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ABSTRACT

The Accreditation Council for Pharmacy Education Standards 2016 state that colleges of pharmacy must assess student achievement and readiness to contribute as a member of an interprofessional collaborative patient care team. There are a limited number of assessment tools available to achieve this part of the Standards. The purpose of this Case Study Report is to describe the process that one college of pharmacy took to develop an interprofessional education (IPE) assessment tool to be used for their longitudinal assessment approach for IPE in the didactic portion of the curriculum. Strategies for the development of an assessment tool are provided through three themes: continuous refinement, collaboration and streamlining. Next steps for the implementation of the assessment tool, as well as evaluating its validity and reliability, are discussed.

Keywords: interprofessional education, pharmacy education, assessment, rubric, assessment tool development

INTRODUCTION

Pharmacists are increasingly asked to serve in clinically-oriented interprofessional teams. As such, the Accreditation Council for Pharmacy Education (ACPE) Standards 2016 (hereafter, Standards 2016) have been increasingly aligning the preparation of pharmacy students with these workforce responsibilities.¹ For example, Standard 24.3 directs the assessment of student readiness to contribute as a member of an interprofessional collaborative healthcare team.¹ Other groups, such as the Interprofessional Education Collaborative (IPEC) have also provided guidance as to how to prepare pharmacy students for interprofessional practice.² At the individual college of pharmacy level, in order to understand if students are being prepared at the programmatic and student level for interprofessional practice, intentional and appropriate assessment is critical. Assessment of learning from interprofessional education (IPE) activities poses many logistical challenges including the high numbers of students, the various disciplines, and the number of evaluators needed to provide individual student feedback. Furthermore, as interprofessionalism extends beyond the knowledge domains and also encompasses attitudes, behaviors, and skills, interprofessional assessment quickly becomes relatively complex and multifaceted.

Literature shows that most tools rely on self-reported data and assess attitudes or perceptions toward IPE.³ Even though there are a growing number of repositories that contain IPE assessment tools, most of those tools measure student-reported attitudes toward IPE, as well as readiness for IPE.⁴⁻⁶

There is a need for assessment tools that examine educational outcomes rather than only attitudes and readiness.⁷ A tool that allowed faculty to assess students was needed; the tool should provide direct and clear mapping to the school's ability-based outcomes (ABOs) and the IPEC Core Competencies for Collaborative Practice (hereafter, IPEC Core Competencies). With the paucity of literature regarding longitudinal assessment of IPE throughout pharmacy curricula, a local workgroup was formed to develop an assessment approach to measure progression and competency of students during IPE learning activities. This case study report describes the process of developing an assessment tool for use by an evaluator during IPE learning activities that can be implemented throughout the pharmacy curriculum to measure students' attitudes, behaviors and skills.

DESCRIPTION OF THE CASE

Problem Identification

Ferris State University College of Pharmacy (FSU COP) has two campuses [Big Rapids, MI for first professional year (P1) and second professional year (P2) students; Grand Rapids, MI for third professional year (P3) students], a class size of approximately 150 pharmacy students, and is not integrated with an academic medical center. As the breadth and depth of IPE has increased, it was realized that IPE was both contained in and threaded through many different courses.⁸ At FSU COP, the culture traditionally was that development of course-level assessment methodology was largely dependent on the faculty member(s) teaching that course. As a result, each IPE learning activity in the curriculum utilized a different assessment tool.

In addition, inadequate continuity of IPE assessment limited the ability to demonstrate student-level development. Using uniform performance criteria to consistently assess IPE

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learning activities with shared themes would allow for more reliable feedback, as well as longitudinal assessment of student growth and development. Longitudinal assessment data could be of obvious benefit to students as they track their own development, but could also be of benefit to FSU COP for steering programmatic improvement. There was a desire to increase the intentionality of IPE in the curriculum, and a corresponding need to simultaneously increase the intentionality of IPE assessment, both within and between courses.

