

# Engineering Experiential Learning Experiences: Do, Reflect, Apply

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Learning by doing is an effective (and fun) way for young people to connect STEM concepts to real-world situations through hands-on experiences. The key is to start with an engaging experience followed by reflection and future application. Learn about the 10 steps to engineer an experiential learning experience for your students!

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*I hear and I forget. I see and I remember. I do and I understand.* Confucius, 450 BC

*Tell me and I forget. Teach me and I remember. Involve me and I will learn.* Benjamin Franklin, 1750

*There is an intimate and necessary relation between the process of actual experience and education.* John Dewey, 1938

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Experiential learning experiences are an authentic way to learn as they are inspired by real-world problems and can be shaped in a way that will reinforce critical thinking, creativity, collaboration, and communication – the 21<sup>st</sup> Century Skills.

**STEP ONE:** Set aside traditional classroom instructional practices. There is a time and place for everything. Though it may be challenging, to allow for the wonders of experiential learning to take hold you will need to avoid traditional means of instruction such as lecture, step-by-step instructions, seeking one correct answer, etc.

**STEP TWO:** Backwards design it! Start with the end in mind. What do you want learners to gain from this experience? Think of the big picture and clearly define the goal. This will be broader than learning objectives. Those can come later.

**STEP THREE:** Identify scenarios in the real-world where that big picture learning might take place. Narrow down your ideas to those that will be fun and engaging to a broad range of learners, while addressing your set learning goal(s). From your short list, choose the low hanging fruit. What idea will be most easily achieved? What idea do you have all or most of the needed resource for already? What idea connects to your local community and how might you engage your community in the activity? What idea can be supported by learners' past experiences and how might it support future experiences?

**STEP FOUR:** Keep it open! Open-ended experiences with limited boundaries can more easily allow learners to pull from their past experiences and connect to their own interests. Allow students to go down paths that you might not have expected.

**STEP FIVE:** Do not anticipate (or require) one right answer. The fewer direct instructions to given, the broader the range of solutions will be.

**STEP SIX:** Set appropriate limitations and make sure your expectations match the limitations and activity scenario. Be reasonable with expectations in relation to activity time. For example, you could provide the exact same activity for a 30-minute session and a 2-hour session. The solution provided for the 2-hour session should be more complete and thought out than those from the 30-minute session.

**STEP SEVEN:** Intentionally integrate opportunities (or requirements) for collaboration and communication. It can be subtle as to not offset learners that are socially reserved, such as asking groups of learners to showcase their solutions. Keep it low-key and age appropriate, building learners' confidence.

**STEP EIGHT:** Be a guide on the side, not a sage on the stage. It can be hard to let learners struggle, but that is where learning happens. Encourage learners to rely on one another to work through problems and resist the urge to overly prompt them through the process. Try answering questions with questions. Direct learners to helpful resources or ideas without telling them what to do.

**STEP NINE:** Reflection is vital, but does not need to be complicated. It can be as simple as a discussion allowing learners to share with each other what they experienced, what was important to them, and how those aspects of the experience could be applied to other experiences. You can also design a reflection activity. Keep in mind that both individual and group reflection are important and should be incorporated when appropriate.

**STEP TEN:** Just as it is for your learners, you will make mistakes and plans sometimes fail. Mistakes and failures are simply opportunities to learn and improve. Things will not be just right the first time. Be reflective in YOUR process and fine tune as you go. Do, reflect, and apply... the same theory holds true for how you learn.

**BONUS:** Use the Engineering Design Process as you develop your experiential learning experiences:

1. **ASK:** What is the problem/goal and what are the limitations?
2. **IMAGINE:** Brainstorm ideas! Select the "best" one.
3. **PLAN:** Outline the idea. Identify materials and steps. Get feedback from others.
4. **CREATE:** Bring the idea to life. Test it with learners.
5. **IMPROVE:** Identify what went well and what did not. What resonated with the learners? What can be improved? Repeat the process to continually refine the experience. Improvements can be impromptu or made during each iteration of the experience.

In addition to these ten steps, it is important to have a theoretical understanding of experiential learning design. Learn more at the resources below:



Northern Illinois University Center for Innovative Teaching and Learning. (2012). Experiential learning. In Instructional guide for university faculty and teaching assistants. Retrieved from <https://www.niu.edu/citl/resources/guides/instructional-guide>



The Learning & Teaching Office (n.d.). Best Practices in Experiential Learning. Retrieved from [https://www.mcgill.ca/elc/files/elc/doc\\_ryerson\\_bestpracticesryerson.pdf](https://www.mcgill.ca/elc/files/elc/doc_ryerson_bestpracticesryerson.pdf)

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