Innovative Idea

Increasing On-Task Work Time by Implementing a Low Stakes Competition Based Auxiliary Project

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Introduction/Need for Idea

The agricultural systems laboratory proves to be a diverse learning environment as it can house projects that vary in difficulty, technique, and duration (McKim & Saucier, 2011). Although project based learning has proven to be very beneficial to students in agricultural education (Toombs et al., 2022), project completion rates can influence student productivity and consequently, the overall learning environment (McKim & Saucier, 2011). A multitude of factors in the laboratory setting can affect student productivity. In rural schools or small agricultural systems laboratories, these factors may be particularly limiting due to constraints in resources and equipment (McCubbins et al., 2016). When provided with self-directed projects, students have the potential to distract themselves or their peers, highlighting the importance of maximizing on-task worktime (Myers et al., 2005; Friedel & Anderson, 2017).

Agricultural mechanics laboratories often have periods of downtime as students work with limited tools and equipment to complete similar tasks. This requires implementing instructional structures to maximize on-task behavior (Phipps, et al., 2008). Maximizing on task time can not only lead to better learning outcomes, but could also prevent horseplay in dangerous settings and injury (Phipps, et al., 2008; McKim & Velez, 2016).

Low-stakes competition refers to structured instructional competitive activities in which performance outcomes are incentivized and support practice and formative learning (Ames, 1992). Such competition can increase behavioral engagement, participation, and effort because the perceived risk of failure is reduced and the focus remains on improvement rather than ranking (Ames, 1992; Fredricks, Blumenfeld, & Paris, 2004). Research on formative assessment and classroom engagement further indicates that low-stakes, high-response structures are associated with greater on-task behavior and reduced disengagement compared to passive instructional formats (Reeve, 2012).

How It Works

This project was completed with students in an introductory agricultural education course $N = 11$. An initial survey indicated that 90.9% of learners preferred some type of competition or game-based learning. We then created two parallel projects, a primary project with standards-based skills and an auxiliary low-stakes competitive project. Students were informed they would need to complete two assignments in the upcoming unit, both projects were outlined, and students determined prizes for the auxiliary project.

The project was a basic wall mounted shelf that students enhanced with hand forged decorative brackets and hooks and was evaluated using a rubric. Limited resources for forging led to downtime at this portion of the project. During downtime, students were encouraged to work on the auxiliary project. The auxiliary project was creation of a flying wooden toy (puddle jumper). The guide contained steps to direct them through the processes of assembling a puddle jumper, but not exact measurements or instructions. This encouraged student creativity, problem solving, and critical thinking.

During student-directed worktime, pupils were allowed to manage their own schedule in order to complete both projects. To curtail students from predominantly working on their auxiliary project and/or reducing their focus on the primary project, students were not allowed to compete in the puddle jumper flight contest unless they had completed the skills-based project with a grade of a B or higher. The competitive event occurred on the date after the skills-based project was due. The student whose puddle jumper stayed airborne longest (as outlined in the guide) won a small prize that was proposed and voted on by the class.

Results to Date/Implications

All students in the course completed both the primary and auxiliary projects. Compared to previous and subsequent projects, students had notably less time off task when working on parallel projects. The instructor noted very little downtime and increased engagement by students, with several of the most off-task students engaging with the primary project solely so they could compete in the puddle jumper competition. Because the puddle jumpers took a trial and error process, students kept themselves well maintained, and focused even if they had finished their primary project prior to the due date. Giving students additional work was beneficial to the flow of work to be completed in this course.

Future Plans/Advice to Others

We highly recommend teaching in the agricultural mechanics laboratory with parallel projects and including low-stakes competitive projects. Our plan is to formalize this idea as an experimental design to provide the opportunity to gather empirical data for off-task behavior when a control group is implemented. Our advice is to note that the auxiliary project guidelines should allow critical thinking, problem solving, and creativity to harness student focus. If replicating this project, we recommend implementing an auxiliary project that allows for trial and error as this will keep students occupied and engaged for a much longer period of time than a project in which you follow directions step by step. We recommend

Costs/Resources Needed

Using parallel projects in the laboratory environment was very easy to implement. This project was designed to utilize the surplus of wood scraps present. Simple auxiliary projects can be developed based upon the materials available. Little to no monetary cost is possible. There is increased instructional planning in order to have two projects, along with the materials, guidelines, and tools ready in tandem.

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