



Team-Based Learning (TBL): New instructional strategy for apparel product development

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## Introduction

Team-Based Learning (TBL) is an innovative instructional strategy used in many academic disciplines, including medical sciences, business, and education. With roots in small group theory, TBL provides students with the opportunity to put into action course objectives. In the TBL process, the roles of the students and instructor shift. That is, the student's role shifts from being a passive recipient of information to becoming a responsible learner of the course concepts, while the instructor's role shifts from being an expert to designing and managing the team process (Lane, 2008; Michaelsen & Sweet, 2008). In the field of textiles and apparel, literature about using TBL in the classroom is non-existent, though teams of students commonly work together on projects. Given that, the purpose of this study is to examine the effectiveness of TBL in the field of textiles and apparel.

TBL is a clearly-defined process that consists of five key elements: team composition, accountability, peer assessment, feedback, and assignment design (Michaelsen & Sweet, 2008). The creation of teams is a very important first step in TBL. The instructor must ensure that each group has access to adequate resources and the same level of resources across groups. As for accountability, TBL requires that all students are accountable to both the instructor and their teammates. In order to track the team's progress, at least two assessments in a semester are suggested. Students must receive immediate feedback from the instructor in order to quickly and effectively gain new skills and improve the quality of their work. The final foundation of TBL stresses the importance of assignment design. Each assignment given to students should promote learning and team development, and should be managed through team interaction.

## Innovative TBL Course Design

The course selected for this study is an apparel product development course in a public four-year university, located in the Midwest region of the U.S. This particular course was selected because it involved a semester-long team project, and team members reported numerous conflicts. The annual course enrollment was 50 and the course was taught by two instructors: a head instructor and a graduate teaching assistant. The course consisted of a 50-minute lecture and two 2-hour labs each week. The targeted students were upper-level design and merchandising majors.

With the intention of setting clear goals, the course objectives on the syllabus were revisited. The three major objectives were: 1) understanding core concepts of product development, 2) integration of the concepts into industry-driven team projects, and 3) development of marketable products through the research-based product development process. In order to achieve the first course objective, two sets of Readiness Assurance Process (RAP) tests -- an individual test (called i-RAP) and a team test (called t-RAP) -- were devised to



maximize in-class time with the teams. Students were required to read preparatory materials in advance and to provide a weight-grading system to individual students within a team. Seven i-RAPs, i.e., short quizzes that cover core contents in the preparatory readings, measured the readiness of individual students. The individual test grades contributed to the individual grade system. After the individual test, the students re-took the same quiz as a team (t-RAP). The point of the team test is to encourage peer-learning, where each team member helps ensure that everyone on the team understand important concepts. The team scores contributed to the team performance scores. After the RAP tests, the head instructor offered a short lecture to clarify misunderstandings of core concepts or reinforce the significance of the readings. This process covered the lecture session.

Course objectives 2 & 3 were exercised mainly in lab sessions. Based on a personality test and academic/professional backgrounds (CAD skills, GPAs, internship experiences), 11 teams were formed by the instructors. Pre-existing student relationships were avoided in team formation because it could interfere with the development of group cohesiveness. Immediately after team formation, the students were introduced to a product development project, sponsored by an apparel manufacturing company, located within 30 miles. This project was executed throughout the entire semester via the five stages of the product development process: market research, concept development, technical design, specification/costing, and final line presentation. Five units of course assignments were carefully designed to encourage high-level thinking, by posing challenging questions, and the students were given immediate feedback. Three separate peer assessments allowed the students to communicate with the instructors about team performance and accountability.

The peer evaluation results showed that a collaborative team environment was likely to yield better final team performance than the teams with unresolved conflicts. The team collaboration behavior was a more important factor for team success than individual GPAs. That is, students with a higher GPA were not guaranteed to receive better grades in the team environment. There was resistance to the TBL format in the beginning of the semester, but it faded away as the semester moved along. This project required not only student collaboration within a team, but also strong mutual agreement on the long-term partnership between academia and industry. Such synergistic relationships brought positive results on the both sides.

### **Conclusion and Discussion**

The results of this project identified positive impacts of TBL on the apparel product development course. Through this process, students learned how to successfully execute and manage a project as active members, but also how to resolve conflicts or issues that are commonly found in real work settings.

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