



Application of validated instruments to assess university-wide interprofessional service-learning experiences



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ABSTRACT

Background and purpose: Accreditation requirements are now mandating more interprofessional experiences for health sciences students. This mixed-methods study utilized the Team Skills Scale (TSS), the Student Perceptions of Interprofessional Clinical Education-Revised (SPICE-R) instrument, and reflection questions to assess university-wide interprofessional service-learning experiences.

Method: Survey data from the TSS and SPICE-R were compiled from 16 interprofessional education (IPE) service-learning activities involving 666 students from spring 2012–spring 2015. Multiple regression analysis applying generalized estimating equations (GEEs) was performed to assess for relationships between pre and post score change and IPE variables including year in curriculum, type of IPE event (one-time versus longitudinal), and prior IPE experience. Reflection data were also captured and analyzed for themes.

Results: Significant improvements in scores after the IPE activities were detected for both instruments used. Significant improvements were observed at all curriculum stages only with the TSS and not the SPICE-R. Scores were greater and improved more for a longitudinal IPE course versus a one-time event with the SPICE-R, but not the TSS. Both instruments showed similar patterns of improvements regardless of prior IPE experience. Reflection data aligned well with the Core Competencies for Interprofessional Collaborative Practice.

Conclusion: These results suggest utility for both the TSS and SPICE-R in conjunction with reflection questions, mirroring the 2015 Institute of Medicine (IOM) guidance (Institute of Medicine of the National Academies). The SPICE-R may be more appropriate for longitudinal IPE experiences while the TSS may have broader applicability. These results provide insight for institutions strategizing for IPE assessment to meet accreditation standards.

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Introduction

Interprofessional collaborative practice is quickly becoming an expectation in health sciences education and is supported by the mandate of accreditation requirements.¹ Academic institutions are now required to develop and implement interprofessional learning

experiences for students as part of their core education. These learning experiences vary per institution but often include pedagogies involving service-learning activities.² Service-learning has been identified as a pedagogy for IPE that facilitates interprofessional interactions in a real world context helping students learn the authentic experience of teamwork.³ In addition to allowing for team interactions, interprofessional service-learning has been identified as an effective method for addressing the needs of vulnerable populations.⁴

The Institute of Medicine (IOM) recently published a report entitled *Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes: A Consensus Study*.⁵ The IOM report identifies the need for rigorous and relevant assessment of interprofessional education and practice. Interprofessional service-learning requires assessment to determine its effectiveness in teaching team skills and other interprofessional competencies. In

Abbreviations: ATHCT, Attitudes Toward Health Care Teams Scale; GEE, Generalized Estimating Equation; IEPS, Interdisciplinary Education Perceptions Scale; IOM, Institute of Medicine; IPE, Interprofessional Education; IPEC, Interprofessional Education Collaborative; IRB, Institutional Review Board; PACT, University of Washington Performance Assessment for Communication and Teamwork Tool; RIPLS, Readiness for Interprofessional Learning Scale; TSS, Team Skills Scale; SPICE-R, Student Perceptions of Interprofessional Clinical Education-Revised; TOSCE, Team Observed Structured Clinical Encounter.

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addition to designing and implementing IPE, academic institutions also must develop a robust assessment plan to demonstrate competency in IPE both to measure pedagogical impact and report to accrediting agencies. In order to assess learning, the optimal assessment instruments in IPE must be identified.

There are over 120 instruments that have been identified to assess the impact of IPE activities.⁶ Those that are more commonly cited in the literature and are applicable for a variety of disciplines include the Team Skills Scale (TSS),⁷ the Readiness for Interprofessional Learning Scale (RIPLS),⁸ Attitudes Toward Health Care Teams Scale (ATHCT),⁹ Interdisciplinary Education Perceptions Scale (IEPS)¹⁰ and a newer one, Student Perceptions of Interprofessional Clinical Education-Revised (SPICE-R).¹¹ It is not clear which of these instruments, if any, is most appropriate to utilize for interprofessional service-learning experiences longitudinally throughout a university-wide IPE curriculum to assess changes in knowledge, skills, abilities and attitudes towards IPE.

Two of the most widely used instruments, RIPLS and IEPS, were recently criticized due to lack of sensitivity to detect changes in attitudes and perceptions over time.¹² Likewise, Dominguez, Fike, MacLaughlin, and Zorek¹¹ recently compared the reliability and construct validity of the ATHCT-revised and SPICE-R instruments in 221 first-year nursing, optometry, pharmacy, physical therapy and health administration students.¹¹ They found that the SPICE-R provided better goodness of fit, construct validity and reliability when compared to the ATHCT-revised instrument.