There are currently five required IPE learning activities embedded within introductory pharmacy practice experiences (IPPEs) and skills labs. The workgroup felt that it would be beneficial to focus on two of those learning activities, one that occurs during the P2 year and the other that occurs during the P3 year due to these activities having large numbers of faculty evaluators present and because they focus on multiple IPEC Core Competencies. During the P2 learning activity, pharmacy students are put into groups with seven other health professions (athletic training, medicine, nursing, physical therapy, physician assistant, social work, and speech language pathology) to complete a patient case that progresses through five different scenarios with one patient. The students work as a team to complete the five sections, which allows them to see individual and overlapping roles and responsibilities of the professions present, as well as providing some ethical dilemmas to discuss. During the P3 learning activity, pharmacy

students work with two to three other health professions, which can include medicine, physician assistant, nursing, or physical therapy. The student teams work together on a standardized patient simulation where they interview the patient, determine a discharge plan and communicate that plan to the patient.

Assessment Tool Development and Pilot Testing

During the initial stages of developing an IPE assessment tool during the spring 2016 semester, the workgroup determined that common assessment themes existed between IPE and non-IPE learning activities. For example, oral communication is assessed in various didactic courses, as well as during IPE learning activities, and assessment crosses into attitudes, behaviors, and skills. Since those commonalities exist, the feeling was that there may be considerable value in developing an assessment tool that could be used for both IPE and non-IPE activities. In order to address this question, the workgroup began by gathering all current assessment tools currently in use by FSU COP for IPE and related pharmacy skills lab activities. In addition, a literature search was conducted to identify assessment tools that could be used by an evaluator to assess interprofessional attitudes, behaviors, and skills. In general, the authors felt that the existing tools that were reviewed (described further below) did not fit the assessment needs of FSU COP and a process for developing a customized assessment tool was initiated.

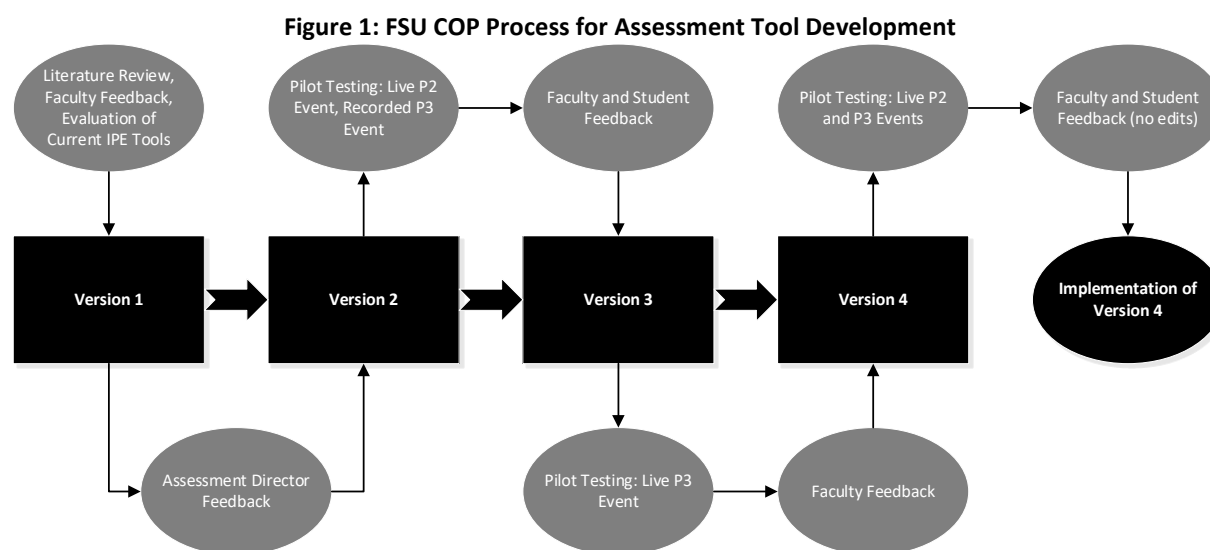


Figure 1 outlines the process that the workgroup utilized. As an initial starting point, the workgroup gravitated towards the Association of American Colleges and Universities (AAC&U) VALUE rubrics.⁹ The AAC&U VALUE rubrics have been developed and tested by educational professionals from over 100 higher educational institutions and have been available for several years. Of the 16 VALUE rubrics available, each assessing a different learning outcome, the workgroup noted that five

specific VALUE rubrics (oral communication, written communication, teamwork, and critical thinking and problem-solving skills) may be a good fit for FSU COP needs.

