Innovative

Understanding the Impacts of Psychological Safety and Learning Behaviors in Remote Team Projects

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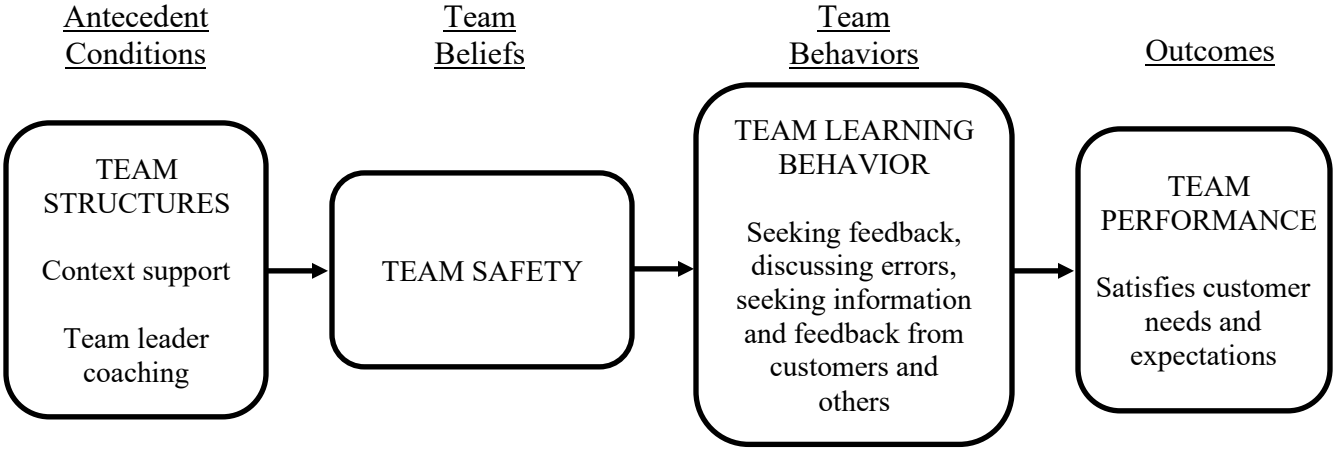
Introduction

Distance learning opportunities are increasing in popularity as students seek flexibility and convenience to achieve their educational goals (Allen & Seaman, 2017; Burns, 2023). It provides students with the ability to attend a program from anywhere and, in the case of asynchronous delivery, at any time. For some, this is access to education that they would not have been afforded in a traditional, residential program. This type of flexibility allows students to balance their education with their personal and professional commitments. While improvements and advancements in digital learning tools and internet connectivity have increased the adoption of distance learning, it is not without its challenges. The very nature of distance learning creates isolation for students and can negatively affect their psychological well-being (Burns, 2023). Indicators can include feelings of isolation, anxiousness, and uncertainty in content and peer engagement (Alomyan, 2021; Burns, 2023). For instructors, student engagement and learning assessment can feel limiting (Alamri, 2023). Learning management system-based quizzes and assessments have long been the standard. More recently, the integration of interactive quizzes, video discussion platforms, and other interactive tools have added interest and variation to online learning assessment, but they remain predominately focused on the individual learner.

Team projects are a common learning and assessment tool used in higher education and have often been used to facilitate project- and inquiry-based learning (Greenhaw et al., 2025) and teach peer engagement strategies (Greenhaw et al., 2025; Lamm et al., 2014). Well-designed projects can help students apply course content to a real-world situation and build team learning behaviors desired in today's workforce (Greenhaw et al., 2025). Team learning behaviors, as discussed by Edmondson (1999), is "an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions" (p. 353). Team projects are a hallmark of face-to-face learning assessment. However, the increases in distance learning and improvements in the typical distance learning tools and assessments have left many educators questioning if team projects are a feasible option and if students would benefit.

Edmondson (1999) outlined a model of work-team learning (Figure 1).



This model, though developed in the workplace context, is applicable to team projects in education. Edmondson (1999) specifically notes that "although the utility of learning behavior

may vary across types of teams, the association between team psychological safety and team learning behavior should apply across different team types" (p. 357). This is based on the core social psychological mechanism of work teams. People must take action in the presence of others and there in that action, there is the prominence of interpersonal threat (Edmondson, 2019).

How it Works and Results to Date

Faculty from Michigan State University, Oregon State University, University of Georgia, and Auburn University were granted a USDA-NIFA-AFRI-Education and Workforce Development grant in the Research and Extension Experiences for Undergraduates program area. The five-year program was launched in the fall of 2024. The goal of the program is to equip a total of five cohorts of 12 undergraduate students ($N = 60$) from across the country with research, data analysis, and decision-making skills in the food and agriculture industry through the implementation of geographically dispersed team projects.

In the program, students attend three online synchronous lectures introducing them to research, Extension, and academic associations, and three industry panels. Participating students from each university are divided into four teams based on interest, not location. Each geographically dispersed team is led by a mentor from one of the aforementioned institutions. Teams work on an identified research or extension project for the duration of the grant-year and present their work at a national conference each summer.

At the end of each cohort, participating students and mentors complete an end-of-program questionnaire containing items from the Team Learning and Psychological Safety Tool to measure each of the constructs outlined in the model of work-team learning. The reliability, validity, and factor structure of the measure have been established (Edmondson, 1999). The items were placed in an online survey platform and are distributed to the students and mentors at the end of the year. No identifying information is collected to protect confidentiality. A reminder email is sent one week after the initial distribution, and a final reminder is sent one week after the initial reminder. The data are analyzed using SPSS. A longitudinal questionnaire is designed to understand the qualitative impacts of the program on participants' educational and career goals, the impact of the mentor, and the overall value of the program for three consecutive years after their experience. Similar distribution protocols will be used.

Year one of the program is complete and year two is in progress. Preliminary results from students and mentors indicate that, overall, students had good team structures and dynamics and met expected outcomes, however, there is room for improvement in both. Descriptive statistics and inferential statistics will be calculated at the end of the program.

Resources Needed and Advice to Others

Minimal resources are needed. Existing learning management and data collection systems are used. Faculty time and effort are required to develop presentations, which can be reused each year (two hours per faculty), to coordinate and lead industry panels (five hours total faculty time), and mentor student projects (10-15 hours per faculty).

The goal of this effort is to understand the role of team structures and psychological safety (dynamics) on team learning behaviors and team performance in a geographically dispersed team project. From the year one experience, our advice to faculty is rooted in communication. Direct, frequent communication improved student engagement and reduced their anxiousness about the project and related expectations and timelines. Distance learning is increasing, and finding ways to engage students with the content and with each other will build desirable skills as they enter the modern workforce.

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