



## Team-Based Learning: A Professional Development Model for Training the Trainer

### Introduction

In secondary agricultural education, in-service training offers an essential component to maintaining teachers' proficiency beyond their initial certification (Abolaji and Reneau, 1988). Applying problem-based learning, creating lessons that develop higher order thinking skills, and developing teamwork and collaboration among students were among the top areas of in-service needs identified by North Carolina teachers (Davis and Jayaratne, 2015). Team-Based Learning (TBL) utilizes group work through the vast majority of class time (Michaelsen and Sweet, 2008). Group cohesiveness developed through TBL is one of the key principles driving TBL's success in classrooms (Michaelsen et al., 2002). By applying TBL strategies to professional development, participants are not only exposed to new, field appropriate content, but are able to experience firsthand how they can incorporate an interactive and analytical teaching strategy into their classroom (McMahon, 2010). Utilizing TBL situations that require students to assume an active role in the learning environment not only aids students in mastering new content (Michaelsen and Sweet, 2014), but can also give educators participating in professional development events an opportunity to practice teaching their new knowledge.

Our institution hosts professional development workshops focusing on agricultural mechanics topics one Saturday (8:00 am-4:00 pm) per month during the school year. The workshops are open to both secondary agricultural education and industrial technology teachers. We offer graduate credit and continuing education credit options for renewal of their teaching licensure. Due to the popularity of our workshops, we draw a wide range of participants with varying levels of knowledge and skills. In order to maintain a high level of engagement for all participants, the presenters utilized TBL to design and implement the workshops.

### How it Works

The instructors sent the participants a short pre-reading on the primary content area. The participants then completed an Individual Readiness Assurance Test (IRAT) and Team Readiness Assurance Test (TRAT) at the beginning of the workshop. Based on the results of both the IRAT and TRAT, a short clarifying lecture immediately followed. Upon completion of the clarifying lecture, the participants (remaining seated in their teams) transitioned into the application exercise. In this case, they were learning how to design a nameplate using Computer Aided Design (CAD) software. Once the participants received training on the CAD software, the first application exercise required them to become instructors and work together in their teams to coach a student through the design process. In this case, we used graduate students to serve as the "students". The "students" acted as though they had never used the CAD software before and needed very detailed instruction to properly design the nameplate. Teams used the notes and experience they gained from the initial instruction to strengthen their familiarity with the CAD software during the mock teaching application exercise. Following this activity, the participants were tasked with designing individual fire pits on the CAD software, with the aid of their teammates and the workshop facilitators. The role of the professional development facilitator was to lead a discussion on projects, applications, and teaching methods.

**Table 1.** Steps designed to implement TBL into professional development workshops

Step	Activity	Description
Step 1	Distribute pre-reading	Pre-readings focusing on the workshop content are emailed to participants to prepare them with basic content knowledge.
Step 2	Participants complete IRAT	IRATs are given to assess individual knowledge gained from personal experience and the pre-reading.
Step 3	Teams complete TRAT	Teams meet to discuss the answers of the TRAT. This discussion places students in the role of the teacher and requires them to discuss effectively to determine correct answers.
Step 4	Follow up lecture	The instructors evaluate the immediate results of the IRATs and TRATs to identify content knowledge gaps. A short lecture covering only those knowledge gaps follows.
Step 5	Application activity	The main activity for the workshop is designed for groups to work together using their knowledge to complete an activity related to the content.

### Results to Date

The teachers had no prior knowledge of TBL before participating in this workshop. Anecdotally, the teachers were highly engaged during the IRAT and TRAT that lead to quality discussion. The workshop participants were so enthusiastic about TBL, 45 minutes of discussion revolved around answering questions regarding TBL. All of the teachers enrolled in the workshop requested additional information on TBL and continued to ask questions about TBL throughout the day. The facilitators also noted that the teams generated impactful discussion on how to use the software, applications and activities that can be implemented with the software and multiple teaching methods that can be utilized to deliver the content.

In past workshops, the instructors found it was difficult to keep the teachers who possessed more knowledge and skills engaged in the content than their peers. Conversely, we struggled to keep the teachers with little to no knowledge progressing through the content without feeling overwhelmed due to the knowledge gap. Using TBL as a model for training teachers, we were able to spread the varying knowledge and skill levels evenly across teams, where the teachers were able to work as a team through the learning process.

### Future Plans/ Advice to Others

For future workshops, we would like to collect a short survey from the participants that rate their experience levels. Creating diverse groups helps bring different perspectives to the team, bringing out greater team success (Michaelsen and Sweet, 2008). In short, one-day workshops, it is beneficial to keep team sizes small, approximately four to five participants per team, to help accelerate team cohesiveness.

### References

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