Title: Developing and validating a tool to measure the impact of Interprofessional Education for Collaborative Practice (IPECP) training on competency attainment in IPEC (Interprofessional Education Collaborative) competencies related to values, attitudes, perceptions, and knowledge acquisition using observable behaviors.

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Focused question: How do we measure the impact of Interprofessional Education for collaborative practice (IPECP) training on competency attainment of IPEC competencies related to values, attitudes, perceptions and knowledge acquisition using observable behaviors across a range of clinical learning environments and practice settings?

Background: The importance of interprofessional education (IPE) in improving collaborative care and optimizing health care outcomes has been well-established, with the World Health Organization (WHO) describing IPE as an essential strategy that must be incorporated for health care professionals to better serve their local population. 1 Following this WHO report, Interprofessional Education Collaborative (IPEC) established the mission "to ensure that health professionals are proficient in competencies essential for patient-centered, community and population-oriented, interprofessional, collaborative practice." 2 Systematic reviews have shown that interprofessional education and collaboration improves team member knowledge, fosters more positive attitudes around collaboration, increases adherence to recommended practice guidelines, and increases utilization of additional health resources, each of which may contribute

to improved patient outcomes.3-4 It is also clear that teamwork training, a major component of IPE, is associated with reduced adverse events, reduced morbidity and mortality, and improved patient care coordination.5

While the importance of interprofessional collaboration is clear, there is a gap in literature related to the impact of educational interventions in the clinical setting (as opposed to classrooms or simulated training). To address this gap, the pediatrics clerkship at Duke SOM implemented a unique learning activity that occurs in the clinical setting.Goals and objectives of this curriculum mapped to IPEC competencies 2 VE5, RR4, and TT2 are to improve student understanding of the roles and responsibilities of other providers and professionals, increase their appreciation of those various roles and responsibilities, recognize the need for collaboration with other health care professionals, correctly identify the appropriate health care professionals to collaborate and increase their understanding of the value of IPEC.

In a self-perception survey, the activity was associated with improvement in multiple domains related to understanding of roles, effective communication, respect, and team dynamics. Additionally, qualitative evidence shows improvement in student understanding of the value of collaboration and the importance of expertise other than their own. Our work was presented at 4 national meetings in 2023 (PAS, COMSEP, NEXUS, JCIPE) and scheduled for additional presentations in 2024 (PAS, COMSEP).

While this curriculum provides a method for implementing IPE in a clinical environment and shows positive impact based on a self-perception survey; we do not currently have a way to measure the impact of the curriculum on competency attainment related to values, attitudes, perceptions and knowledge acquisition, using observable indicators in clinical settings. Additionally, the presently available measures are context dependent (Valentine et al., 2015;WHO, 2013) limiting their application to a single study or small group of studies. Therefore, while the learning activity takes place in a clinical setting, we are still relying on a self-perception survey to determine effectiveness. Although there are many tools to measure collaboration, communication, and teamwork skills, there are fewer that measure observable behaviors which are evidence of IPEC competency attainment related to values, beliefs, perceptions and knowledge acquisition (including 2023 IPEC competencies VE4,VE5, VE7, RR1, RR3, RR4, RR5, C7, TT2). Of those that measure observable behaviors related to competencies mentioned ealier, many are vague or limited in scope. For example, the iTOFT assessment tool includes "Demonstrates respect for others in and outside the team" as an observable behavior with further item descriptors including "is polite and shows consideration" and "is kind, is mindful, appreciates." While these attempt to describe observable behaviors, in a competency-based education model, these descriptors are not measurable enough. Evaluators are left to interpret "kindness" and "consideration." Other tools, like the Interprofessional Collaborator Assessment Rubric (ICAR) rely on frequency measures like "occasionally," "frequently," and "consistently" without additional detail defining these frequencies. Given these gaps, observers must rely on subjective understanding of these terms, inter-rater reliability is at risk, and students may receive contradictory feedback. What if, on the other hand, there were a tool that delineated specific, measurable behaviors that could be used across a range of learning environments and practice settings specifically during clinical patient encounters as evidence of competency attainment in IPEC competencies of values, attitudes, perceptions and knowledge acquisition? Such a tool could provide quantitative insights into the impact of our curriculum, be utilized by others implementing IPECP curricula with objectives related to IPEC competency attainment in the areas mentioned earlier.

Specific aims: We aim to develop and validate a tool that could be used as evidence of competency attainment of 2023 IPEC collaborative competencies related to values, attitudes, perceptions and knowledge acquisition across a range of clinical learning environments and practice settings, using objective and observable behavioral indicators. These indicators will specifically identify what an observer should see and hear in a clinical space to assess and provide feedback to learners about their collaborative behaviors towards interprofessional collaboration across a range of learning environment and practice settings.

