Interprofessional teamwork and collaboration among health professionals has been identified for decades as an effective way to improve quality and safety in healthcare (Institute of Medicine, 1999; Agency for Healthcare Research and Quality, 2000). Educating the next generation of health care providers to function using interprofessional collaboration (IPC) competencies is an important step in achieving the goal of safety and high quality care for patients in all settings (Interprofessional Education Collaborative, 2016). A healthcare team consists of individuals brought together for a common goal to work on a patient/community/global health problem, with each member offering a unique perspective and expertise. Individual curricular programs delivered in professional silos may or may not include opportunities for learning how to function in collaborative teams. Effective interprofessional education (IPE) models for developing IPC competencies are needed to ensure all professionals have shared understanding and expectations.

A review of IPE literature reveals the important Interprofessional Collaborative competencies that consist of knowledge, skills and attitudes that have been identified by an international team of experts (Interprofessional Education Collaborative, 2016). These competency statements can be used to guide education design of IPE for developing these outcomes. Educators of health care professions need to be deliberate in planning, designing and providing active interprofessional learning experiences that build toward IPC for transition into practice, as well as for ongoing practice as a continuing education focus.

Interprofessional education literature reveals that there is an opportunity to build upon the evidence of earlier studies to establish which design features are most effective in IPE models using robust research methods. Well-designed studies can help define best IPE practices that health educators can replicate. While some IPE features have been studied, others such as time span of education, and team level outcomes have not been addressed.

Interprofessional education in healthcare is a unique form of education that requires consideration of adult learning theory and beyond. It is important for educators to remember that adult learners are practical and self-motivated individuals who want to be included in the learning process, and who expect learning to be directly relevant to their immediate needs such as application to clinical practice (Knowles, 1984). I used the concepts of adult learning theory in this research study by designing active learning that incorporated problem solving, critical thinking and real-life application, as well as the concepts of Social Identity Theory (Allport, 1954) to address attitudes of stereotyping, hierarchies, and team cohesiveness that can affect teamwork outcomes. Attention to developing the right attitude in interprofessional (IP) students can help lay the groundwork for applying knowledge and skills that are not inherent, but must be learned and practiced.

The purpose of this research study was to explore the effect of time-span of IPE instruction on teamwork attitudes of interprofessional teams. The education intervention in this study was a researcher-designed team-training curriculum based on TeamSTEPPS® concepts that included didactic, discussions, and case studies, culminating in a high-fidelity interprofessional simulation (TeamSTEPPS Instructor Guide 2.0, 2014). To compare the effect of time-span of instruction, alternate cohorts of students were provided one of two time delivery methods; one group (n=16 teams) instructed in a single event over several hours, the other group (n=8 teams) instructed in small increments over several weeks. A convenience sample from three cohorts, consisted of 161 nursing, medical, and respiratory therapy students. For the purpose of simulation, they were randomly assigned to interprofessional teams of five to seven students. I measured team-level outcomes of each model by assessing 1) feelings of preparation with a single-item Likert scale, pre-simulation, 2) feelings of anxiety with a single-item Likert scale, pre-simulation, and 3)
teamwork attitude pre and post simulation with the Teamwork Attitude Questionnaire (TAQ) (TeamSTEPPS Instructor Guide 2.0, 2014).

Research question: Does teamwork attitude change following interprofessional team training and simulation while controlling for team training method? In order to compare the change of attitude over time at pre and post measurement points, and between the two training groups, a split plot two-way ANOVA test was conducted. Results of the split-plot ANOVA comparison of pre to post team TAQ total scores across intervention groups was equally and positively affected by both education models. The main effect of simulation (pretest to posttest) showed a statistically significant difference in teamwork attitude scores, $F(1, 22) = 14.67, p = .001$, with a moderate effect size indicated by partial $\eta^2 = .40$. This result indicated that there was no difference between education models for influencing post-simulation teamwork attitude. However, both the short-time and the extended time delivery of education led to significant increases in teamwork attitude following the IP simulation.

Research question: Which predictor team variables, pre-training teamwork attitude, feelings of preparation, or level of anxiety are most predictive of post-simulation teamwork attitude? To determine if post-simulation teamwork attitudes could be predicted by various pre-simulation measures, a multiple regression analysis was performed by entering pre-simulation teamwork attitude, feelings of preparation, and anxiety level into a model with the criterion outcome of post-simulation teamwork attitude for both education delivery models combined. Results revealed that the model was statistically significant $R^2 = .701$, $R^2_{adj} = .642$, $F(3, 15) = 11.741, p < 0.001$. Further analysis revealed that only pre-simulation teamwork attitude was a statistically significant predictor of post-simulation teamwork attitude, accounting for 79.39% of the variance. These results indicate that even feelings of preparation and levels of anxiety before engaging in IP simulations are less influential in teamwork attitudes than student baseline attitudes before a simulation.

