Designing Effective Interprofessional Education and Collaborative Practice Experiences

Robin RISLING-de JONG
College of Allied Health, University of South Alabama
Mobile, Alabama 36688-0002, United States

and

Jennifer L. STYRON
College of Nursing, University of South Alabama
Mobile, Alabama 36688-0002, United States

and

Ronald A. STYRON Jr.
College of Education, University of South Alabama
Mobile, Alabama 36688-0002, United States

ABSTRACT

This project explores a distinctive approach to teaching team-based care in health science and medical schools, utilizing both classroom style instruction simultaneously with onsite clinical practice. The conceived model focuses on Team-Based Learning (TBL) [1] and is referred to as the **T**BL with **I**nter**P**rofessional **E**xperiential **L**earning (TIPEL). The TIPEL model employs seamless integration of core competencies in curriculum and practice as it allows for flexibility to adapt to learners at various stages of learning in the practice of interprofessional team-based care. Physician Assistant students who participated in both a non-TIPEL and TIPEL clinical experience were surveyed using the Student Perceptions of Interprofessional Clinical Education- Revised Instrument, Version 2 (SPICE-R2) [2]. In addition to the SPICE-R2, an additional 13 open-ended questions were disseminated to solicit information regarding interprofessional core competency development and the effectiveness of TBL as an instructional approach in experiential learning settings. Overall, students were in agreement with the use of TBL as an effective instructional strategy and provided positive feedback when asked about TBL clinical practice experiences compared to those without the use of TBL. Results from this initial study indicate that the TIPEL model is an effective strategy for combining interprofessional education and collaborative clinical practice for experiential learning.

Keywords: Experiential Learning, Health Sciences, Interprofessional Collaborative Practice, Interprofessional Education, and Team-Based Learning.

1. INTRODUCTION

A shifting paradigm is occurring in the delivery of health care from the traditional medical model approach to the patient centered care model. Poor patient and population satisfaction of health care outcomes, health care costs, and patient safety reports are prompting the change [3, 4]. Team-based care is broadly recognized and accepted as a strategy that can successfully address these areas in need of improvement. Team-based care involves a community of health professionals of all practices and specialties working collaboratively together as a cohesive team for the promotion and prevention of diseased states of individuals and populations and for the treatment and management of chronic diseases. The philosophy behind team-based care is that through looped communication among health care professionals who discuss and carry out management plans together, improved outcomes in the delivery of health care and patient satisfaction occurs [5]. Team-based care also cuts costs by identifying and addressing early stage disease, reducing redundancies of treatment, labs, imaging and medications. Through collaborative communication, the patient remains at the center of care and is less likely to fall through the cracks as with the traditional model of siloed care and referrals.

As national healthcare organizations transition to a team-based approach to the delivery of healthcare, the need for both interprofessional education and interprofessional collaborative practice in health professions' training is critical. Students of all health professions must follow a curriculum that prepares them for a team-based health delivery system. The World Health Organization (WHO) defines interprofessional education as "two or more professions learning about, from, and with each other to enable effective collaboration and improve health outcomes" (p. 7) [6]; and interprofessional collaborative practice as "multiple health workers from different professional backgrounds work together with patients, families, carers, and communities to deliver the highest quality of care" (p. 7) [6]. While quite similar in nature, the applications of these two concepts construct highly diverse learning experiences.

Historically, health professions' curriculum is delivered in two phases: a didactic component focused on in-classroom instruction; and a clinical component focused on experiential learning. Interprofessional education (IPE) is commonly delivered in the didactic component of health professions' education; whereas interprofessional collaborative practice is usually executed during the clinical component of health professions' curriculum. Collaborative practice emphasizes the delivery of team-based care utilizing the transfer of knowledge gained from interprofessional education. However, the system of teaching IPE early in the didactic phase of the curriculum and collaborative practice in the later clinical component of the

curriculum lends itself to a disconnect and is often taught in a compartmentalized manner. Further, Lockeman et al. (2016) indicate the need for interprofessional socialization early on in health professions' curriculum and recommend designing experiential learning that allows students to apply IPE concepts in practice settings [7]. As a result, what makes this experiential learning experience unique is that it incorporates both interprofessional education and collaborative practice simultaneously to explore the effectiveness of interprofessional core competency knowledge and skill development.

