Learning by Doing: Flipped Lessons in the High School Agriculture Classroom

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**Introduction**

In a traditional high school classroom setting, teachers often lecture to students and have them practice what they have learned at home in the form of homework. Before the following class, the students and teacher may review the previous night’s homework, but then continue on to the next lesson. “Flipping” a classroom involves reversing that process by having students first learn about a topic outside of class and then use class time to further explore the topic (Brame, 2013). Considering Bloom’s revised taxonomy (2001), and the teaching/learning process, “flipping” allows students to undertake lower levels of cognitive work (i.e., knowledge and comprehension) outside the classroom, and focus on the higher forms of cognitive work (i.e., application, analysis, synthesis, and/or evaluation) in class (Brame, 2013).

The Flipped Learning Model involves appropriate content-based lessons to be delivered outside of the traditional classroom using video, PowerPoint, or other modes of delivery. Class time, then, is available for students to engage in hands-on learning, collaborate with their peers, and participate in individualized learning and for teachers to provide one-on-one assistance and facilitate learning (Hamden, McKnight, McKnight, & Arfstrom, 2013). “This process allows students to move from being the product of teaching to the center of learning, where they are actively involved in knowledge formation through opportunities to participate in and evaluate their learning in a manner that is personally meaningful” (Hamden, et al., 2013, p. 5). Flipped lessons allow students to progress at their own rate, quickly moving through content they already understand or stopping to review content they missed the first time the material was presented. Online lectures can also easily incorporate visual representations, such as interactive graphs, videos, or photos to assist in a deeper understanding and provide differentiation in learning. (Goodwin & Miller, 2013).

Flipped lessons result is redefined classroom time that can look different across different grade levels and subject matter. One example is a high school animal science class. When planning an anatomy and physiology unit, creating flipped lessons using video content, PowerPoint, and note taking for homework, allows time for a brief discussion and clarification of material in class, and ultimately provides the greatest amount of time for dissection or other activities, where students can demonstrate their learning, ask questions, engage in discussion, and maximize their learning. This also allows students to take ownership of their learning situation and apply it using what they learned at home (Conner, et al., 2014).

A specific example of a lesson that benefited from flipped learning was the study of the reproductive system of cattle in an animal science course. The factual concepts (i.e., vocabulary) could be taught online through the use of video resources. This allows for increased time in class to evaluate, analyze, and dissect cow reproductive tracts, using the terminology and knowledge gained from the online lesson(s), thus allowing the learning to be student centered and utilizing the teacher as the facilitator.

At Lake Norman High School in North Carolina, 86 agriculture students engaged in a “flipped lesson” related to cow reproductive tracts. Following the lesson, the students expressed support for the way in which the lesson was presented. Students noted in a brief survey that they felt prepared for their hands-on activity through watching a video on cow reproductive tracts as well as defining specific terms at home, and then applying their knowledge to the actual dissection in class. They also felt that if the lesson had not been flipped, they would have had significantly less time to explore the cow tract during class. The students enjoyed a new way of learning, and for the purposes of this activity, the flipped lesson was successful.

**Implications**

“Flipped lessons allow learning to move away from teacher-centered activities where communication occurs from teacher to student, typically in one direction, toward student-centered learning in which inquiry and individualized application have a strong base in individualized experiences of the learners and activities are controlled by the student while the teacher acts as a facilitator or supporter of the learning process” (Conner et al., p. 68). “The student's traditional role is that of a passive note-taker and regurgitator of factual information. What is urgently needed is an educational program in which students become interested in actively knowing, rather than passively believing” (Michael, 2006, p. 159). Given the limited quantitative research on the study of flipped learning, specifically within high school agricultural courses, flipped learning is still an innovative concept with room for improvement and study.

**Future Plans**

Future plans include choosing lessons within agricultural courses where students could benefit from flipped learning, and collecting quantitative and qualitative data related to student perceptions of the flipped lessons, and gathering comparative data using flipped lessons vs. traditional instruction. Ultimately, more data is needed to confirm or refute the use of flipped lessons in the agricultural classroom.

**Resources Needed**

Computer and Internet access are critical resources related to the utilization of the Flipped Learning Model given that students must be provided learning materials outside of class beyond mere textbook readings. Additional resources include a means to create and post instructional materials associated with the in-class interactive learning components of the instruction.

**References**

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