The TSS measures perception of capabilities for effective team interactions and consists of 17 questions at 5 points each (1 = poor to 5 = excellent), for a maximum score of 85. In addition, the newer SPICE-R¹¹ instrument was also used to assess student perceptions of appropriateness and benefits of IPE. It is a 10 question instrument, with each question at 5 points (1 = strongly disagree to 5 = strongly agree) for a maximum score of 50. As reported in the literature, study investigators have noted some students rating themselves highly at baseline with some of the instruments.¹³

In addition to quantitative assessment, the IOM report called upon academic institutions to include qualitative assessment as a core part of interprofessional education assessment.⁵ In order to meet this need, the addition to the TSS and SPICE-R, a collection of reflection questions were also used to assess student learning. These questions were developed with the intent to capture student perceptions of IPE.

The purpose of this mixed-methods research study was to evaluate the appropriateness of the TSS, the SPICE-R instrument and established reflection questions for use throughout the new IPE curriculum proposed by the Interprofessional Education Steering Committee at an institution developing curriculum for seven health sciences programs to meet emerging accreditation requirements. Investigators intended to determine whether the instruments are appropriate for university-wide use longitudinally in a variety of IPE activities.

Methods

This study was reviewed by the Creighton University Institutional Review Board (IRB) (project #703793-1) and was determined to be exempt. This study used a mixed-method design integrating quantitative and qualitative methods based on data and methodologic triangulation techniques.¹⁴ This approach was based on recent IOM recommendations for measuring the impact of IPE on practice and patient outcomes.⁵

For the quantitative assessment portion of this study, pre- and post-interprofessional service-learning survey data from the TSS and SPICE-R instruments were compiled into a database from 16 required or elective service-learning IPE activities involving 666 undergraduate

and professional students from spring 2012–spring 2015. Pre-surveys were completed by students at the beginning of each respective event or on the first day of class if embedded within a course. Post-surveys were completed at the end of the respective event or on the last day if embedded within a course. The TSS has been routinely used at our university for some time and is well documented in the literature. The newer SPICE-R instrument was also included in this analysis because it was recently shown to be superior to the ATHCT-revised instrument.¹¹ These instruments were chosen in an effort to determine the best for university-wide assessment plan. IRB approval/exemption was obtained for each independent event and also for this overall analysis. When available, data captured included student discipline, student year in curriculum, presence of previous interprofessional experience and survey data. Because the surveys were voluntary and otherwise anonymous, other baseline demographics are unavailable. Some IPE activities only utilized one instrument, thus accounting for difference in the sample sizes.

Statistical analysis included descriptive statistics and generalized estimating equation (GEE) modeling using SAS 9.4 (SAS Institute Inc., Cary, North Carolina). GEEs assessed longitudinal changes (from pre-to post-) of instrument scores among groups that differed by (1) Year in curriculum (2) Prior IPE experience and (3) Length of interprofessional experience. Separate GEE models with empirical standard error estimates were performed to assess for a relationship between the changes in instrument scores (from pre to post) and (1) Year in curriculum (2) Prior IPE experience and (3) Length of interprofessional experience. To address the pattern of changes, the interaction between time (pre and post score change) and the variables assessed was conducted in all models. A *p* value less than 0.05 was considered statistically significant.

The qualitative portion consisted of a sample of 145 students who participated in an interprofessional service-learning activity entitled Project Homeless Connect in spring 2015. This included a mix of students there for the one-time event and also those finishing up a semester-long course in interprofessional service-learning. This event brings 300–400 homeless clients to the university campus for health-related assessments and social services. Health science and undergraduate students work in interprofessional teams at several health stations such as vitals, medication recall, musculoskeletal, immunizations, and medical/dental care. These students responded, in writing, to standardized reflection questions about the interprofessional event. The questions were as follows:

1. What is the value of interprofessional practice and collaborative care?
2. What does it mean to be “ready” to collaborate as a health care practitioner?
3. What do you foresee as the greatest challenge to interprofessional collaboration?
4. What skills do you bring to the collaborative process of a team?

These written reflections were collated and analyzed using a modified method delineated by Morse.¹⁵ Data were initially coded using broad categories or groupings. These broad categories were then more precisely defined in content to move from open coding to axial coding.¹⁶ Axial coding groups data at a subcategory level, refining data reduction during the comprehending stage. The last stage involved synthesizing the grouped data into themes. Lastly, these themes were assessed for alignment with the Core Competencies for Interprofessional Collaborative Practice.¹⁷

Results

From 2012 to 2015, 666 students completed interprofessional service-learning experiences at Creighton University, most of

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