The workgroup reviewed each of the five VALUE rubrics for fit within the framework of attitudes, behaviors, and skills where assessment tools were needed for IPE and non-IPE learning activities. To maintain consistency with the newly adopted

assessment tool set for Advanced Pharmacy Practice Experiences (APPEs) at FSU COP, the competency scale of unacceptable, novice, competent, and proficient was suggested. The VALUE rubrics contain four competency levels; however, the terminology is different. The group began creating Version 1 by discussing and drafting potential language that could be incorporated into the assessment tools. The Version 1 sample in Appendix 1 demonstrates the drafted language from the Oral Communication VALUE Rubric.¹⁰

However, given that one overarching goal of the new assessment approach for IPE was to demonstrate pre-APPE competency, it was important that the draft assessment tools be congruent with the APPE assessment tools, which were based on activities. As a result, the IPE workgroup refocused the approach to specific IPE learning activities already in existence in the curriculum, rather than an assessment tool that could be used for IPE and non-IPE learning activities. Since the ABOs were based on CAPE outcomes and also mapped to IPEC Core Competencies, learning activities already mapped to either the ABOs or IPEC Core Competencies could be easily matched to performance criteria.¹¹ Existing literature on current assessment tools that were available to assess individual students by an evaluator on IPEC Core Competencies were evaluated. There are a small number of assessment tools available such as the Individual Teamwork Observation and Feedback Tool (iTOFT),¹² Interprofessional Collaborator Assessment Rubric (ICAR),¹³ and Team Observed Structured Clinical Encounter (TOSCE).¹⁴ The FSU COP Director of Assessment provided feedback throughout the process to ensure the methodology was in line with other assessment activities and would be likely to provide useful data. As development progressed, the workgroup defined criteria, such as having an assessment tool with a small amount of individual items to assess due to the large number of learners in the program and having the competency levels match with the APPE rubrics.

Early in the fall 2016 semester, Version 2 of the assessment tool was created based on three IPEC Core Competencies: interprofessional teamwork and team-based practice, interprofessional communication practices, and roles and responsibilities for collaborative practice.² A sample of the interprofessional communication practices rubric is shown in Appendix 1. The workgroup aimed for consistent style and wording with each IPEC Core Competency and each sub-competency was divided into specific assessable skills.

The Version 2 assessment tool was pilot tested in both P2 and P3 IPE learning activities. A portion of the P2 class ($n = 106$), who completed a live IPE learning activity during the middle of the fall 2016 semester, used the assessment tool as a means of self-assessment of their performance. After completing the assessment tool, they were presented with three statements and asked to rate the assessment tool using a five-point Likert-type scale (1-5 where 1 is strongly disagree and 5 is strongly agree). The statements were: the rubric was a fair assessment of the IPE

activity, the rubric was easy to use, and the rubric definitions were easy to follow. Results of that survey are shown in Table 1; the students were “neutral” with regards to the three statements. Additionally, a group of two faculty reviewed video recordings for ten students in a P3 IPE learning activity to simulate use of the tool. Qualitative feedback was obtained by the faculty, and consensus was that the tool was too cumbersome and was confusing to the evaluator. Specifically, there were an excessive number of areas to assess with limited detail to guide the evaluator in differentiating between the specific competencies.

The development of the Version 3 assessment tool incorporated feedback from the P2 and P3 pilot testing efforts. The number of competencies assessed were condensed to remove overlapping concepts and any duplication. Additional detail was added to the performance criteria to provide the evaluator with a clearer definition of the expected level of performance.

