Urban Agriculture: An Agriculture Course that Assess Learning Through Experience

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Introduction

Summative assessment is criticized for its fairness and relevance in today's educational system (Road, 1998). Theorists like John Dewey (1938), David Kolb (1984), and T. G. Roberts (2006) argue that learning happens through experiential learning and includes elements of assessment and feedback. Experiential learning is a four-part process that requires the learner to have a concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984). Hand in hand with experiential learning is the concept of project-based learning (Dewey, 1938; Doppelt & Barak, 2002). With the theoretical groundwork laid, the researcher created an innovative course that combines Dewey's (1938) learning by doing and Kolb's (1984) experiential learning model by removing most summative written tests and replacing them with urban agriculture projects.

The researcher was a school-based agriculture educator (SBAE) at Green Canyon High School in North Logan, Utah. This course was created due to the wide range of student experience found within the geographic school boundaries. Most of the classes within the agriculture program featured 30% of students who had some experience with agriculture, 60% of students with an interest in agriculture but very little experience, and 10% of students who had little to no interest in the class but were placed there by the school counselors. Due to the range in student skill the researcher designed a course that taught skills to enable rural or suburban students to incorporate agriculture into their lives regardless of their living situation.

How it Works

The course was created to meet the needs of junior and senior agriculture students in secondary-based agriculture education who do not have access to large plots of land or facilities for animals but desired to participate and learn about agriculture. The course units ranged from aquaculture, vertical gardens, raising a homegrown protein on less than an acre, human nutrition, beekeeping, and innovations in agriculture. The class was set up to have a twenty-minute educational component where the teacher would teach class curricula or give additional instructions as needed and students could present knowledge learned from working on their projects. After the twenty-minute instructions, students were released to work on their projects. Students broke into groups and were assigned various tasks each day. Changing groups was allowed, but the student had to get approval from the teacher. Each group had at least one major project to create: homemade turkey tractors, two-hundred-and-fifty-gallon aquaculture systems, producing a given amount of lettuce grown in the aquaculture tank, etc. The teacher would assign a team leader every three weeks and meet with them regularly throughout the week to supervise progress. Teams developed project calendars and materials for each project. All projects were sold as a fundraiser for the class budget.

Teacher responsibilities vary day to day. Important to the engagement of students was the teacher continually sharing their attention with each of the groups as often as possible. Students were given a pre, middle, and post content knowledge assessment to measure student understanding throughout the semester. Guest lecturers were brought in bi-monthly to add additional experience and advice on the projects being worked on. Daily and weekly reflection became an important part of the course as the students reviewed the work they had done and identified lessons learned. Adjustments were made as necessary when students experimented with novelty techniques designed by them, in response to challenges that their projects often created. Which supports findings by Dewey (1938) of how students learn and adapt their knowledge due to hands on or project based learning.

Results to Date

The most dramatic result happened from year one to year two when the original class of fourteen grew to a class of thirty-four students. Students were excited about the course and the projects because they were a part of the decision-making process and because there were no step-by-step manuals for them to use. Students were forced to work as a team to problem solve, experiment, and test their ideas. This challenged them in different ways, and evidence of learning was shown as they created presentations about their work on their projects. As previously mentioned, the teacher administered a pre, middle, and post-test in the class and growth was seen in all but three students. Fundraising from projects sold into the community covered all project expenses and covered the occasional food reward for hard work in the class. Students in the first trial of the course often commented how they enjoyed what they were learning and that they had the freedom to experiment and fail without the fear of failing the class. It is important to note the second year this course was given halfway through it was prematurely shut down due to the Covid-19 pandemic. All course work was moved online greatly hindering the overall objectives of the course.

Future Plans/Advice to Others

Future plans for this course are to create a four-year rotating schedule of projects so that students are given a new project to work on and stay engaged each year. Students in the first-year class already designed and participated in most projects, so their excitement dwindled as the year continued. Advice to others would entail making the class a capstone course in an agriculture program. That way, only advanced juniors or seniors can participate, reducing the risk of a younger classman getting injured. Another bit of advice would be to hold regular weekly meetings with the group leaders to ensure progress and to stay on top of material ordering. Finally, be sure to grade on participation and take attendance both at the beginning of class and at the end to ensure that students have not snuck off during work time. Don’t be afraid to create projects on any budget. If you do not have a good funding source, start small and then build up over time. There are plenty of easy cheap projects that students could quickly get behind and problem solve.

Costs/Resources Needed

Laboratory space for students to work is a necessity. Students need to have room to cut things safely, build structures, and have a flow of fresh air. Projects can vary in cost and can adapt to each program’s budget. The researcher spent anywhere between ten to two hundred and fifty dollars, depending on the project. The money will be recuperated by selling the projects, usually deposited into the class budget. Another cost for the teachers is their time in course creation. This is not a course that you can arrive on the day of and wing it. The teacher must coordinate time in developing project ideas, group assignments, and materials available before beginning the course.

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