Improving EMS Student Preparation Through Interprofessional Enhancement and Team-Based Learning

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ABSTRACT
The purpose of this study was to determine the impact of a collaborative learning environment on the preparation of Emergency Medical Services. Students were provided with pre-hospital experiences across multiple disciplines to improve critical thinking, collaboration and resulting persistence. Faculty, through use of real-life simulations, exposed students to at risk patient scenarios to build experience with the delivery of patient care.

Keywords: Emergency Medical Services, Team-Based Learning, Interprofessional Education

INTRODUCTION
Employment of Emergency Medical Technicians (EMTs) and paramedics is expected to grow by 33 percent from 2010 – 2020 [1], above the average growth rate for other health-care occupations. The typical ambulance crew consists of two Emergency Medical Services (EMS) professionals and one paramedic. The crew relies heavily on teamwork and communication to provide adequate patient care. But traditionally, in EMS courses, lecture was the predominant mode of instructional delivery with use of PowerPoint presentations, whiteboards, videos and instructor lead discussion. This type of instruction helped to build the skills of a single paramedic, but did not address the communication or team building skills required to optimally work in pre-hospital settings.

Collaborative learning is grounded in Albert Bandura’s [2] social learning theory. Collaborative learning embodies many instructional strategies including cooperative and active learning. Following this conceptual development, a subset of active learning includes pedagogical techniques such as problem-based learning, inquiry learning, and team-based learning [3]. Team-Based Learning [4] builds a collaborative learning environment in the classroom. This environment allows for any problematic scenarios to be discovered in the classroom, not in the field. Team-Based Learning provides a platform for students to address mistakes found in a scenario as a team and then effectively communicates an appropriate plan of treatment. Scenario-based application activities supplies students with intended and unintended consequences and how to deal diagnose solutions without harming the patient.

Building on this model is the increased need for interprofessional education and practice. Interprofessional education (IPE) is an essential element in programs that seek to develop skill in team-based, patient-centered chronic illness care [5]. The World Health Organization (WHO) defines interprofessional education as a situation in which “students from two or more health care professions learn with, from and about each other to enhance collaboration in a shared learning environment and improve health outcomes” [6]. Interprofessional collaboration and educational experiences using interprofessional core competencies strive to increase students’ knowledge of the roles and responsibilities of other disciplines, and to improve communication and collaboration among disciplines in future work settings [7]. In 2010, the World Health Organization (WHO) recommended embedding interprofessional education and practice into all health services to mitigate the Global Health Workforce Crisis. The IOM asserts that the utilization of interprofessional education experiences will improve collaboration and promote effective provider-to-provider and provider-to-patient relationships in practice settings [7]. As a result, the Interprofessional Education Collaborative Expert Panel (2011) established four core interprofessional competencies for all health professionals: values/ethics, roles and responsibilities, interprofessional communication, teams and teamwork. These competencies were developed to ensure that health professionals are equipped with the skill sets needed to be effective team members in the delivery of patient-centered care. Utilization of the core competencies provides an opportunity to engage students in interactive team-based learning with other disciplines, and strives to better prepare the future workforce to practice in a team-based environment.
Through interprofessional education, health professions' students can gain a deeper understanding of their own practice and how they can complement and reinforce the professional practice of others. Therefore, learners within IP contexts could potentially improve their practice within their own professions. Because IPE cultivates collaborative practice, there is a potential for increased professional satisfaction where mutual support eases occupational stress, either by setting limits on the demands made on any one profession or by ensuring that cross-professional support and guidance are provided if and when added responsibilities are shouldered. Some of the other potential benefits of interprofessional education include: 1) improved relationships among healthcare team members; 2) increased trust between healthcare team members; 3) opportunity to dispel negative stereotypes, and 4) improved attitudes towards other professions. The interprofessional instructional framework utilized in this study was based on an approach developed by the Interprofessional Education for Collaborative Patient-Centered Practice initiative introduced by Health Canada [8]. Called “IP Enhancement,” it included implementation of interprofessional application activities used in Team-Based Learning within EMS courses.

**PROJECT ACTION PLAN**

Learning outcomes based on The National Highway Traffic Safety Administration (NHTSA) EMT-Paramedic: National Standards Curriculum was utilized. They included the following:

Students will:
- Connect critical thinking and collaborative skills learned through the use of TBL with EMS educational practices.
- Prioritize lifesaving techniques and treatment through TBL weekly activities.
- Negotiate through different phrases of “real-life” pre-hospital patient care in team settings using scenario simulations.
- Collaborate and formulate a pre – hospital patient care plan for possible scenarios that are present in the pre – hospital field.
- Develop technology skills through the use of an iPad during hands on TBL activities.

Instructor objectives included:
- Establishing course objectives, module objectives and activity objects that encompass analysis, synthesis and evaluation on the higher Bloom’s. Developing at least sixteen activities that will correlate with the learning objects.
- Creating professional development activities for other faculty members regarding TBL and interprofessional education

**METHODOLOGY**

Participants included thirty EMS students from the second level of the paramedic core curriculum. These students were enrolled in large urban university located in the southern region of the United States. Students were varied in age, gender, ethnicity and nationality. Research questions consisted of:

**RQ 1:** Will the utilization of TBL improve the critical thinking skills of students?
**RQ 2:** Will the utilization of TBL improve the collaborative skills of students?
**RQ 3:** Will there be fewer course withdrawals?

Assessments will include The California Critical Thinking Skills Test (CCTST), individual Readiness Assurance and team Readiness Assurance Tests, Peer Evaluation and student withdrawals.

**DATA ANALYSIS**

An Analysis of variance (ANOVA) treatment was used to determine statistical significance of student scores from the California Critical Thinking Skills Test. Scores were compared to students enrolled in similar courses where Team-Based Learning and IP Enhancement were not used. Descriptive data, generated by peer evaluation, was analyzed by using a selective coding technique to develop topical categories for each qualitative response set and a nominal ordinal method recording the relative frequency for each response category to quantify responses [9]. An Analysis of variance (ANOVA) treatment was used to compare withdrawal rates of students enrolled in the EMS courses and those enrolled in similar courses where Team-Based Learning and IP Enhancement were not used. Findings, conclusions and recommendations for future research was presented at the EISTA 2014 conference.

**REFERENCES**