Version 3 was evaluated by all workgroup members, and qualitative feedback from a convenience sample of faculty collaborators at other institutions was obtained. These faculty have worked with FSU COP to develop IPE learning activities and had observed pharmacy students during those learning activities in the past. Versions 1 and 2 were identical for the P2 and P3 IPE learning activities. This held true for Version 3 except for one line that was added to the P3 assessment tool regarding application of pharmacy knowledge to contribute to the interprofessional team. In addition, pilot testing of Version 3 took place during a P3 IPE learning activity at the end of the fall 2016 semester. Minor modifications in language for the performance criteria were made based on feedback to create Version 4. Version 4 of the rubric has five rubric items to assess in the P2 rubric and six rubric items in the P3 rubric. Appendix 1 shows a line from Versions 3 and 4, which went unchanged based on Version 3 feedback.

In the spring 2017 semester, Version 4 in its final form was used at both live P2 and P3 learning activities. Qualitative feedback on Version 4 was obtained from pharmacy faculty who were involved in creating the assessment tool, pharmacy faculty who were not involved in creating the assessment tool, and faculty from other disciplines who evaluated the IPE learning activities. A group of P2 students ($n = 147$) out of the same P2 cohort who tested Version 2 also used the Version 4 assessment tool as a means of self-assessment and responded to the same three statements regarding the tool as they did in the fall 2016 semester. Table 1 outlines the shift in responses, with all statements seeing a significant positive shift. General feedback from evaluators was that the Version 4 assessment tool was easy to use and could be used by other professions to evaluate the pharmacy students. Pilot testing across both P2 and P3 learning activities showed promise that the assessment tool could be used for measuring longitudinal development, though further validation would be necessary.

Table 1: Comparison of P2 Student Evaluation of IPE Assessment Tool Fairness, Ease of Use and Clarity

Criteria	Fall 2016 Semester: Version 2 Mean (std.dev)	Spring 2017 Semester: Version 4 Mean (std.dev)	p-value
Fair Assessment	3.30 (1.19)	4.12 (0.86)	<0.001
Easy to Use	3.65 (1.11)	4.48 (0.80)	<0.001
Clear to Follow	3.68 (1.04)	4.38 (0.71)	<0.001

CASE IMPLEMENTATION THEMES

Following the process of developing an assessment tool and the outcomes of pilot testing and obtaining feedback, the faculty have committed to broad implementation of this tool across the curriculum. However, the value of the process was not limited to the outcome. The workgroup identified three key themes that positively contributed to the success of the assessment tool's development: continuous refinement, collaboration, and streamlining. While these are a fit for this case, thoughtful extrapolation of these themes to related assessment efforts may also be helpful in advancing student-level and curricular assessment.

Continuous Refinement

During the development process, it was recognized that the assessment tool will need to be continually reviewed and evaluated. The balance between the ideal academic assessment tool to measure all of the IPEC Core Competencies and the ability to execute the assessment tool in practice was a continual challenge during development. It is necessary to develop assessment tools to give students guidance on expectations for their performance and to allow students to reflect in order to improve their performance over time.¹⁵ The workgroup worked through several versions ranging from very detailed to minimalistic to determine where the balance of the assessment should be. The workgroup recognized that there was the need for multiple reviewers and pilot testing to ensure that the assessment tool was valuable in terms of providing useful assessment data, while also meeting the needs of the students. In order to create valid assessment tools, the importance of incorporating input from stakeholders to continuously provide feedback to improve the tool cannot be understated.¹⁶ The comments that the workgroup received during the process were helpful. However, the need to continually gather both evaluator and student feedback over time is acknowledged, as it will likely lead to further refinement of the tool. The process of continuous quality improvement is critical especially with the constant change in the needs and characteristics of the students, as well as the dynamic changes in interprofessional practice.

The assessment of student learning outcomes was the primary aim of the assessment tool; however, the utilization of the assessment tool also serves to provide guidance to faculty

facilitating the various IPE initiatives. Furthermore, the development of the assessment tool has allowed faculty to evaluate the specific learning objectives of their learning activity and determine the appropriate assessment criteria for the students. This process has led to meaningful discussion about the IPE curriculum and not only the purpose of the learning activity, but also what is defined and measurable for the student.

