

Promising Practices In 4-H Science



4-H Science

March 2011

Experiential Learning: A Powerful Pedagogical Strategy for 4-H Science Educators

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The Connection between 4-H Science and Experiential Learning

An essential component of 4-H Science programs is the framing of activities around the experiential learning cycle. Experiential learning provides opportunities for participants to construct meaning through engaging experiences. According to research:

- The foundation of experiential learning lies in the learner's experience (Andresen, Boud, & Cohen, 2000). However, isolated experiences that lack opportunities for learners to reflect upon their new understanding and apply that knowledge to authentic situations do not necessarily ensure that learning has occurred (Dewey, 1938).
- The 4-H experience emphasizes "hands-on, learning-by-doing"; however, "hands-on" does not always translate to experiential learning (Enfield, 2001). Experiential learning must, by design and through implementation, include opportunities for reflection and application (Enfield, Schmitt-McQuitty, & Smith, 2007).



4-H Science programs create opportunities for extension educators to improve youths' knowledge, skills, and positive attitudes in science, engineering, and technology. By engaging youth in concrete experiences that are followed by reflection and application educators can help ensure deep learning.

Components of Experiential Learning

Concrete Experience: This is an opportunity to engage learners in an investigation through an activity of some kind (Enfield, 2001; Kolb, 1984), but is done with little or no help from the facilitator/teacher. However, the experience must include defined learning objectives.



For example, in the new National 4-H curriculum *There's No New Water!* (Smith, Worker & Kelly, 2010), youth engage in an experience that involves transferring varying amounts of water from several buckets representing water resources in urban and rural areas. The principal learning objective of activity is to have youth gain an understanding of similarities and differences between urban and rural water use and their impacts on water quality and availability.

Reflection: The reflection component of experiential learning involves the seamless movement through three distinct phases where by the teacher/facilitator guides the learners to share thoughts and feelings with others in order to process and generalize their experience (Enfield, 2001).

Following from the previous example, when youth are investigating the similarities and differences between urban and rural water use in the *There's No New Water!* curriculum, they compare water use in 2010 with the projected use in 2025.

Subsequently, the youth discuss ways in which different and increased uses of water might impact water quality and water conservation. The facilitator does not provide the answers, but help guide youth to the learning objectives through open-ended questions as they reflect upon their experience.

Application: Application follows the experience and reflection components of experiential learning and provides opportunities for learners to apply new knowledge to authentic situations in order to help deepen and extend their understanding (Carlson & Maxa, 1998).

A key means by which application is accomplished in the *There's No New Water!* curriculum is through the identification and implementation of service learning projects around water issues in the communities where 4-H youth live.

Cyclic: Another key point of emphasis is that the experiential learning process is a “recurring cycle” (Kolb, 1984). Learning gained through one experience builds upon itself and leads to new ideas, questions, and further experiences.

Although several published experiential learning cycles with diverse numbers of stages (three, four, or five) exist, the 5-step learning cycle is most commonly used in the 4-H Youth Development Program (Figure 1).

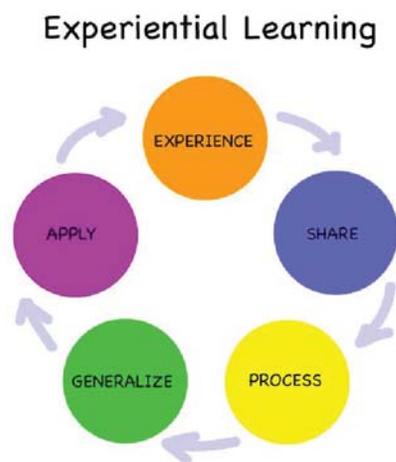


Figure 1. 5-Step Learning Cycle (UC-STEL, 2005).

Experiential Learning: Best Practices in 4-H Science

Experiential Learning in 4-H Science can take place in a variety of contexts, but always encompasses the essential components of a concrete experience, reflection, and application. Examples in published literature of how some extension educators have put this methodology into practice include:

- Hairston (2004) described engaging 4-H teens in community service activities that involved planning and implementing a meaningful experience and reflecting upon it.
- Smith and Enfield (2002) developed the “Step-Up” Incremental Training Model to train 4-H teens as teachers of science.
- Spiegel et al. (2005) described the adaptation of an existing curriculum in order to incorporate elements of experiential learning for 4-H.



Experiential Learning: Promising Practices in 4-H Science

4-H Youth Development professionals from Iowa State University, Oregon State University, the Ohio State University, the University of Minnesota, and the University of Nebraska were interviewed with the purpose of identifying practices used in 4-H Science that show promise related to the training and support needed to ensure the use of experiential learning in 4-H Science programming. Common themes include:

- Utilizing curricula that include the experiential learning cycle as the basis of the lesson plan design and automatically imbeds the use of the cycle into science lessons.
- Providing opportunities to model and practice questioning strategies that are open-ended.
- The use of face-to-face training paired with subsequent webinars to train staff and volunteers in experiential learning. This strategy allowed for multiple contact points with participants and information.
- Conducting on-site observations of staff and volunteers delivering 4-H Science programs. This allows for further coaching and identification of future training needs.



Resources and Tools for Experiential Learning

Websites

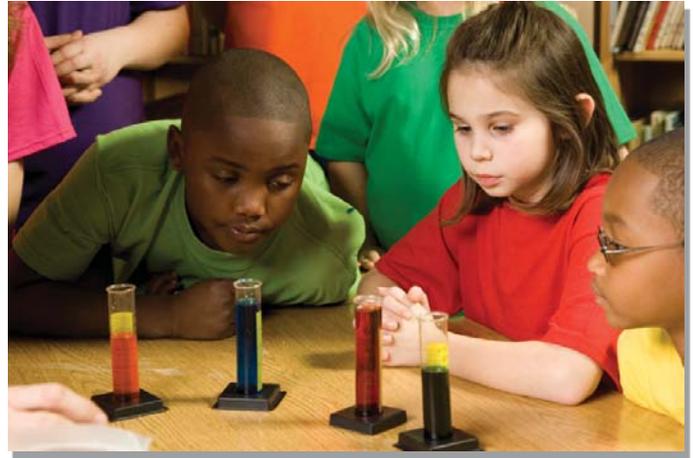
- UC Davis Experiential Learning website: <http://www.experientiallearning.ucdavis.edu> This site features pedagogical and theoretical information about experiential learning and provides tools, resources, and module outlines for use by other educators.
- David Kolb on Experiential Learning: <http://www.infed.org/biblio/b-explrn.htm> The author addresses possibilities and issues associated with David A. Kolb's model of experiential learning. Additional resources are provided for further reading.

Associations

- The Association for Experiential Education: <http://www.aee.org>
- International Consortium for Experiential Learning: <http://www.icel.org.uk/>
- National Society for Experiential Education: <http://www.nsee.org/>

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