The instructional design and development of this interprofessional experience utilized Wiggins and McTighe's Understanding by Design [8] and Michaelsen, Knight, and Fink's Team-Based Learning [1]. Understanding by Design's (UbD) framework was selected because it focuses on the assessment for understanding and learning transfer. UbD has a three-stage backward design that includes desired results, evidence, and learning plan. Team-based learning was selected as the instructional strategy for this framework because it provides a systematic approach to collaborative designed activities that supports the exchange of course content, collegial teaching, critical thinking, collaboration, and student engagement. These TBL deliverables represent the skill sets that the interprofessional experience intended to strengthen. TBL was also chosen because it can be implemented at any stage of the participating health professions' curriculum (i.e. teams comprising of beginner students and those about to graduate). This allows for an easier integration of various health professional students in a variety of programs. The innovative model designed, the **T**BL with **I**nter**P**rofessional **E**xperiential **L**earning (TIPEL) model, ensures seamless integration of core competency development and the application of team-based care.

Project faculty started with the development of higher order student learning objectives, and then worked backwards to design units for each clinical rotation that included individual and team assessments and application activities. Upon completion of the team-based learning session, each team would then move through the clinical experience focusing on applying core competency skills in clinical practice with their teams. Clinical rotations were supervised by a team of interprofessional faculty and included the use of a debriefing tool to assist in reflecting on the daily clinical experience with specific emphasis on the selected core competencies.

2. METHODS

The aim of this paper was to (1) determine student perceptions of the interprofessional core competencies, specifically team-based practice, roles and responsibilities, and patient outcomes; and (2) determine the effectiveness of using team-based learning as an instructional component in interprofessional clinical experiences. Emerging themes from the study will reveal insights into the development of leadership and competency skills of health professions' students and into the instructional design and development of effective interprofessional clinical experiences.

After IRB approval, the TIPEL (**T**BL with **I**nter**P**rofessional **E**xperiential **L**earning) questionnaire was disseminated to the physician assistant students (N = 40) who participated in the interprofessional clinical experiences over the 2015-2016 academic year. This particular group of students participated in two interprofessional clinical experiences, one that included the use of TIPEL as an instructional strategy and one that did not include TIPEL. Other health professions' students, nursing and medicine, were excluded due to the lack of participation in both TIPEL and non-TIPEL settings.

The TIPEL questionnaire included three sections. The first section utilized the Student Perceptions of Interprofessional Clinical Education- Revised Instrument, Version 2 (SPICE-R2) questionnaire developed by Zorek et al. (2016) [2]. This SPICE-R2 is a 10-item, three-factor instrument that solicits information from participants regarding their attitudes towards interprofessional health care teams and the team approach to patient care. The instrument contains three subscales dedicated to interprofessional teamwork and team-based practice (items 1, 4, 7, & 10), roles/responsibilities for collaborative practice (items 2, 5, & 8), and patient outcomes from collaborative practice (items 3, 6, & 9). The author granted permission to utilize the instrument for this study and provided reliability statistics for the instrument (α = .85); as well as each subscale that included patient outcomes (α = .78), interprofessional teamwork and team-based practice (α = .85), and roles/responsibilities for collaborative practice (α = .76) [7].

The second section of the questionnaire included six open-ended questions developed by the researchers to explore interprofessional core competency development. Information obtained from these open-ended items allowed researchers the ability to revise and modify the current program and strengthen the experiential learning opportunities students are provided. The last section of the questionnaire included seven questions developed by the researchers that solicited specific information regarding the use of team-based learning with interprofessional experiential learning (TIPEL) versus those experiences without the use of TIPEL. Information obtained from these open-ended items allowed researchers the ability to revise the instructional model as needed, and to modify programmatic objectives based on student feedback.

Data for this study was entered into the statistical analysis program called SPSS. Frequencies will be reported for each of the three subscales (team-based practice, roles/responsibilities, and patient outcomes) from the SPICE-R2 questionnaire. The six open-ended questions focused on the experiential learning experiences and seven questions regarding team-based learning were analyzed 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]. Data was transcribed and coded for themes, thus providing insight to the phenomenon surrounding responses.

Findings

To answer the first research question, students completed the SPICE-R2 instrument along with six-open item responses specific to interprofessional core competency development. SPICE-R2 mean scores for each domain were analyzed to determine student agreement towards interprofessional health care teams and the team approach to patient care. The six open-ended questions from section two of the TIPEL questionnaire provided qualitative data regarding core competency development. This data was coded to allow for an in-depth exploration of core competency development and effectiveness

of the interprofessional experiential learning in building these skill sets.