Collaboration

This IPE assessment tool would not have the breadth and depth of use without collaboration from other stakeholders within and outside of FSU COP. Given that evaluators in the IPE learning activities are often faculty from other disciplines and universities, the assessment tool had to be easily understood by an interprofessional faculty audience. Additionally, ensuring that evaluation methods align with the FSU COP's assessment plan to meet the IPE curriculum objectives and ABOs were vital to the success of the assessment tool.

The process of developing these assessment tools included collaborating with various groups and people from within FSU COP, such as members of the assessment committee, the group developing the APPE assessment tools, and the director of assessment. Each group or person provided valuable feedback, in order to get from the starting point of a generic, skill-based IPE and non-IPE assessment tool to solely assessing IPE learning activities using the IPEC Core Competencies to where the assessment tool is today. Although the types of collaborators will vary between institutions, it is advantageous to bring these groups in to the discussion at multiple points in the process. The workgroup found it helpful to engage these stakeholders during early and main stages of assessment tool development, as well as during pilot testing. This will: 1) confirm that early ideas fit within a program's assessment plan, 2) provide feedback during the main stages of development, and 3) ensure the final product meets the institution's goals.

In an ideal world, a pharmacy faculty member would complete the assessment tool and provide individualized feedback to a student, who they were assigned to during an IPE learning activity. However, with a class size of approximately 150 per cohort and considering the practical realities of faculty schedules, it is difficult to give all students individualized

feedback related to an IPE learning activity, especially for activities that happen in real time. Fortunately, faculty members from other professions are generally present and could provide robust assessment, given that the final version of the assessment tool was clear to use.

An additional concern was that a team exclusively comprised of pharmacists developed the assessment tool and that they may be blind to areas of interprofessional practice that a non-pharmacist would better understand. Soliciting feedback from non-pharmacist collaborators is helpful in identifying areas of weakness in the assessment tools simply because they were developed exclusively by pharmacists. For others considering the development of an assessment tool, it may be beneficial to provide your assessment tool to colleagues outside of your institution to confirm that those outside the academic pharmacy world can provide assessment comparable to pharmacy faculty members. Those stakeholders may even point out flaws or offer suggestions for improvement.

Streamlining

Although collaboration is helpful for creating an assessment tool that is useful in multiple courses, practice settings, and points of progression within the curriculum, collaboration puts a team at risk of developing an assessment tool that is highly complex as each team member brings a unique contribution and perspective. On one hand, complexity can bring great amounts of data that could provide useful feedback, such as differentiating between and evaluating student performance with both receptive and expressive nonverbal communication. On the other hand, complexity can also make an assessment tool so difficult to use in a simulation or clinical setting that faculty may only partially fill it out, fill it out incorrectly, or discard it entirely. Therefore, careful consideration must be given to keeping not only the assessment tool, but the process and location of assessment, highly streamlined so that the assessment tool offers the greatest chance of providing useful data. The workgroup found that pilot testing was very helpful in determining how many fields of data were reasonable to obtain, and what complexity was possible within each field, given both faculty and non-faculty evaluators.

Once the reasonable amount of data was defined, a streamlined method to evaluate the assessment data was needed. ExamSoft® (ExamSoft Worldwide; Delray Beach, FL) had been used for general knowledge-based exams at FSU COP for two years. The “tagging” feature in ExamSoft® allowed mapping individual performance criteria within the assessment tool to different IPEC Core Competencies, ABOs, entrustable professional activities (EPAs), and associated skills. Mapping to this level of detail created utility in that student progression could be tracked in each of these areas. Additionally, students could view their own progression in real-time to understand areas where they still needed to further develop. While this may seem excessive, the workgroup found it helpful to understand

the level of proficiency that students had achieved at each competency level, so that specific gaps or weaknesses could be identified. These competencies represent different skills where deficiencies could exist, so it became critical to understand where specific issues were that either needed more emphasis or repetition of the concept at either a curricular level or an individual student level.