Methods: The process of tool validation involves ensuring that the instrument is reliable, valid, and accurately measures what it intends to measure. Here's how we would approach this:
Observable Indicator Development: Our first step would be to develop collaborative observable behavioral indicators as evidence of competency attainment through a process of focus group interviews of faculty, residents and learners from different health care professions (MD, PA, Nursing school). Interview questions will seek to identify observable and auditory indicators as evidence of competency attainment in competencies such as values, attitudes, perception and knowledge acquisition related to 2023 IPEC competencies (IPEC subcompetencies VE4,VE5, VE7, RR1, RR3, RR4, RR5, C7, TT2). For example, what would an observer see if a student appreciated other providers? What would an observer hear? What might this look and sound like during rounds or in the clinic? What might this look and sound like during other clinical encounters and in other learning environnments such as PA school, Nursing School or other practice environments such as IPE clinic of Duke SOM?
Tool Development: Based on behavioral indicators developed through focus group interviews, we will develop a tool that can be used in clinical observations to objectively measure collaborative behaviors related to values, attitudes, perception and knowledge acquisition. The tool may be a survey, observation checklist, etc., that includes items assessing the identified behavioral indicators.
Validation Process: Validation of the tool will first include feedback on the tool. The feedback process will be designed with the support of Duke Social Sciences Research Institute (SSRI) but will likely include feedback from both learners (across more than one learning environments), residents/fellows, and faculty (across different learning environments) to ensure that the indicators included in the tool as well as the instructions are reasonable, clear and important and that overall the tool is feasible and acceptable.
Inter-rater Reliability Training: Once the tool has been created, we will provide training to a small pilot group of observers to ensure inter-rater reliability using our tool. Training will likely include observing multidisciplinary rounds and IPE clinic to cultivate discussions about what was observed and how behaviors relate to indicators on the tool.
Pilot Testing: After Inter-rater reliability training, we will deploy trained observers to complete a number of observations. Details of this deployment will again be planned in conjunction with Duke SSRI to ensure effective testing.
Reliability Testing: We will assess consistency of results with support from Duke SSRI.
Validity Testing:We will assess content, construct, and criterion-related validity with support from Duke SSRI and will involve expert review and comparisons with established measures.
Observer Training: Once validity testing has been completed, we will train a larger cohort of observers (faculty and residents) who will use the tool in data collection on a larger scale to

further ensure consistency and reliability. We will provide clear instructions on how to assess and score each behavioral indicator based on results of pilot testing.

Feedback and Iteration: We will gather feedback from observers and participants regarding the tool's effectiveness and use this feedback to make any necessary adjustments and improvements to the tool.

Documentation and Reporting: We will document the entire validation process, including methodology, results, and any modifications made to the tool and prepare a comprehensive report summarizing the findings.

Dissemination: The validated tool and research findings will be shared through presentations, publications, or other relevant channels to contribute to the broader understanding of IPECP in clinical settings.

In a phase 2 of this study, we will use the tool to measure the effectiveness of our own IPECP curriculum and do a pre and post assessment on the tool for a wide range of learners participating in supervised clinical experiences at Duke Pediatrics (MDs, NP, PA, RN).

Outcome Measures:

Tool Validity: (As mentioned earlier)

Inter-rater Reliability:

Assess the consistency of results by providing inter-rater reliability training to a small pilot group of observers.

Pilot Testing Results: Collect data from pilot testing to evaluate the effectiveness of the tool in capturing observable behaviors. Document observer feedback on the clarity, feasibility, and importance of the tool.

Observer Training Success: Measure the success of training a larger cohort of observers to use the tool in data collection. Assess the consistency and reliability of data collected by the trained observers.

Pre and post-assessment scores to measure the impact of our IPECP curriculum- Analyze the data using appropriate statistical methods to determine the significance of observed changes.

IRB Status: Approved (Protocol #)

Challenges: Limited Time and Resources: The validation process can be time-consuming and resource-intensive.

Observer Training and Consistency: Training faculty and resident observers to ensure consistency in data collection.

Pilot Testing Logistics: Managing logistics for pilot testing, including scheduling, obtaining feedback, and making necessary adjustments.

Integration with Curriculum: Seamless integration of the tool validation process within the existing pediatric clerkship curriculum.

External Validity: Ensuring that the tool's validity extends beyond the specific pediatric clerkship context across multiple learning environments and practice settings.

Continuous Improvement: Establishing mechanisms for continuous improvement of the curriculum and the measurement tool.

Works Cited:

1.   World Health Organization (WHO). (2010). Framework for action on interprofessional education & collaborative practice. Geneva: World Health Organization.
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4.   Reeves S, Pelone F, Harrison R, Goldman J, Zwarenstein M. Interprofessional collaboration to improve professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2017 Jun 22;6(6):CD000072.
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Resource needs and budget:

Funding will be available for a 12-month period. Please fill in the table below and provide justification/description for each item below. Also, where requested, please provide an estimate of the time/effort you will expend on this project. PI support may not total more than 25% of the requested funds. Administrative support is available through "consultant costs."

	Description	Estimated Cost:
PI Support (no more than 25% of total funds requested)	<1 %	$500.00
Consultant costs	Support from Duke Social Science Research Institute (SSRI)	$ 6000.00
	Collaborators	$1500.00
	Observers (Faculty and Residents) for tool implementation and data collection: $30 gift card for each observation x 40 learners for pilot	$1200

Equipment		$
Computer		
Supplies		$
Travel		
Other Expenses	Meal/Snacks provision at IPE faculty training sessions	$800
Total Costs for proposed project:		$ 10000

Please provide a brief explanation below for each item listed in your budget template. Upload this document into the Qualtrics form when complete.