To answer the second research question, the third section of the TIPEL questionnaire included five closed-ended and two open-ended items developed by the researchers. Mean scores were calculated from the five close-ended items regarding the use of team-based learning with interprofessional experiential learning (TIPEL). The two open-ended items sought to determine strengths, if any, of the experience that utilized the TIPEL model as an instructional strategy for teaching interprofessional core competencies in a clinical setting. Data from these two items were coded to determine themes, if any, of the Physician Assistant students.

3. RESULTS AND DISCUSSION

Surveys were administered using Class Climate, a web-based evaluation tool utilized by the institution to assess teaching and learning. Results were exported from Class Climate and analyzed using the SPSS statistical analysis program. Descriptive statistics were conducted to provide evidence of student perceptions of the interprofessional core competency development and the effectiveness of team-based learning as an effective instructional strategy. Additionally, qualitative data obtained from open-ended items in sections two and three of the TIPEL questionnaire were used to confirm quantitative findings, provide insight into the core competency development, and determine strengths of the instructional strategy deployed**.**

Descriptive Statistics

TIPEL Questionnaire Section 1, SPICE-R2: Physician Assistant (PA) students from the Fall 2015 and Spring 2016 semesters were solicited for participation in June of 2016. Of the 40 PA students, 39 completed the TIPEL questionnaire representing a 97.5% return rate. For the SPICE-R2 section of the questionnaire (section 1), participants were asked about his/her attitude toward interprofessional teams and the team approach to care on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Overall, scores revealed that students were in agreement with each interprofessional subscale on the SPICE- R2. Table 1 provides descriptive information on each of the 3 subscales.

Table 1

Means and Standards Deviations for SPICE-R2 Subscales

Item	Min	Max	*M*	*SD*
Interprofessional Teamwork and Team-Based Practice	2.00	5.00	4.32	.65
Roles/Responsibilities for Collaborative Practice	2.33	5.00	3.99	.72
Patient Outcomes from Collaborative Practice	2.00	5.00	4.15	.74

Four items (1, 4, 7, and 10) comprised the interprofessional teamwork and team-based practice subscale. Students indicated that working with students from different disciplines enhanced their education (M = 4.38, SD = .71) and health students should be involved in teamwork with students from different disciplines to understand their respective roles (M = 4.38, SD = .91) were the most important items concerning teamwork and team-based practice. Table 2 provides descriptive information on each item.

Table 2

Means and Standards Deviations for Interprofessional Teamwork and Team-Based Practice

Item	Min	Max	*M*	*SD*
Q1: Working with students from different disciplines enhances my education.	2.00	5.00	4.38	.71
Q4: Participating in educational experiences with students from different disciplines enhances my ability to work on an interprofessional team.	1.00	5.00	4.18	.83
Q7: Health professional students from different disciplines should be educated to establish collaborative relationships with one another.	3.00	5.00	4.36	.63
Q10: During their education, health professional students should be involved in teamwork with students from different disciplines in order to understand their respective roles.	1.00	5.00	4.38	.91

Three items (2, 5, and 8) comprised the roles/responsibilities for collaborative practice subscale. Students agree that roles and responsibilities are important but scored lower on items related to clearly defined roles (M = 3.92, SD = .93) and curriculum requirements of other health professions' students (M = 3.92, SD = .81). Table 3 provides descriptive information on each item.

Table 3

Means and Standards Deviations for Roles/Responsibilities for Collaborative Practice

Item	Min	Max	*M*	*SD*
Q2: My role within an interprofessional team is clearly defined.	1.00	5.00	3.92	.93
Q5: I have an understanding of the courses taken by, and training requirements of, other health professionals.	2.00	5.00	3.92	.81
Q8: I understand the roles of other health professionals within an interprofessional team.	2.00	5.00	4.11	.73

Three items (3, 6, and 9) comprised the patient outcomes from collaborative practice subscale. Students agreed that interprofessional work improves patient satisfaction (M = 4.39, SD = .79) and patient centeredness (M = 4.36, SD = .74). Table 4 provides descriptive information on each item.