While this mapping process carries a great deal of up-front specificity during the assessment tool development process, the benefit is a tremendously streamlined process for both activity-specific and longitudinal assessment of students individually and in aggregate. Furthermore, the mapping of the learning activity only needs to take place when the activity is developed or revised. With appropriate mapping to learning outcomes, a warehouse of data is created to provide users with in depth analysis at both a programmatic and individual student level.¹⁷ Additionally, it does so without any of the traditional data entry compared to the paper-based assessment tools that were used historically.

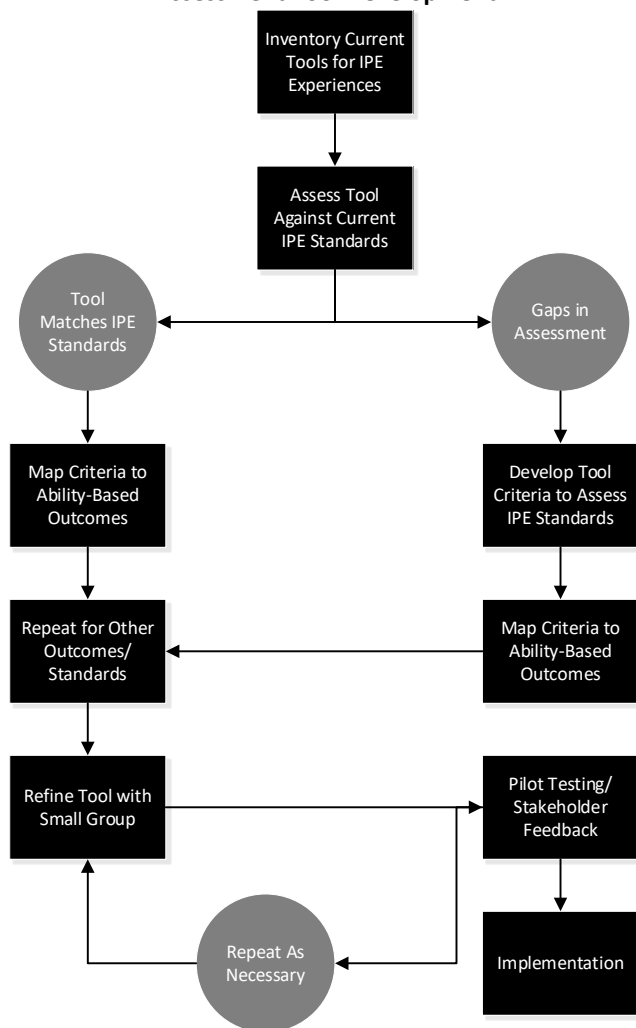
CASE IMPACT

Developing an assessment tool to standardize the evaluation of students during IPE learning activities has helped to: 1) bring greater consistency to the IPE learning activities across the curriculum, 2) map IPE assessment to each learning activity to ensure that curricular ABOs and IPEC Core Competencies are met, and 3) provide student-level and programmatic assessment data to help guide development and improvement.

There has been a shift to utilize a competency-based approach both for health professional education, in general, with the emergence of the IPEC Core Competencies,¹⁸ as well as the requirements of Standards 2016 for colleges of pharmacy. The National Center for Interprofessional Practice states that their number one expressed need is in the area of measuring IPE, selecting the right assessment tools and identifying the tools that are recommended.¹⁹ Overall, there is a need to develop assessment tools to evaluate and provide feedback on these competencies at the individual student level to ensure they are “team-ready” upon graduation.¹

Given that pharmacy programs are going to be at different stages with their IPE development, Figure 2 outlines a generic process that can be used when developing assessment methods for IPE. Programs can begin by taking an inventory of current assessment tools that are used, if any, and assess the assessment tool items for current IPE standards and/or learning outcomes. When meeting this criterion, mapping to the program’s ABOs can proceed. After mapping is complete, the assessment tool can be vetted within a small group, and then pilot tested before implementing as a standardized means of assessment.

