

Framework for Planning Experiential Science

Theory on the left, case study on the right. As presented at the Summer Institute in Santa Fe.

Overview

Kolb says that [to gain genuine knowledge from an experience](#),

- The learner must be willing to be actively involved in the experience;
- The learner must be able to reflect on the experience;
- The learner must possess and use analytical skills to conceptualize the experience; and
- The learner must possess decision making and problem solving skills in order to use the new ideas gained from the experience.

Apply [The Eight Principles of Good Practice for All Experiential Learning Activities](#)

Case Study: Photography

Show off my camera obscura at the start of class.

“We’re going to explore how images from by building several different types of imaging devices, including a working camera. Have you ever done this before?”

Teacher Talk:

I change my opinion often on “do I need to build (some version of) the project beforehand?” The benefit of having an example pre-built is that it’s easier to hook a majority of your kids. The drawback is that if you built it in advance, then the project can’t be that authentic, can it? Experiential ed doesn’t require authentic projects but I think they’re superior.

Concrete Experience

According to [Saul McLeod](#), this is “a new experience of situation is encountered, or a reinterpretation of existing experience.”

Be careful, though! Not all experiences are educative. You must choose activities that develop deeper understanding rather than be simply “fun” or “interesting”. Through careful planning and knowing your students, you should [avoid mis-educative experiences](#), which could limit future growth from experiences.

Case Study: Photography

1. Show a simple [camera obscura as built out of a paper towel tube](#).
2. Each student will build their own camera obscura with materials provided.
3. Go outside and check out the images you get by pointing the camera obscura at different objects. (Pro tip: you may want to bring along a dark jacket or blanket to darken the area around the viewing screen.)
4. Informally ask students “What do you notice? What do you wonder?” This bleeds over into the next stage of the Kolb Cycle which also includes questioning.

Based on my research, students are supposed to have a firm understanding of why they’re doing the experience.

Teacher-talk:

I chose the paper towel camera obscura over other options because it’s easy and yields immediate results. It also generates questions like “why”.

	When planning, I recommend you start with a concrete experience that's "low floor, high ceiling".
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Active Reflection

Reflection is the means by which a student [makes sense](#) of their experience. There are so many ways to reflect, including journals, portfolios, role plays, games, model construction, and discussion. Don't be afraid to modify outdoor ed reflection/debrief techniques to your classroom!

Reflection may be [focused on](#) the cognitive, affective, or process pieces of an activity. For example, a cognitive reflection prompt might be "Were the goals and objectives of the experiential activity accomplished?". An affective prompt might be "Has this experienced changed you?" Finally, a process prompt might be "Did anything surprise you?"

Some like [the 5 Questions model](#) for organizing reflection:

1. Did you notice...?
2. Why did that happen?
3. Does that happen in life?
4. Why does that happen?
5. How can you use that?

Case Study: Photography

While you build your first camera obscura, I'll ask you some version of these questions. After building, we'll hold a debrief to reflect on the experience. I'll choose the debrief type based on my reading of the room and my favorite methods.

Teacher-talk:

In my experience, these 5 Questions often flow naturally during the experience, especially as students build something. However, we also want to pause and do a [proper experiential-style reflection](#).

Also, I encourage you have your own [active reflection](#) regularly. My method is a daily blog that includes a picture and a brief reflection on the day's activity. Other teachers are doing the same and sharing on Twitter under [#teach180](#).

Abstract Conceptualization

According to [Saul McLeod](#), "reflection gives rise to a new idea, or a modification of an existing abstract concept."

You can conceptualize through lecture, experimentation (a form of further experience), solving problem sets, etc.

"As much as it is the responsibility of the instructor to allow students to take control of their own learning, there are teaching techniques that can enhance

Case Study: Photography

You're probably going to take some notes here, definitely going to work some calculations, and in the old school meaning of the word you'll "learn" something about the physics of image formation.

Teacher-talk:

While abstract conceptualization doesn't have to be a lecture, this is the spot where the lecture can go. The main difference between experiential and traditional ed is placement. In traditional schooling,

reflective and experiential learning” (see page 10 here): • Wait time • Confronting learners with their own misconceptions • Concept maps • Require learners to explain and apply • Questioning	we’d put lecture first, then go practice using those textbook skills in a lab or on a project.
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Active Experimentation

According to Saul McLeod, this is when “the learner applies them [abstract concepts] to the world around them to see what results.”	Case Study: Photography 1. Now that you understand the basics of image formation, let’s build a pinhole camera to capture photos. 2. Give a brief description of photo paper, film, and developing techniques. 3. Build a pinhole camera that uses photo paper. 4. Do an experiment with that camera. For instance, calculate your camera’s magnification. Teacher-talk: Warning! This next thing is hard and requires lots of advance planning. As much as possible, your experiential cycles should spiral upwards rather than be freestanding. Hard because it takes more time and you need to find a way to link experiences, often across units of study. Also, this fits in <i>perfectly</i> in a science class, don’t you think?
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Converting Traditional Learning to Experiential

Not starting from scratch but rather want to infuse experiential learning into your classroom? I found “[Best Practices in Experiential Learning](#)” to be helpful. I also liked the “Designing Classroom Activities” section of this [paper on best practices \(pp. 6-7\)](#).