Experiential Agricultural Literacy: Focus on Commodities Elementary School Curriculum

Kelly Gill
University of Illinois at Urbana-Champaign

Amy M. Leman
University of Illinois at Urbana-Champaign

Hannah Spangler
University of Illinois at Urbana-Champaign

Corresponding Author:
Dr. Amy M. Leman
139 Bevier Hall, 905 S. Goodwin Ave.
Urbana, IL 61801
bunselme@illinois.edu

Introduction/Need for Innovation or Idea

Miller et al. (2022) recommend that agriculture education should be improved to increase agricultural literacy in elementary students. In a study done by Hess and Trexler (2011) those students participating could name common foods in their raw form but could not name the agricultural crop that common products originate from. This demonstrates that students have a basic understanding of agricultural products but have no knowledge of products that originate from agricultural crops (Hess & Trexler, 2011). When people have knowledge of the agriculture industry, they are able to make informed decisions as consumers (Kovar & Ball, 2013). The Focus on Commodities curriculum contains lessons and activities to help students better understand what agricultural products make up commonly used items and the process in which they are made.

Experiential learning is a theory of learning in which students gain knowledge through direct interaction with the world (Kolb, 1984). Each of the activities in the Focus on Commodities curriculum is designed with this theory in mind. Within each section of the curriculum, there are times for students to take an opportunity to reflect on their learning. Experiential learning that includes relevant reflection can lead to increases in self-efficacy and students' voices, in addition to increases in academic knowledge (Gartland, 2021).

How it Works/Methodology/Program Phase/Stages

Four schools and seven 4-H clubs in Illinois were recruited to participate in the Focus on Commodities project beginning in the fall of 2021. The teachers or 4-H leaders participated in a two-hour training in which they learned about the delivery of the activities in the curriculum and received the materials they needed to lead the six-session program. The participants were divided into three groups. The first group received instructions and participant workbooks that had pages for participants' written reflections after each lesson. The reflection questions allowed participants to think about what they learned from the lesson, how they might apply that information to other areas of their lives, and what questions they still had about the topic. The second group received a curriculum that gave the instructor a set of questions to verbally ask the participants at the end of the lesson, allowing participants to raise their hands to answer the questions. The third group received no reflection questions, just the activities.

In the original design, the same number of schools and participants were in each group. However, starting with the training in the fall of 2021, we ran into consistent problems related to the COVID pandemic. The first two training dates for teachers had to be rescheduled due to COVID-related closures and procedure changes. 4-H clubs faced similar issues, canceling meetings and rescheduling events. Therefore, only 2 schools and 3 4-H clubs completed all six lessons of the curriculum. This curriculum was created for an elementary-aged audience in Illinois, piloted with classes and 4-H clubs in areas characterized as rural or quasi-suburban. It will need to be adapted to use in other states.

Results to Date/Implications

Multiple Choice Responses

Participants received the same learning check at the end of their program. The results of the multiple choice questions were tallied for correct answers and the applied questions asking participants to list items or give short answers were compared to their beginning answers for accuracy. Table 1 below illustrates the percentage of participants that answered the question correctly on the before and after program learning checks. In many areas, it showed growth in knowledge after learning information in the program.

The only question that showed a decrease in knowledge related to growing pumpkins on a sandy beach. While the question was meant to say that pumpkins prefer sandy soil, the question may have been confusing to the participants after spending time creating an ecosystem for their pumpkins involving more than just sand.

Table 1

Pre and Post Test Learning Check Correct Answer Responses

Learning Check Questions	Pre-Program Answer % Correct Response (*n*=44)	Post-Program Answer % Correct Response (*n*=35)	Change in Response
Is field corn the same as corn on the cob	55%	83%	+28
Field corn grown in Illinois is in products all over the world	57%	77%	+20
Types of soil	5%	54%	+45
Factors important for planting pumpkins	61%	77%	+16
Pumpkins grow well on a sandy beach	100%	89%	-11
Parts of the ruminant digestive system	43%	86%	+43
Ruminant animals	64%	80%	+16
Cow and non-ruminant stomachs differences	25%	71%	+46
How food is converted into energy	30%	69%	+39

Knowledge Application

For each section of the learning check, there is one knowledge application question. In the section of the program about corn by-products, participants were asked to list as many products as possible that humans use on a daily basis that contain field corn. Compared to the pre-program learning check, in the post-program learning check learners were able to include many more products and products without corn in the name. In response to the sections related to pumpkins, participants were asked to list factors that people should consider when planting a crop that is not pumpkins. The before and after program learning check produced similar answers of water, soil, and seeds. Additional factors added to the after-program learning check were sunlight, time of year, and seed spacing. To attempt to apply knowledge related to animal science, participants were asked what an animal's diet can tell us about the structure and function of the animal's digestive system. On the post-program learning check, participants were able to explain their answers using key terms taught in the program in order to get to the correct answer.

Future Plans/Advice to Others

The Focus on Commodities program is currently available for use by the Illinois Ag in the Classroom staff and will be posted publicly after the official 4-H review.

Costs/Resources Needed

Within each lesson, there is a list of supplies needed for the activities. Many of the activities require supplies that can be found in a classroom such as markers, scissors, paper, flip chart paper, etc. Beyond classroom items, some additional supplies will need to be acquired such as soil, pumpkin seeds, packing peanuts, etc. which are listed in the lesson plan. As a note, the original lesson on soil relates to Illinois soil comparisons, which will need to be adapted to fit other states.

References

Gartland, S. (2021). Exploring elementary student perceptions of experiential learning within critical service-learning. *Journal of Experiential Education, 44*(1), 50-64. https://doi.org/10.1177/1053825920980786

Hess, A. J. & Trexler, C. J. (2011). A qualitative study of agricultural literacy in urban youth: What do elementary students understand about the agri-food system? *Journal of Agricultural Education, 52*(4), 1-12. https://doi.org/10.5032/jae.2011.04001

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development, 1st ed.* Prentice Hall Publishing.

Kovar, K. A. & Ball, A. L. (2013). Two decades of agricultural literacy research: A synthesis of the literature. *Journal of Agricultural Education, 54*(1), 167-178. https://doi.org/10.5032/jae.2013.01167

Miller, A., Warnick, B., Spielmaker, D. (2022). A case study: Agricultural literacy proficiency in an Iowa elementary school. *Journal of Agricultural Education, 63*(4), 220-231. https://doi.org/10.5032/jae.2022.04220