Indian Education for All (IEFA) Implementation  
at Montana State University Northern

**OER project title**: Indirect teaching for students in the automotive technology field of study

**Presenter:** Kevin Ruby, MSUN Assistant Professor

**Type:** Hands on interactive activity

**Motivation:**

Every year I tend to see more students struggling with the fundamental concepts of electricity and as such I have been working hard to identify some learning objectives that students can achieve on their own time to help increase their success in this field of study. One way in which I am doing that is by making technology easily accessible to students to practice on their own so that a higher level of complex thinking can be achieved during class time. Upon completion of an electrical fundamentals activity book they will have an opportunity to present to me their achievement and I will then give them feedback so that they know how they ranked with these challenging tasks.

**IEFA:**

**Tharp Standard IV for Culturally Responsive Teaching -- Teaching Complex Thinking: Challenging students toward cognitive complexity. The teacher:**

1. Assures that the students, for each instructional topic, see the whole picture as a basis for the understanding the parts.
2. Presents challenging standards for student’s performance.
3. Designs instructional tasks that advance student understanding to more complex levels.
4. Assists students to accomplish more complex understanding by relating to their real-life experiences.
5. Gives clear, direct feedback about how student performance compares with the challenging standards

**Materials and technology involved:**

- A Circuit Scribe basic kit (available online), which includes five modules and a silver conductive ink pen  
- An activity book created for use with these modules  
  
See video and appended activity book for further information.

**Learning Objectives/targeted outcomes:**

* Identify and interpret electrical/electronic system concern; determine necessary action.
* Diagnose electrical/electronic integrity of a series, parallel, and series/parallel circuits using principles of electricity (Ohms Law).
* Create circuits and calculate resistance, amps or ohms using actual components.

After completion of the activity book students should have a solid foundation on the theory of electricity, giving them a better understanding of diagnosis and operation of circuits.

**Activity:**

This is an indirect teaching activity that is specifically directed towards automotive, ag, and diesel students. The activity is based on problem solving using sense making decisions and will be time generous rather than time prohibitive. The activity book includes topics like basic laws of electricity and how they relate to diagnosing common problems with lighting circuits and how to learn these basic laws through independent practice. The learning kit includes materials that students will purchase from the bookstore that will enable them to learn on their own pace competencies that then can be used to complete lab objectives while in the comfort of their own home. This kit has been created by a professional expert in the field of study using proven technology that’s also reasonably priced and allows for the professor to grade such work and provide essential feedback to the students to help increase a higher level of learning and involvement.

Please see video below for more details. <https://www.youtube.com/watch?v=-3ofgPZImfM&t=3s>

**Review and Revision:**

This phase will take place in the fall of 2017 where 57 students will be immersed into using this new technology to learn and complete lab objectives.