This study design contributes to the IPE and team training research literature in two ways: 1) as a model for collecting data at the team unit level as opposed to the individual level, a noted gap in team research, and 2) comparison of education timespan deliveries on learning outcomes which has been unstudied. Teams function as a unit, and to measure at the individual level may misrepresent the effect of a collective team attitude. Team-level measures add a nuance that captures how team members can affect one another. There are examples in the literature of varied time spans of IPE with some designed for a short duration delivered in hours, and some that are associated with courses that span several weeks. However, there are no studies that directly compare the effectiveness of these very different time spans of IPE on student outcomes.

The results of this study indicate team-training positively affected teamwork attitude for both time delivery models, and builds on other studies that measured the effect of team training on teamwork attitudes at the individual level. Similar results were found in studies that provided short timespan IPE that demonstrated increased teamwork attitude (Kenaszchuk, Rykhoff, Laura, McPhail, & van Soeren, 2012; Lefebvre, Wellmon, & Ferry, 2015). Similarly, a study by Wong, Gang, Szyld, and Mahoney, (2016) used extended time span team training, and found statistically significant increases in teamwork attitude for teams of doctors and nurses comparing pre and post 1-year TAQ measurements. The results of this study corroborate previous studies that showed both short time and extended time team training can positively affect teamwork attitude. Results can be used by healthcare educators to inform their decisions for use of time and other resources for designing and implementing education for the purpose of increasing teamwork attitudes.

**Title:**
Changing Teamwork Attitudes With Interprofessional Education (IPE): A Comparative Study

**Keywords:**
Interprofessional education, Quantitative methods and Research
References:


Abstract Summary:
This session will describe an innovative research design comparing different time delivery of interprofessional education for the purpose of developing teamwork and collaborative competencies, with measures of team-level data for evaluation of student learning outcomes.

Content Outline:

1. I. Introduction
   A. Interprofessional teamwork and collaboration effect on quality and safety in healthcare.
   II. Review of the Literature
      A. Interprofessional collaboration competencies as a guide for education.
      B. Interprofessional education design gaps
         1. Time span of education delivery
         2. Measurement of team level outcomes
      C. Interprofessional education learning theory
         1. Adult learning theory
         2. Social Identity theory
   III. Methods
      A. Purpose: explore the effect of time-span of IPE instruction on teamwork attitudes of interprofessional teams.
      B. Independent variable: time-span of IPE instruction
         1. Short time delivery
         2. Extended time delivery
      C. Dependent variable: team-level teamwork attitude
      D. Research question 1: Comparison of two time deliveries of education on teamwork attitude pre and post simulation
1. Split plot two-way ANOVA
2. Statistical significance for both time delivery models for increasing post-simulation teamwork attitude

E. Research question 2: Prediction of teamwork attitude
   1. Multiple regression
   2. Statistical significance for pre-simulation teamwork attitude variable on post-simulation teamwork attitude in regression model.

IV. Discussion and Implications
   A. Contributions to literature in research design
   B. Contributions to literature in research outcomes

First Primary Presenting Author

**Primary Presenting Author**
Diane K. Brown, PhD, MSN
The University of Akron
School of Nursing
Assistant Professor
Akron OH USA

**Professional Experience:** 2015-2017: Director of Interprofessional Simulation at the University of Akron
1998-2017: Academic faculty educator in undergraduate nursing program with clinical expertise in critical care. Education researcher: I have multiple publications and presentations on topics related to nursing education and simulation pedagogies, and learning outcomes. Principle Co-Investigator for two HRSA grants in collaboration with Summa Health System, NEPQR and GWEP, both funded from 2015-18. QSEN Faculty training representative in 2011 NLN HITS scholar in 2012 with focus on informatics and technology in undergraduate education TeamSTEPPS Master trainer in 2014. Awarded the Excellence in Nursing Education faculty award from Sigma Theta Tau's Delta Omega chapter in 2014

**Author Summary:** Diane Brown is a nurse educator with over 20 years of experience teaching and implementing interprofessional education and simulation at the University of Akron. She was chosen as a QSEN representative in 2011, a HITS scholar in 2012, a TeamSTEPPS Master trainer in 2014, and was awarded the Excellence in Nursing Education faculty award from STT Delta Omega chapter in 2014. She has multiple publications and presentations on topics related to interprofessional education and simulation.