Incorporating Virtual Multi-University Collaboration and Human-Centered Design in an Agricultural Program Development Course

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Introduction and Need for Strategy

In order to provide new skills related to virtual teams and a unique experience for students during a time that travel was not authorized, the University of Illinois and University of Missouri developed an innovative approach to adding virtual teamwork through an agricultural education and training program development course taught during the pandemic. The two universities' instructors joint-taught their spring 2021 courses, bringing students together in virtual teams. Not only did the joint venture provide students with an opportunity to work virtually with individuals outside of their home university, but it also included applied learning through real world projects from stakeholder organizations. Additionally, the course content included human-centered design principles applied to traditional models of education and program planning.

Connection to Literature

The impact of integrating real-world experiences into the classroom has been well documented. Students given the opportunity to apply theories and concepts to practical problems are more likely to report higher academic motivation (Trolian & Jach, 2020). Actively engaging with course concepts leads to greater mastery of the material (Maskiwicz, et al., 2012) and skills in higher order thinking (Jensen & Lawson, 2011).

Human centered design (HCD), or design thinking, is a term for innovating or designing with the end user in mind. While there are many definitions for HCD (Brown, 2009, Krippendorff, 2006), this project uses the definition and model developed specifically for training and development (Boller & Fletcher, 2019). HCD is a problem-solving approach that involves working with target audiences to understand their needs/experience, synthesizing this information, ideating potential solutions, prototyping and implementing. HCD principles complement theories of teaching and learning that underlie university agricultural education programs. Research suggests that utilizing HCD principles should help students learn to shift their frame of reference becoming more empathetic, collaborating in meaningful ways and appreciating the need to adapt their point of view (Goldman & Zeilezinski, 2016).

How it Works/Implementation of Strategy

The goals for the agricultural education and training program development courses were to (1) expand the traditional vision of a classroom to include stakeholder projects with real world application, (2) connect students with neighboring institution peers through virtual collaboration, and (3) expand the frameworks for planning and training to incorporate HDC.

Before the courses began, instructors identified stakeholders interested in providing an opportunity for students to develop a training/educational program for their organization. Stakeholders from three states provided seven project opportunities. Topics included elementary and middle school agricultural education, customer service, public speaking, food sanitation and mentoring. The teams included 6-7 members representing both universities.

Teams were tasked to set up meetings with their stakeholders to gain more information about the project. Next, teams were asked to interview representatives of the target audience for their program to develop an understanding of the human experience central to the program. This information was recorded in an empathy map. Groups then used mind mapping to expand their thoughts and ideas before developing a lesson outline. The final project included a logic model, lesson outline and information to lead and evaluate the program. At the end of the semester, teams presented their programs and program resources to their stakeholders.

Over the course of the semester, students met with their own university class during regular class hours. The two universities met together in virtual, bi-weekly meetings on Zoom to connect as an entire group and to allow time to meet in their virtual teams. The joint time was used for teambuilding to assist in group formation, content learning related to aspects of the team projects and problem solving for team-related issues. The instructors also met individually with each team to discuss their individual challenges and questions.

Results to Date/Implications/Impact

This course produced seven training programs developed for five unique stakeholders. Feedback from stakeholders revealed that parts of all programs will be piloted or implemented by stakeholders, fulfilling the objective of providing students real world application.

Of the 40 students enrolled, 18 (45%) completed a retrospective pre-posttest survey about their experience in the course. The survey asked students to report their skills related to teamwork and communication concepts both *before* the course and *after* the course. The chosen skills came from the [university] human-centered design skill survey (citation, 2020).

Students reported a statistically significant ($p<.05$) increase in the following six skills, which all represent *intrapersonal* skills. These skills included: (1) managing time effectively; (2) thinking critically about problems and solutions; (3) being comfortable with what is unknown; (4) being comfortable finding new approaches to solve problems; (5) feeling comfortable making mistakes and learning from them; and (6) reflecting on their own thoughts and actions.

However, students did *not* show a significant increase ($p>.05$) in five skills on the survey, all of which are *interpersonal* skills. These skills included: (1) respecting the opinions of others; (2) collaborating with people from different backgrounds; (3) accepting the group's decision if it is different from your own; (4) sharing knowledge with teammates; and (5) being comfortable dealing with problems for which you cannot predict if they will be successfully solved.

These survey results refute previous research that suggests that when using human centered design principles, students learn to shift their frame of reference to be more empathetic, collaborate in more meaningful ways and appreciate the need to adapt and change their point of view when gaining more information (Goldman & Zeilezinski, 2016).

While it is important to value an *end product* that learners create, it is also critical for instructors to prioritize the *process* that is used to create the collaborative product. Instructors should continually consider designing learning experiences to improve both intrapersonal and interpersonal skills. Our experience reveals that just because students are working in teams does not mean that they perceive they are improving interpersonal skills. It is not known if students' intrapersonal skills did not actually improve, or if students simply did not perceive the improvement. Further research should explore this phenomenon.

Future Plans /Advice to Others

Future plans include exploring ways to help students improve intrapersonal skills when they are working as a team member. In an effort to address this concern, we plan to add a face-to-face weekend bringing together students from both universities, instructors, and stakeholders for in-person collaboration before initiating virtual teamwork.

Supporting virtual teams of students from two different universities proved to be a greater challenge than we originally anticipated. Some of the teams seemed to move to the performing stage quickly and create high quality programs, while other teams struggled. If virtual teams are a critical part of career expectations in the future, we need to explore ways to get over the hurdles of distance communication.

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