition of a learning task requiring active participation to practice and
  demonstrate skill development

Copyright

Any discussion about the usability of an open educational resource wouldn't be

fully complete without looking at the copyright associated with the particular resource

given that the definition of "open" is variable (Roberts, Blomgren, Ishmael & Graham,

2018). All of the lessons and resources found on the CK-12 site, including this lesson on

solutions, have a Creative Commons license designation of CC BY-NC

(attribution-noncommercial), meaning that they can be reused, remixed, revised and

redistributed as long as the original source is credited and any new creations are

licensed under identical terms (Creative Commons, 2019). This means that although

this resources requires some revisions in order to fit the Universal Design for Learning

framework and best meet the learning needs of the students in the given contexts, it

does still hold value and is something that I will be able to work with.

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