Table 4

Means and Standards Deviations for Roles/Responsibilities for Collaborative Practice

Item	Min	Max	*M*	*SD*
Q3: Patient/client satisfaction is improved when care is delivered by an interprofessional team.	2.00	5.00	4.39	.79
Q6: Healthcare costs are reduced when patients/clients are treated by an interprofessional team.	2.00	5.00	3.72	.97
Q9: Patient/client-centeredness increases when care is delivered by an interprofessional team.	2.00	5.00	4.36	.74

TIPEL Questionnaire Section 2, Interprofessional Core Competency Development: This section of the questionnaire solicited qualitative information about interprofessional core competencies, including six open-ended items. The first question asked students to identify similarities observed between professions. Thirty-eight students responded to this item on the questionnaire. Emergent themes included the focus on patient-centered care and the similarity of skill sets among various health professions. Overwhelmingly, students recognized that all professionals were focused on patient-centered care. Two examples of statements made include "All professions I interacted with during this experience emphasized a patient-centered approach when interacting with residents and clients" and "Our focus is generally the same: patient-centered care." In regards to skill sets, students felt the experience exposed them to similarities they may not have necessarily known. One student was surprised and stated, "I observed several similarities among our training and was shocked at how similar the different classes we have to take can be even if we are in different fields of practice." Another student went on to discuss their positive reaction to similar training, "Through IPE experiences I was pleased to discover that we all (PA's [Physician Assistants], nurses, and PT [Physical Therapy] students) had a significant amount of understanding of physiology and pharmacology, clinical presentations, and treatment options."

The second question asked students to identify differences observed between professions. Thirty-eight students responded to this item on the questionnaire. The major difference was the approach each profession took when treating a patient, which was suggested as a strength to providing team-based care. One student stated, "Though our general understanding was shared, it was clear that our foci were different." A second student confirmed this theme by stating, "Nurses, PTs [Physical Therapists] "We do have very different roles from each other. But those differences make us work well as a team."

The third question asked students to determine whether his/her attitude changed about working with professionals in an interprofessional setting over the course of the experience. Of the thirty-eight respondents, the majority (N = 23) felt his/her attitude changed over time because of the experience. Many of the PA students felt their knowledge of the nursing role increased, which greatened their respect and understanding for the nursing profession. One student stated, "I was unsure of the scope of nursing practice. Nurses do most of the hands on work. I had thought that I, as a PA, would do a lot of that; but I now understand that most of my work will be in diagnoses of patient ailments. The nurses are quite knowledgeable and I now know how much I can rely on their expertise, whereas I did not before."

The fourth question asked students whether the experience provided them with the opportunity to develop as leaders. Over seventy percent (N = 29) of the thirty-nine students who responded felt the experience provided leadership development opportunities. Many students provided rationale which included the realization that when delivering team-based care, the role of the leader will often change based on the individuals' expertise and strengths. One student felt the experiences provided a safe space to practice developing these skills by stating, "We were able to each participate in different leadership roles throughout the experience, and I believe putting those leadership skills into action in a low risk setting was a great incubator for developing the skills we need to be great healthcare leaders."

The fifth question asked students to select the interprofessional core competency that he/she gained the most skill in during the experience. Of the twenty-five students who responded, 13 (50%) felt communication was the core competency that he/she developed the most skill in; with another seven students (28%) feeling teams and teamwork was the most developed core competency. Team-based learning is an instructional strategy best known for facilitating growth in communication and collaboration, therefore complimenting the development of both of these interprofessional core competencies. One student who felt they gained the most in communication discusses their rationale by stating, "Communication, in particular, resonated with me. I gained both the understanding of its importance as well as the comfort to openly communicate with my team. I believe that the IPE experiences have made me less fearful of openly discussing and asking questions, as I'm no longer as worried about appearing unknowledgeable--which can be detrimental to patient quality of care. I learned that we all have different abilities and skills, and not to be afraid to ask for help, or discuss a patient." Another student who indicated growth in communication stated, "I really liked learning how to communicate with various professions about the patient to make sure that everything was being done to positively impact the patient. I saw how communication must be implemented among everyone that is caring for a patient to make sure that the patient is at the center of care."

The sixth question asked students whether he/she thought delivering care in an interprofessional setting improved patient satisfaction and health outcomes. Thirty-six of the thirty-eight participants (95%) felt that care in an interprofessional setting provided an opportunity to improve patient satisfaction and health outcomes. Although the majority of students indicated patient outcomes were improved, there were no concreate examples of how interprofessional teams implemented health

outcomes assessment and measurement. Statements typically were vague with regards to how satisfaction and outcomes were improved with one student stating, "I do believe that this can improve patient satisfaction because a patient with multifactorial problems usually wants specialists in each field to care for each problem. I do believe that this will help the patients' health outcomes seeing as different professions and specialties have more knowledge on certain illnesses."