Figure 2: General Process for IPE Assessment Tool Development



Next Steps

The initial assessment tool that was envisioned at the beginning of the process is significantly different than the assessment tool that was implemented. Questions still remain from an operational, as well as a curricular standpoint. For example, what is the best mechanism to provide formative feedback to students in a reasonable time period? Competency cannot be achieved in a singular encounter and no single tool will provide all of the data necessary to determine student IPE preparedness. The workgroup believes they have sufficiently scrutinized the final version of the IPE assessment tool through the process as described, and are comfortable implementing it into the curriculum to assess the subjective and complex skill of interprofessionalism.

It is uncertain if this assessment tool will garner a sufficient level of data for the students to develop professionally, but the workgroup hopes that two years of longitudinal data from multiple IPE learning activities each year will provide useful feedback for student development and programmatic improvement. The assessment tool will be utilized during the P2

and P3 IPE learning activities described earlier in the case. Using the four competency levels of unacceptable, novice, competent and proficient, the goal would be to having students at the level of competent or proficient at each item in the assessment tool before they start their APPEs. Individual and aggregate student data will be generated using the reporting features within ExamSoft®. The assessment tool can be a foundational starting point and is adaptable as the needs of the students and curriculum evolve. The assessment tool is best utilized during IPE learning activities when students can be directly observed on interprofessional teams and multiple IPEC Core Competencies can be assessed. Although this has not formally been tested with the IPE curriculum, the intent is that portions of the assessment tool could be utilized to assess certain IPEC Core Competencies rather than using the assessment tool as a whole.

The workgroup also plans to further evaluate the assessment tool by testing its validity and reliability during the IPE learning activities. Additionally, a training program on the assessment tool will be developed to ensure that it is used consistently between evaluators. Compared to medical education, there is a deficiency of literature on assessment tools in pharmacy education that report evidence of reliability; both pharmacy and medical education do not report on validity evidence routinely.²⁰ There is a need for pharmacy education to pursue psychometric evaluation of their assessment tools and evaluate the significance of those results.²¹ When this process is complete, the workgroup plans to publish the findings of the validity and reliability testing, as well as the assessment tool as a whole, for others to utilize for assessment of IPEC Core Competencies as they see fit.

CONCLUSIONS

The IPE curriculum at FSU COP has evolved over the past fourteen years and developing standard assessment tools to assess student learning outcomes was the next logical step not only to meet the requirements of Standards 2016, but to ensure the best possible feedback for student growth and programmatic improvement. In developing IPE assessment tools, key lessons were learned about continuous refinement, collaboration, and streamlining, which may be helpful for related assessment efforts beyond IPE. The intention is that others can learn from this assessment tool development process to more quickly and robustly achieve their assessment goals as a way to assist students to be more prepared for interprofessional practice.

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Appendix 1: Snapshot of IPE Learning Activity Assessment Tool Evolution

Version 1: Assessment Tool Based on AAC&U VALUE Rubrics

	Proficient 4	Competent 3	Novice 2	Unacceptable 1
Delivery (<i>posture, gesture, eye contact, expressiveness</i>)	Is compelling, appears polished, and exudes confidence	Makes the content interesting and comfortable	Makes the content understandable	Detracts from understanding

Version 2: Assessment Tool Based on IPEC Competencies and Sub-Competencies

IPEC Sub-Competency		Proficient	Competent	Novice	Unacceptable
CC6: Use respectful language appropriate for a given difficult situation, crucial conversation, or conflict.	Language (health care professional or patient level, less discipline-specific lingo)				
	Delivery (respectful posture, eye contact, appears engaged)				

Versions 3 and 4: Assessment Tool with Condensed Competencies and Clearer Performance Criteria

	Proficient	Competent	Novice	Unacceptable
Engagement	Proactively helps to create a positive team climate through verbal and non-verbal communication.	Actively supports a positive team climate through verbal and non-verbal communication.	Participates within the team in a way that is not a distraction, but does not positively impact.	Minimally participates in the team. Does not actively interact with the team in a positive or productive manner.