TIPEL Questionnaire Section 3, TBL with InterProfessional Experiential Learning (TIPEL) Effectiveness: The final section of the TIPEL questionnaire included five closed-ended items, soliciting information on the use of team-based learning (TIPEL) in interprofessional clinical experiences on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Students agreed that the TIPEL model helped apply core competencies (M = 4.23, SD = .74), increased accountability (M = 4.10, SD = .82), and that they are better prepared because of the TIPEL strategy implemented (M = 4.05, SD = .89). Table 5 provides descriptive information on each item.

Table 5

Means and Standards Deviations for TIPEL Items

Item	Min	Max	*M*	*SD*
Q1: Working in teams has helped me apply interprofessional core competencies into my clinical skill set.	2.00	5.00	4.23	.74
Q2: Staying in permanent teams the entire clinical rotation held me accountable to team members.	2.00	5.00	4.10	.82
Q3: Through the use of team-based learning and service learning projects I feel more prepared to work in interprofessional clinical environments.	1.00	5.00	4.05	.89
Q4: Team-based learning in combination with the team-based approach to care in the IP clinical activities made a notable difference in patient outcomes.	1.00	5.00	3.77	.99
Q5: The use of TBL made this clinical experience more interactive and engaging than clinical experiences that did not include an interprofessional curriculum component.	1.00	5.00	3.72	1.14

This section of the questionnaire also included two open-ended items that solicited qualitative information about the instructional model utilized, TIPEL. The first question asked students to compare his/her TIPEL and NON-TIPEL experiences and identify how, if any, team-based learning help strengthen his/her understanding of the interprofessional core competencies. Thirty-three students responded to this question, with 23 students (70%) indicating the TIPEL model strengthened the understanding of interprofessional core competencies and 4 students (12%) indicating it was not effective. The other six responses (18%) were categorized as not applicable as they did not provide appropriate responses to the questions. Comments centered on the ability to use core competencies in real-world application. One student stated, "The TBL's asked us to apply core competencies to differing situations. Any time students apply knowledge in different situations, greater learning takes place." Another student stated, "TBL made me accountable to my team. It allowed be to apply the principals of each competency and there were several learning opportunities that presented themselves while doing the TBL exercises."

The second question asked students whether or not they felt team-based learning was an effective instructional strategy for teaching interprofessional core competencies in a clinical setting. Of the thirty-six students who responded, 28 students (78%) felt it was effective, 4 students (11%) felt it was not effective, and 4 students (11%) were unsure whether the instructional strategy made a difference. While a majority of students indicated that the strategy was effective, there was little discussion as to why he/she felt this way. Many of the students also provided recommendations for improvement such as, "time allocations on activities". Another student recommended, "an introduction for each profession [represented at the experience] and how the role/responsibilities are defined. It was very difficult asking students what they can do when they were not sure themselves."

4. LIMITATIONS AND RECOMMENDATIONS

While the TIPEL model appears to be a promising and innovative strategy for teaching team-based care in a community-based site, there are recognizable limitations to this study. This study was only administered to Physician Assistant students. The clinical experience took place in a Health and Wellness clinic that was preceptor led in a community-based setting rather than at a functioning clinical site. The types of health professionals that were involved in health professional teams were limited to Physician Assistant students, Nursing students, and Medical students. The small sample size used in this study is a limiting factor, as well in terms of applicability to the larger size population of health profession students. This study will yield stronger results by involving all health professional students in a team in both the TIPEL and Non-TIPEL experience for comparison. This study will also be strengthened by duplication of the study in multiple practice sites in order to evaluate results and outcomes. Furthermore, using larger sample sizes will lend validity to the study outcomes.

5. CONCLUSIONS

Preparing the next generation of health professional students to effectively and efficiently practice the delivery of health care in the patient centered care model using team-based care is a challenge faced by many leaning institutions. All too often,

classroom instruction loses its momentum by the time the student makes it into the clinical phases of their programs. Facilitating team-based learning across professions in different colleges whose students are at different stages of learning presents a special kind of challenge all of its own. The TIPEL method combines a unique way to overcome these barriers by implementing a backward design curriculum coupled with the team-based care learning applications in a routine clinic environment. This strategy meets each individual student where they are at on the spectrum of learning team-based patient centered care and integrates well into the various health professions' curriculum.

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